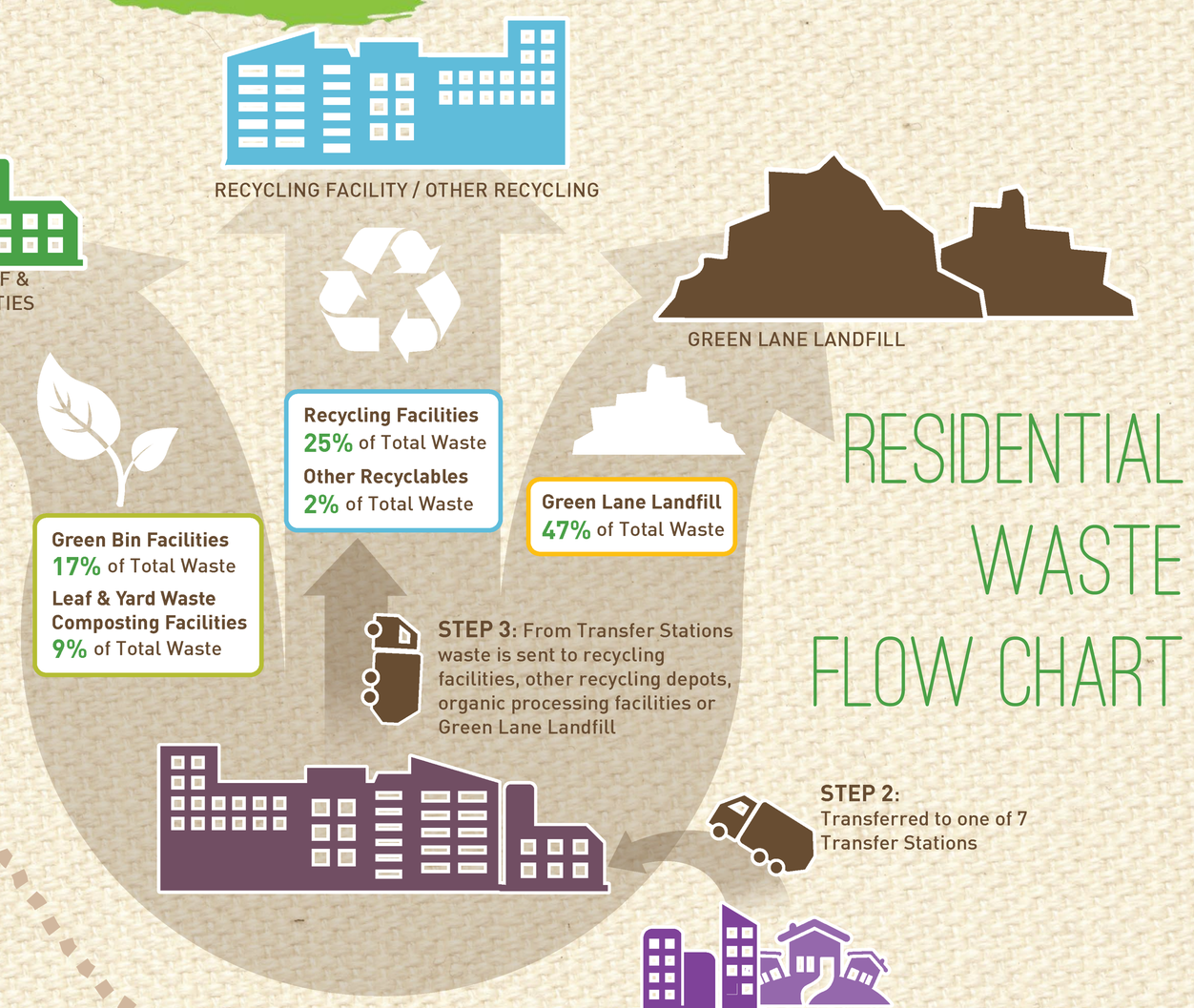
LONG TERM WASTE STRATEGY

STATION #3
PANEL 1

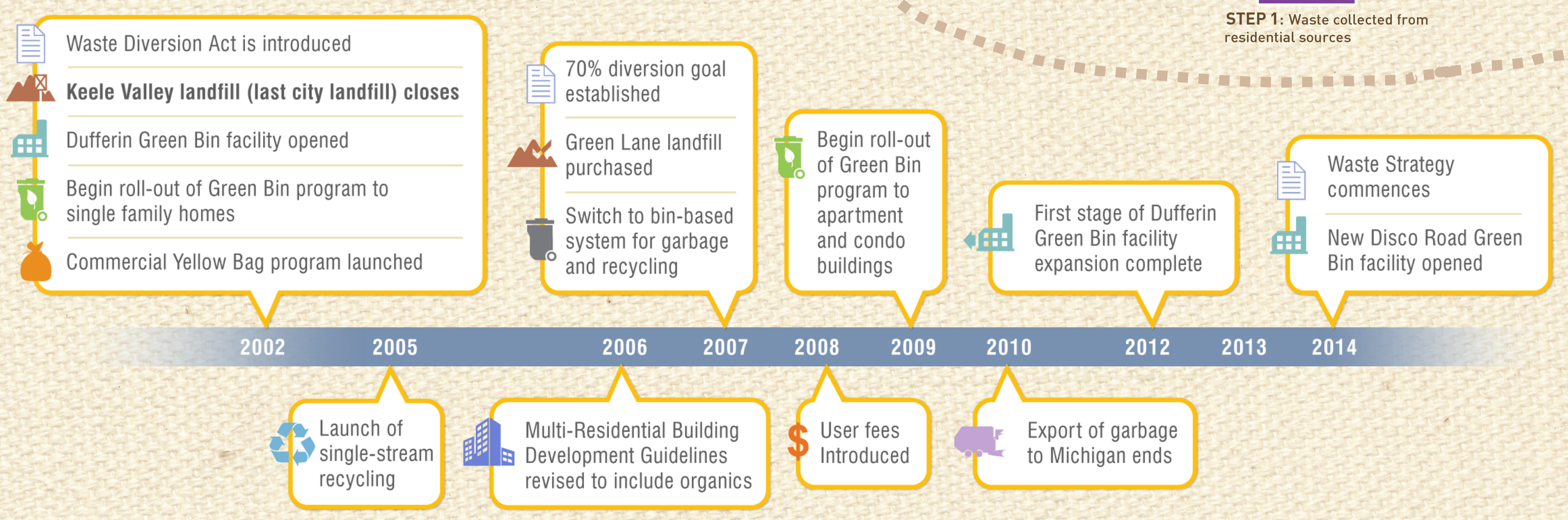
Overview of Current System

Toronto's waste management programs and policies date back over 100 years and have been changing ever since. The information presented here provides information on how waste is managed in the City of Toronto, the recent history of Toronto's waste management system and how Toronto compares to other large cities/regions.

RESIDENTIAL WASTE FLOW CHART



THE RECENT EVOLUTION OF TORONTO'S WASTE MANAGEMENT SYSTEM



DID YOU KNOW?

Toronto is a North American leader in Solid Waste Management among its peers! The City has a number of programs such as parks and public space recycling and curbside electronics collection which has contributed to greater diversion of items previously treated as garbage.

HOW TORONTO STACKS UP

	TORONTO (Pop. 2.6M)	METRO VANCOUVER (Pop. 2.4M)	NEW YORK (Pop. 8.3M)	CHICAGO (Pop. 2.7M)	BRUSSELS (Pop. 1.1M)	MUNICH (Pop. 1.4M)
SINGLE FAMILY RESIDENCES						
