Where Does Our Waste Go?

A LOOK INTO TRASH & RECYCLING SYSTEMS

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The Problem

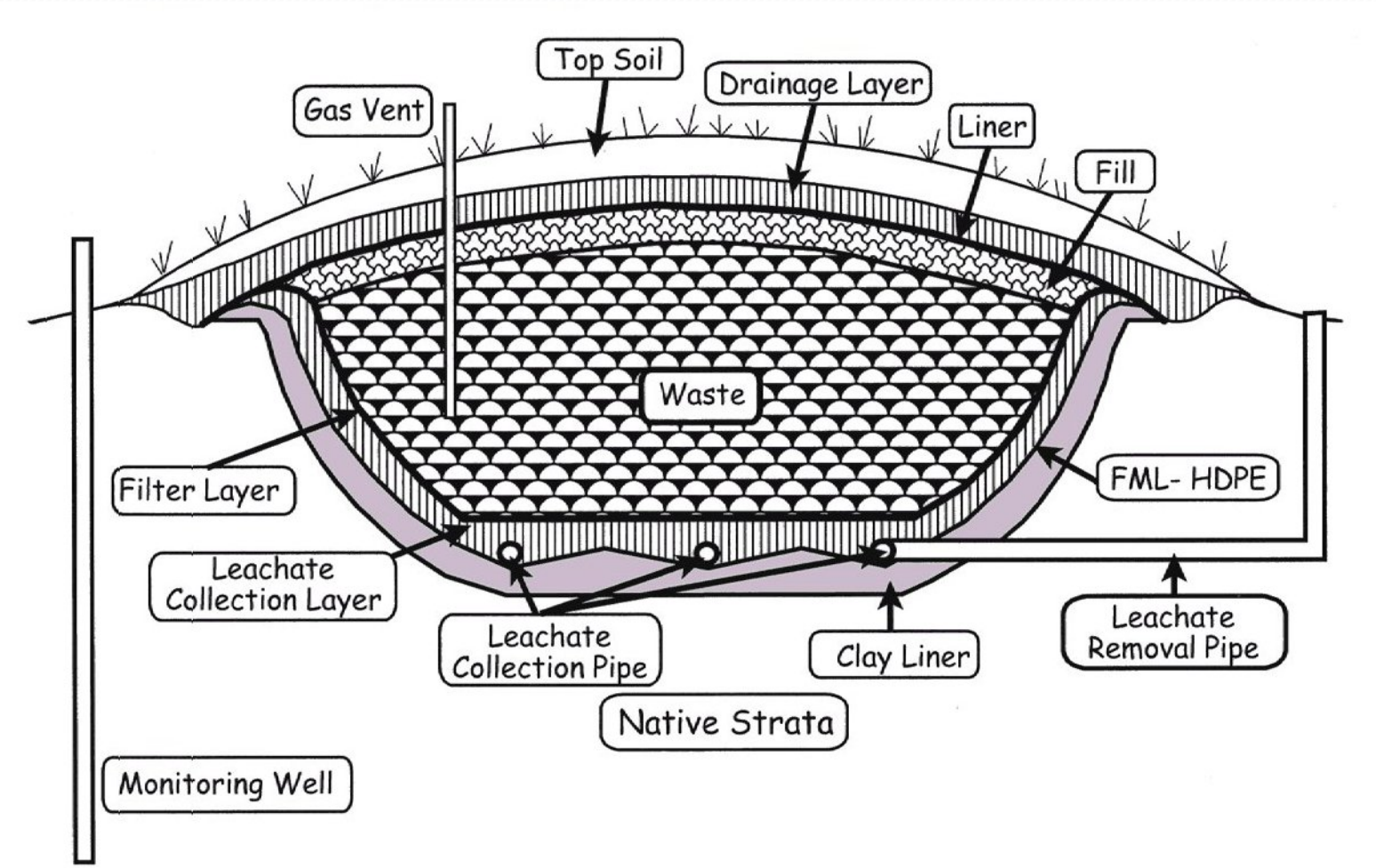
- The combination of a growing human population, a consumerist culture and a tendency to design single-use products has gotten us into serious trouble. Here are some trash statistics to paint the picture:
  - Americans generate 251.3 million tons of trash per year
  - Americans throw away 4/5 of a ton of trash per person per year
  - Much of this trash, while made to be thrown away, was designed to last a very long time.
    - Aluminum cans last 500 years
    - Glass bottle last 1,000 years
    - Plastic bottles last indefinitely
- On top of this consumption problem, much of the waste that we generate is recyclable, but instead ends up in a landfill.

Where does our Trash Go?

- When you throw your waste into a trash can, it goes to a landfill.
- A landfill is an excavated site or large piece of land that is specifically designed and built to hold waste
- Americans generated 251 million tons of trash in 2012. Only about 34.5% of this was recycled.
- Only 15% of Tulane's waste is recycled – we can do better!