✓ Curbside Recycling	✓	✓	✓	✓	✓	✓
✓ Curbside Organics/ Green Bin Program	✓	✓	✓ *(pilot program)*		✓	✓
MULTI-FAMILY RESIDENCES						
✓ Recycling Program	✓	✓	✓	✓	✓	✓
✓ Organics/ Green Bin Program	✓ *(mandatory with City collection services)*	✓ *(varies among municipalities)*			✓	✓
RESIDENTIAL DIVERSION RATE	53% (2013 rate)	48%[1] (2012 rate)	15% (2013 rate)	12% (2013 rate)	23%[1,2] (2009 rate)	55%[1, 2, 3,4] (2012 rate)
PRIMARY SOURCE OF DISPOSAL	Landfill	Landfill and Waste-to-Energy	Landfill	Landfill	Waste-to-Energy and Landfill	Waste-to-Energy and Landfill

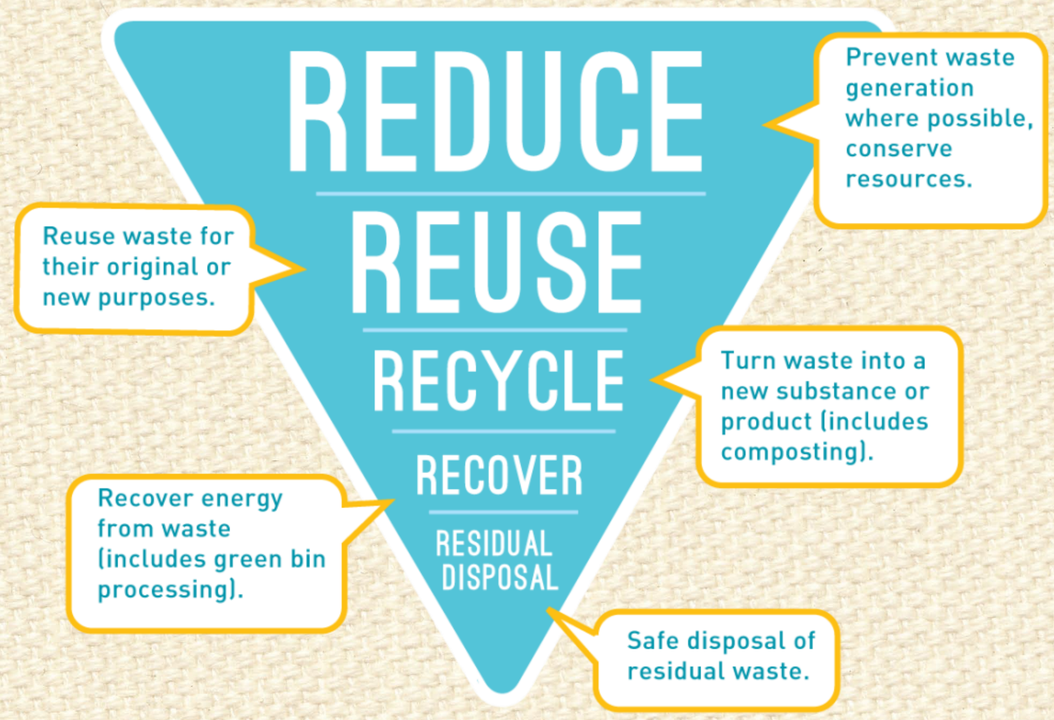
[1] Does not include waste sent to Waste to Energy facility
[2] Information presented is for comparative purposes only and is not a direct comparison as waste management practices are different in Europe compared to those in North American.
[3] Includes slag generated from Waste to Energy facility
[4] Diversion includes other materials not traditionally included in North American waste diversion calculations

TORONTO

Overview of Current System

THE WASTE HIERARCHY

The waste hierarchy reminds us of the order of importance when managing our waste. Priority is on reducing the waste we generate, then reuse, then recycle, then recover energy. We should exhaust the first 4Rs before we send any waste to disposal.



To find out where items go, check out **Waste Wizard** at **toronto.ca/recycle** or call 311

The City doesn't manage all the waste produced in Toronto. The City's main customers include homes, most apartment and condo buildings, some small businesses and schools.

The Waste Strategy will only focus on the waste produced by City customers.

DID YOU KNOW? If you have a certain amount of household hazardous waste like batteries, fertilizers, medications and light bulbs, you can call the **Toxic Taxi** for a FREE pick up from your home or apartment/condo building? In 2013, there were on average 17 calls per day for the Toxic Taxi and almost 175,000 kilograms collected!

Household Hazardous Waste examples include cleaning products (e.g., bleach), paints, motor oil, pesticides, batteries and medication. Visit the City's website for a more complete list.

Toronto's litter/recycling bins were designed to reduce litter and increase recycling in public areas. There are over **7,000** of these bins in the City, with more to come.

These litter bins have receptacles for cigarette butts! Cigarette butts make up a large part of Toronto's smaller litter items, they are harmful to the environment and can take up to 12 years to break down.

TORONTO

LONG TERM WASTE STRATEGY

PANEL 3

Reduce and Reuse

The most effective way to manage waste is to not create it in the first place. Many products can be used for different purposes so before throwing away items, think about how they can be reused. Reduction and reuse are the most effective ways to preserve natural resources, protect the environment, and save money!

HOW YOU CAN REDUCE WASTE

Plan ahead
Make grocery lists before shopping to reduce food waste or monitor food use to determine if changes to purchasing frequency are necessary.

Buy a travel mug
Bring it with you every time you buy coffee/tea – think of all the paper cups you'll save!

Reduce cleaning products
Have one cleaning product for multiple purposes. Consider environmentally friendly alternatives like vinegar, baking soda and lemon.

Avoid unnecessary printing
Consider the environment, don't print unless you have to. This includes emails, reports, tickets, bank statements, etc..

HOW YOU CAN REUSE WASTE

Reuse jars
Clean out jars and reuse as drink glasses, food containers or flower vases.

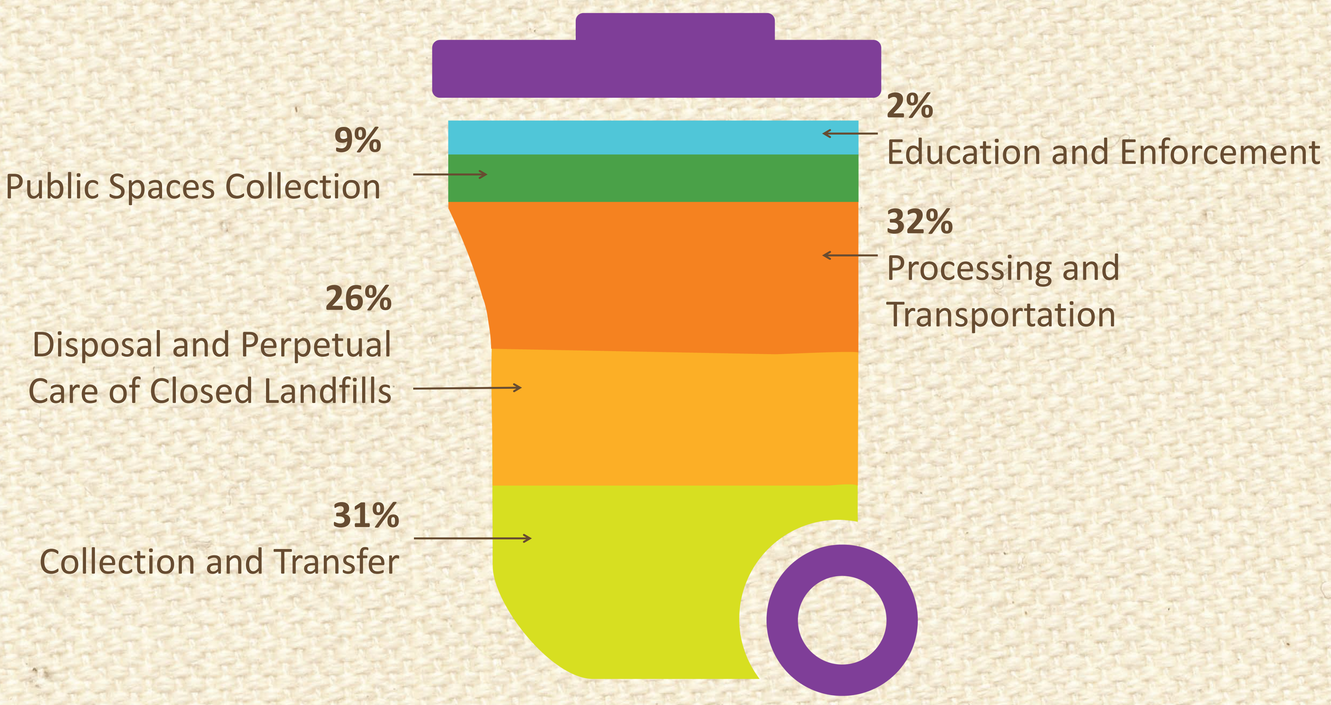
Reuse paint
Reuse old paint by finding things to paint in your home, touch up, or donate to local charities for their projects.

Donate items when possible
Give away gently used items or sell to a consignment shop. Consider purchasing second hand.

Reuse single-side printed paper
Print on the backs of used paper or make notepads. Use scrap paper or opened envelopes for shopping lists and reminders.

THE COST OF WASTE MANAGEMENT

The City's solid waste management division has an operating budget of almost $355 million for 2014. The graph below shows how this money is used to operate the City's waste management program.



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Even though we participate in the different collection programs, it still costs money to manage that material.
If we **reduce** and **reuse** waste, we will **decrease costs** and our **environmental impact**!

LONG TERM WASTE STRATEGY

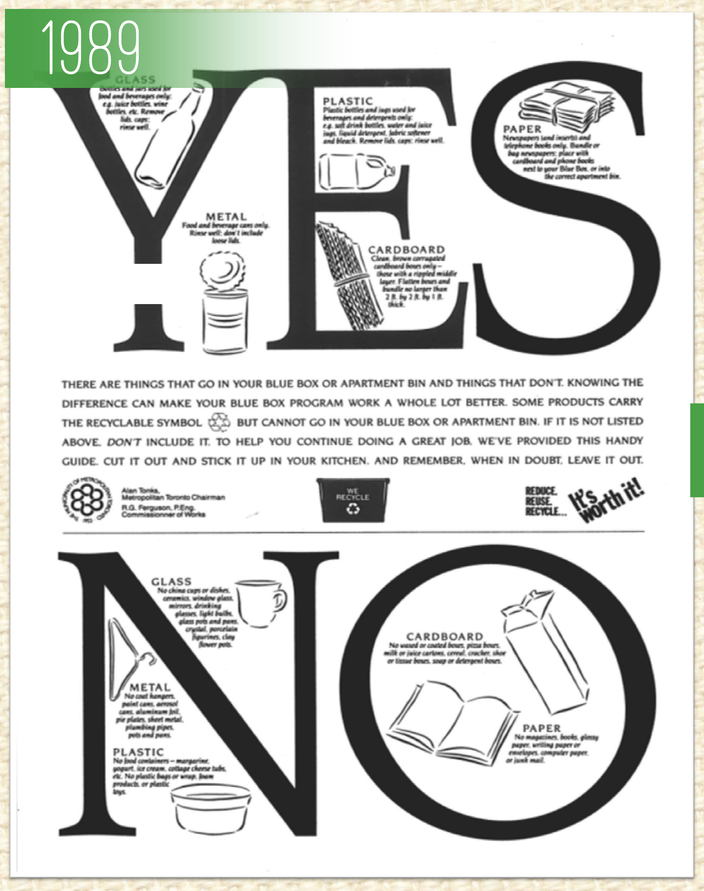
PANEL 4

Recycling Program

In Toronto, the Blue Box program has been in place since the late 1980's. Since this time, we have become use to the idea of recycling and now 96% of residents living in single-family homes in the City participate in the program. This panel provides information on our recycling program. Over time the nature of our waste has changed (e.g. much more plastics in our waste). The type of materials that can be recycled, the quantity, and the value of these materials has also changed. Change will continue and we must be flexible for our diversion system to keep up.

EVOLUTION OF THE BLUE BIN PROGRAM

1989



2014

Look at how the Blue Bin has evolved from a simple to a comprehensive collection program!

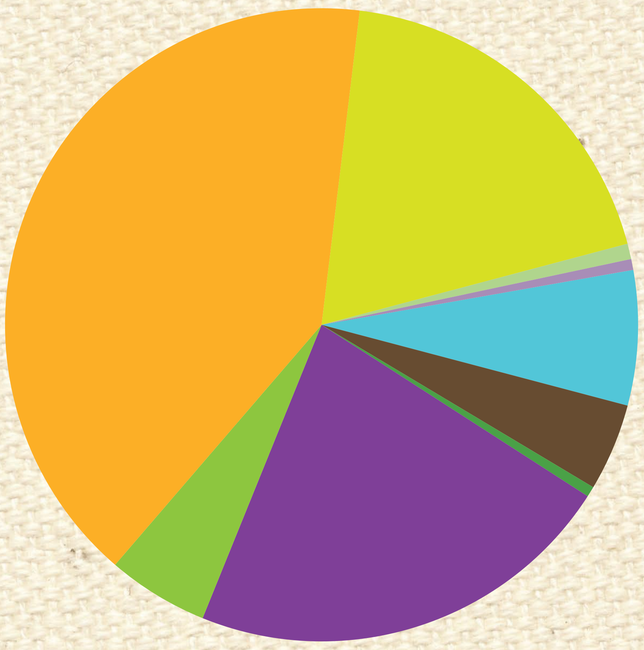
Implementation Timeline of the City Program

- 1988/1989: Recycling starts in Metro Toronto
- 2005: Switch to collecting all recyclables together; Plastic tubs and lid added
- 2008: Foam food and protective packaging, and plastic bags added
- 2012: Mixed Rigid Plastics (eg. clear egg cartons) added

2014 marks the 25th anniversary of Toronto's recycling program!

In addition to the Blue Bin Program, the City recycled 12,300 tonnes of other materials in 2013.

Here is the breakdown of the other materials



MARKET VALUE OF RECYCLABLES

Material	Value per tonne
Mixed Paper (newspapers, cardboard, office paper)	$
Polycoat (milk cartons, juice boxes)	$
Aluminum (pop cans, aluminum pie plates)	$$$
Steel (soup cans, paint cans)	$$
PET (water bottles, bakery trays, peanut butter jars)	$$
HDPE (shampoo bottles, laundry detergent)	$$
Plastic Film (plastic bags)	$
Polystyrene (Takeout containers, foam trays, white packaging foam)	-$$
Mixed Plastics (clear bakery trays, clear berry containers)	$
Mixed Glass	-$

DID YOU KNOW?

The City sells most of the Blue Bin materials which help offset costs of our programs. However, the City has to pay for some of the collected materials to be recycled.

$0 - $100	$
$101-$1000	$$
$1001	$$$

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LONG TERM WASTE STRATEGY

PANEL 5

Organic Waste Programs

Leaf and Yard Waste and Green Bin Programs

Almost 50% of the waste we generate comes from organic sources such as fruit and vegetable scraps, coffee grounds, soiled paper towels and tissues, diapers, pet waste, leaves, and branches. These materials can be turned into a reusable product: compost!

This panel gives information on what happens to the organic materials collected through the Green Bin and leaf and yard waste programs. Green Bin materials are collected all year round and leaf and yard waste is collected from March to December.

DID YOU KNOW?

The City gives away **FREE** compost made from collected Leaf & Yard Waste and Green Bin materials!

LEAF AND YARD WASTE

Step 5 Create Compost: Finished compost is given away to residents and used in other applications.

Step 4 Composting: Organic waste will decompose with air and moisture.

Step 3 Processing: Materials may be shredded into smaller pieces and placed into piles.

Step 2 Transportation: Leaf and yard waste materials go to composting facilities.

Step 1 Collection: Organic materials are collected.

GREEN BIN

Step 4 Composting: Solid organic material is sent to an aerobic composting facility for six months.

Step 3 Processing: Materials are put in a machine called a hydropulper which removes plastic bags and leaves a liquid organic pulp.

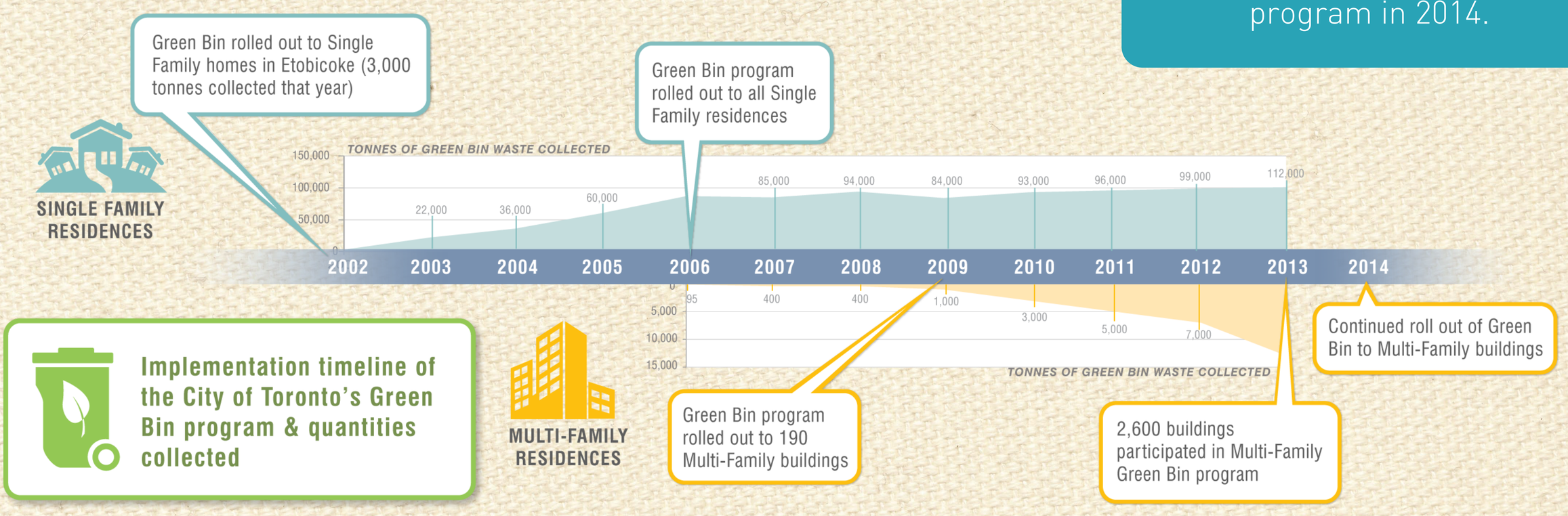
Pulp goes into another tank for 20 days, and through a process called anaerobic digestion is converted into a solid organic material and biogas (renewable energy source).

Step 2 Transportation: Organic materials go to Green Bin facilities.

Step 1 Collection: Organic materials are collected.

The Green Bin program is available to apartment and condominium buildings that receive City garbage collection (~ 4,500 buildings). In 2013, 13,000 tonnes of Green Bin organics were collected from the almost 2,600 buildings participating in the Green Bin program. The remaining 1,700 buildings will be brought on board to the Green Bin program in 2014.

The timeline below shows how the Green Bin program was phased in since 2002.



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Note: *Some apartment and condominium buildings (multi-family residences) have opted out of City waste collection services. Buildings that have City garbage collection services receive Blue Bin and Green Bin collection by the City.*

LONG TERM WASTE STRATEGY

PANEL 6

Organic Waste Programs

Green Bin Processing Facilities

Green Bin materials are processed at one of two City-owned Green Bin processing facilities.

HOW ARE GREEN BIN MATERIALS PROCESSED?

- The City uses a technology called *Anaerobic Digestion* to process Green Bin materials.
- Anaerobic Digestion technology uses microorganisms to break down biodegradable materials with no oxygen. The end result is compost and biogas, which can be converted to a renewable source of energy.
- Toronto's two Green Bin facilities (Dufferin and Disco Road) successfully divert thousands of tonnes of organics from landfill.
- Toronto is the only municipality in Canada that allows non-compostable plastic bags to be used in Green Bins and accepts harder-to-process items such as disposal diapers, sanitary products and pet waste.
- Benefits of this process include:
  - greater participation and convenience in the Green Bin program since plastic bags can be used (reduces the 'Yuck' factor); and
  - creation of compost as the end product which meets the strictest standards that is used on City parks.

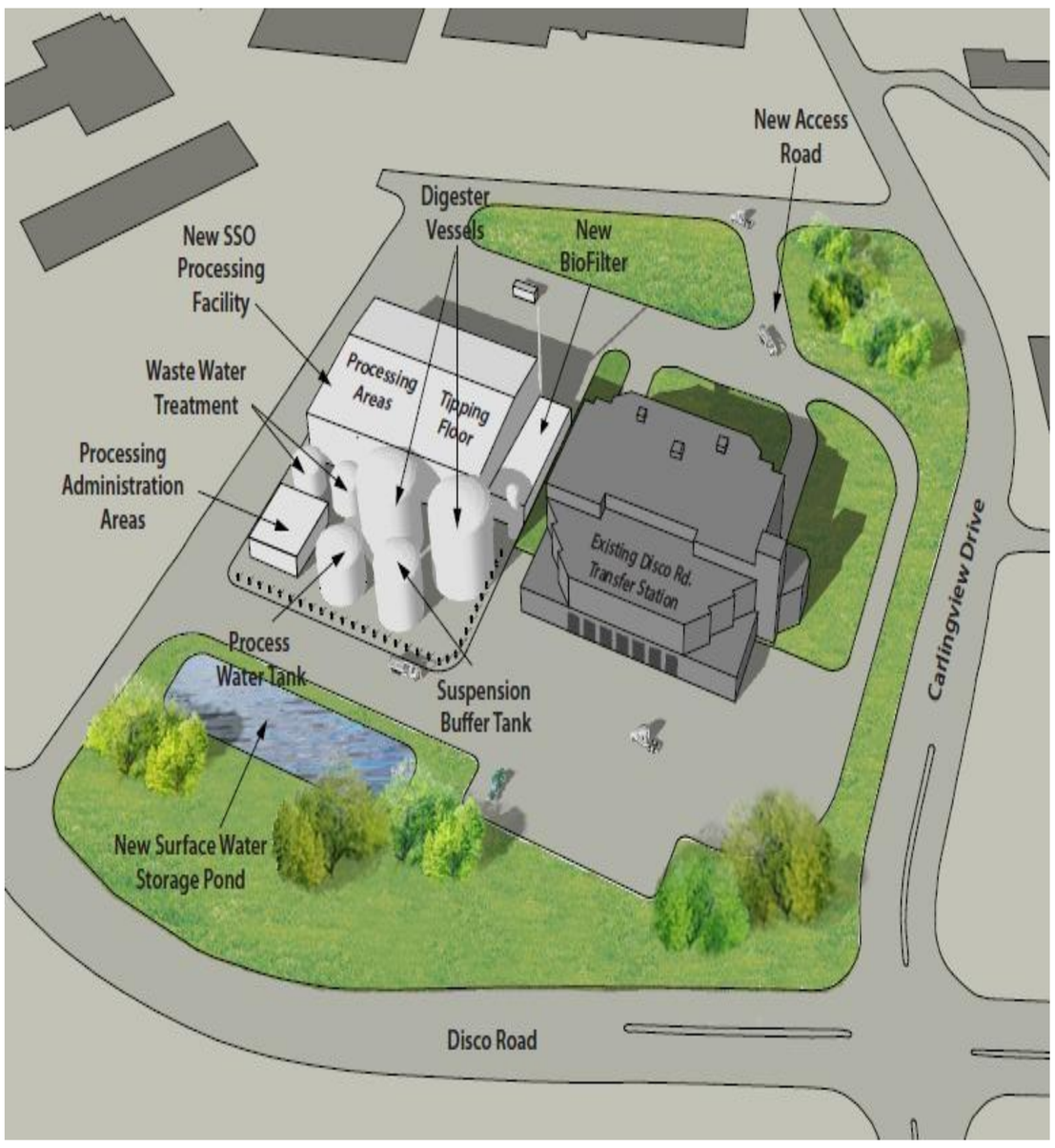
Toronto Green Bin

DUFFERIN FACILITY

The Dufferin Anaerobic Digestion facility opened in 2002 and was designed to process 25,000 tonnes of organics per year. It will be expanded to process 55,000 tonnes by 2017. Below is a picture of a hydropulper.

DISCO ROAD FACILITY

The Disco Road Anaerobic Digestion facility was recently constructed and is designed to process 75,000 tonnes of organics per year. Below is a diagram of the new Disco Road facility.



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The City is currently investigating opportunities to use the biogas that is generated from Anaerobic Digestion as an energy source.

LONG TERM WASTE STRATEGY

PANEL 7

Disposal

Where does your garbage go?

GREEN LANE LANDFILL

The Green Lane Landfill is located southwest of the City of London, about 200 km from downtown Toronto. The City purchased the Green Lane Landfill in April 2007. As of January 1, 2011, Green Lane became Toronto's primary waste disposal facility. The site's total approved area is 129.7 hectares (320 acres) and the disposal area is 71.2 hectares (176 acres). There is also about 800 hectares (2,000 acres) of land around the landfill to buffer the landfill from its neighbours.

The landfill is a state-of-the-art solid waste disposal facility that is compliant with Provincial legislative and regulatory requirements. It has on-site treatment of leachate and a methane gas collection and flaring systems. The Green Lane Landfill has been in operation since 1978. In 2006, it received provincial approval for expansion.

AERIAL VIEW OF GREEN LANE LANDFILL

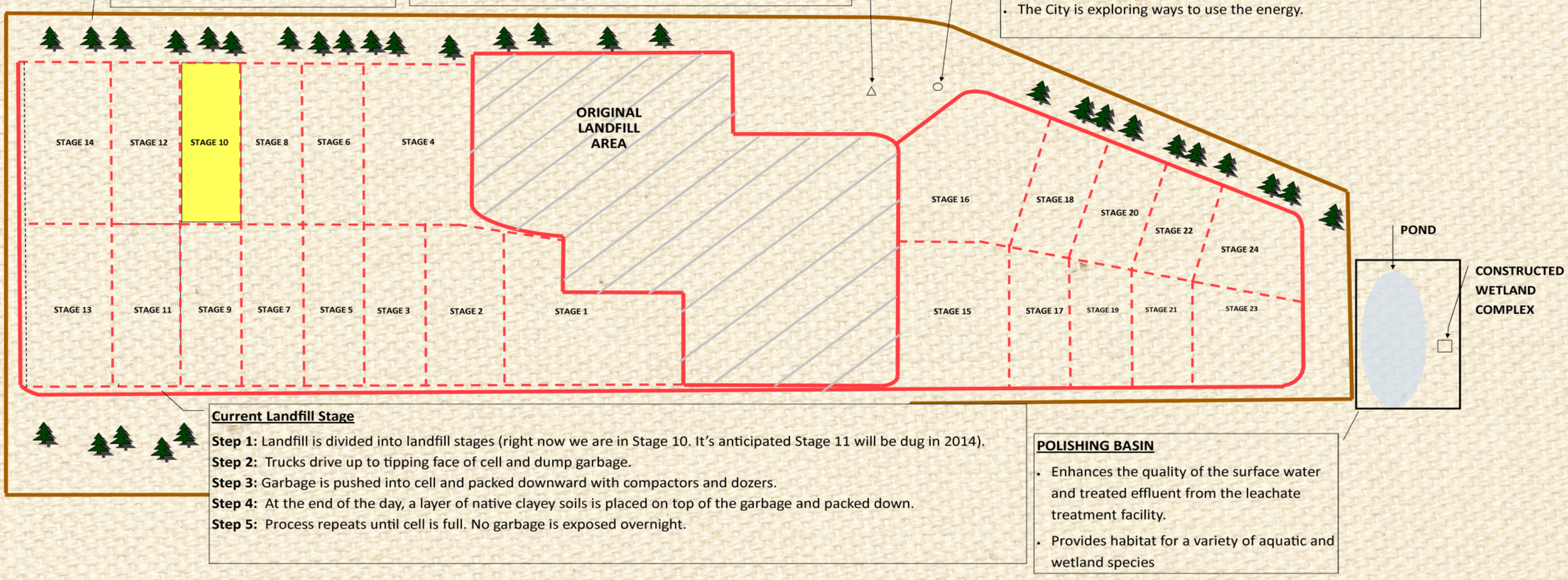
ONSITE LEACHATE TREATMENT PLANT

- Leachate is a liquid (usually sourced from rainwater) that moves through a landfill
- Leachate is collected at the bottom of the landfill and sent to plant by pipes
- Leachate is treated by settling and biological processes where bugs and bacteria breakdown the leachate
- Liquid is put through a sand filter for final cleaning
- Treated effluent joins storm water management ponds and a polishing basin. Effluent is tested throughout and when approved, it is discharged by force-main and gravity to a creek.

SCREENING BERMS: Vegetation planted to reduce noise and dust.

LANDFILL GAS MANAGEMENT FACILITY

- Landfill gas is produced when organic wastes biologically decompose
- Landfill gas is generally made up of methane and carbon dioxide
- Landfill gas is collected through a series of pipes and transported to the landfill gas management facility
- Methane is safely flared and reduces greenhouse gas emissions from the site.
- The City is exploring ways to use the energy.



Current Landfill Stage

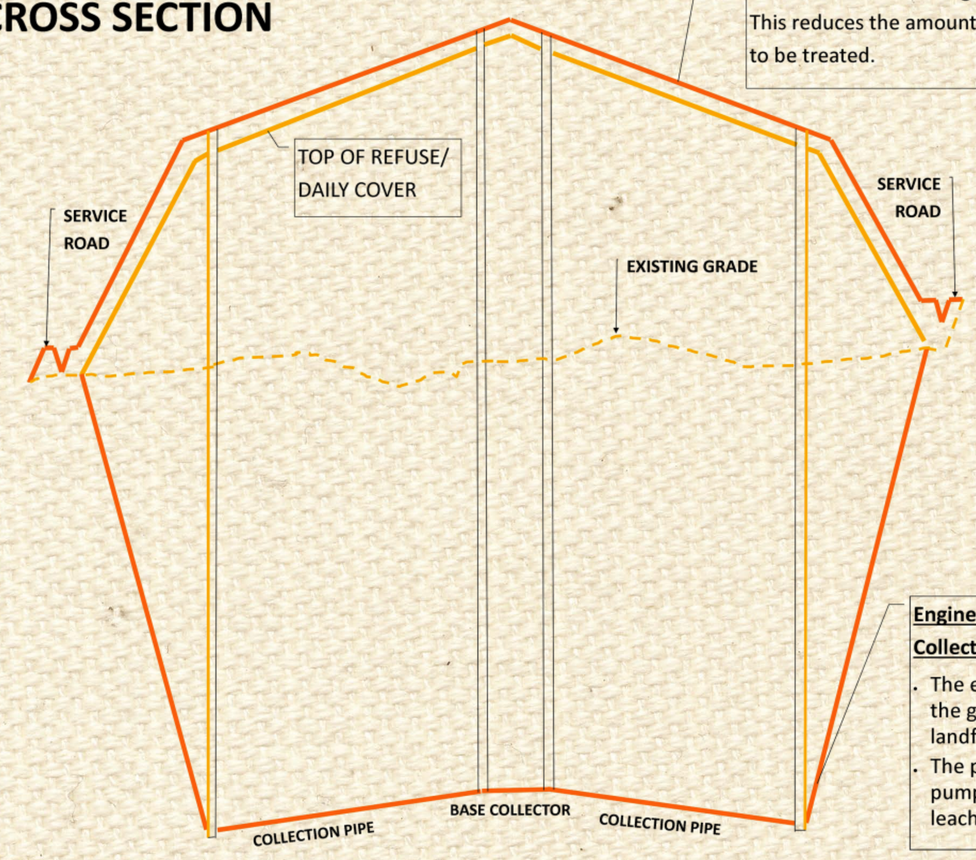
Step 1: Landfill is divided into landfill stages (right now we are in Stage 10. It's anticipated Stage 11 will be dug in 2014).
Step 2: Trucks drive up to tipping face of cell and dump garbage.
Step 3: Garbage is pushed into cell and packed downward with compactors and dozers.
Step 4: At the end of the day, a layer of native clayey soils is placed on top of the garbage and packed down.
Step 5: Process repeats until cell is full. No garbage is exposed overnight.

POLISHING BASIN

- Enhances the quality of the surface water and treated effluent from the leachate treatment facility.
- Provides habitat for a variety of aquatic and wetland species

LANDFILL CROSS SECTION

The top of the landfill surface is angled to promote rain and snow to run off instead of infiltrating the landfill. This reduces the amount of leachate to be treated.



Engineered Base and Leachate Collection Pipes

- The engineered base protects the groundwater underneath the landfill.
- The pipes direct leachate to pumping station and then to leachate treatment facility.

DID YOU KNOW?

The City pays for the continued care of more than **160 closed landfills?** Landfills require care for several decades after the site is closed. The money goes towards monitoring the groundwater and surface water and managing the leachate and landfill gas emissions.

TORONTO

LONG TERM WASTE STRATEGY

PANEL 8

Write down your ideas on how to REDUCE & REUSE more

REDUCE
REUSE
RECYCLE
RECOVER
RESIDUAL DISPOSAL

TORONTO

Tweet your ideas!

@GetInvolvedTO

#TOwastestrategy

LONG TERM WASTE STRATEGY

PANEL 9

What is the most common item you use that you wish you could recycle?

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Tweet your ideas!

@GetInvolvedTO

#TOwastestrategy