Gentilly Landfill
Photo by David Grunfeld, *Times Picayune*

Cross-Section of a Modern Landfill



Landfill Safety

- There are many restrictions and regulations on landfills to lessen their impact on human health and the environment. Some of these include:
  - **Location restrictions** so that landfills are not built in unsuitable geological areas
  - **Composite liner requirements** to protect groundwater and soil from accidental leachate drainage
  - **Leachate collection and removal systems** to remove leachate from the landfill so that it can be treated and disposed of
  - **Operating practices** such as compacting and covering waste regularly with several inches of soil to minimize odor; control litter, insects, and rodents; and ensure public health and safety.
  - **Groundwater monitoring requirements** to determine if the landfill has released waste materials into the environment
  - **Closure and post-closure care requirements** including long-term monitoring of closed landfills
  - **Corrective action provisions** for the case of a landfill gas or leachate accident
  - **Financial assurance** to ensure that there is funding to carry out these regulations

Landfill Dangers

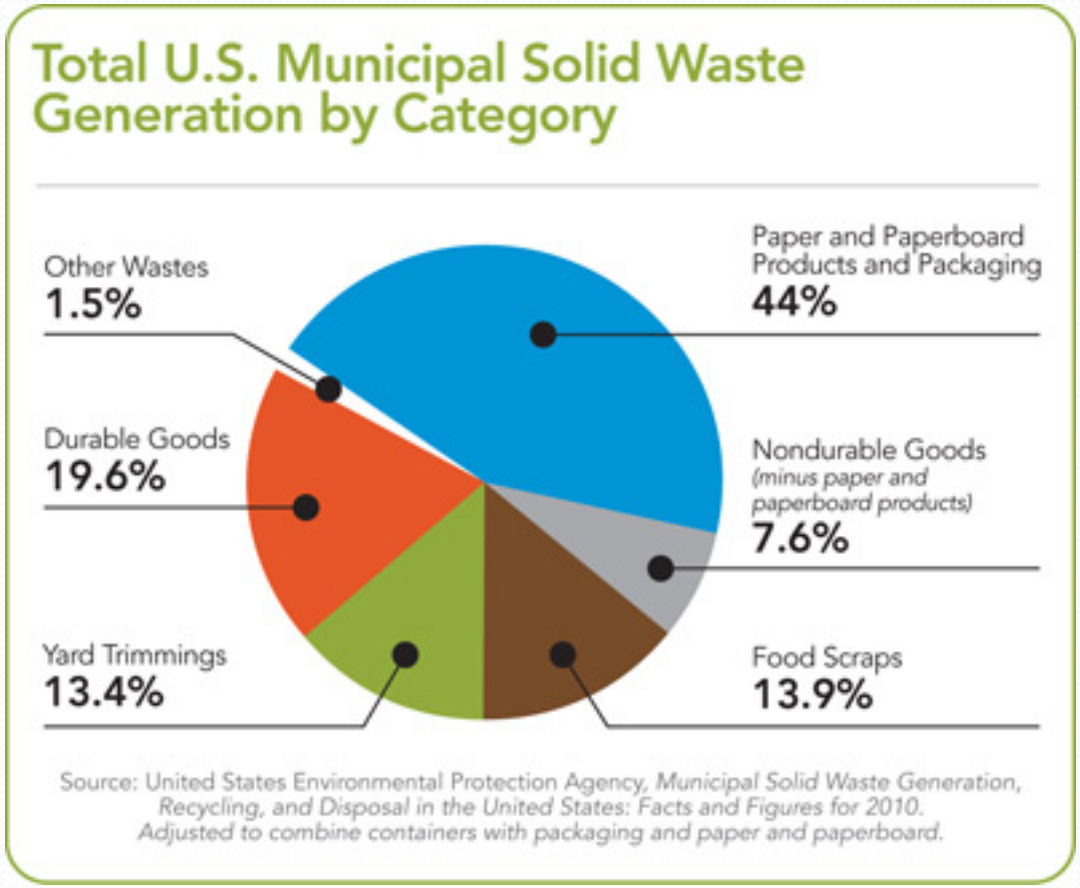
- Despite regulations on landfills, sometimes accidents do occur that can jeopardize both human and environmental health. The two primary safety concerns with landfills are:
  - **Leachate** – liquid that has been in direct contact with solid waste.
    - Leachate has high concentrations of organic contaminants and ammonia.
    - Toxic substances may be present in varying concentrations depending on the composition of solid waste
    - Fresh leachate can have pathogenic organisms in it
    - Leachate is collected in pipes and delivered to a waste water treatment plant. However, if the landfill leaks, it can **contaminate groundwater**, which can harm both the environment and human health.
  - **Landfill gas** – generated when bacteria decompose organic material in the landfill
    - Composed of roughly 50% methane and 50% carbon dioxide and water
      - Contains small amounts of nitrogen, oxygen, hydrogen, nonmethane organic compounds, and inorganic compounds
    - If landfill gas escapes, the greenhouse gases that it contains can contribute to climate change.

The Monetary Value of Our Waste

Source: As You Sow

About 43 million tons of plastic, glass, metal, and paper packaging are put in a landfill or burned in the U.S. each year. This waste has a market value worth approximately $11.4 billion.

The Composition of Our Trash



Getting your priorities straight

In a world where trash is building up, there are certain measures that we can take to mitigate the problem. Follow these simple steps to reduce your impact on the environment:

1) **Reduce:** The top priority is to buy and use less to begin with. It's important to ask yourself: "Do I really need this?"
2) **Reuse:** Before you dispose of that plastic soda bottle or shopping bag, see if you can reuse it a few times.
3) **Recycle:** If you've used a product so many times that it is no longer useable, check to see if it is recyclable instead of throwing it in the trash.

Why Recycle?

- Recycling allows us to:
  - Save natural resources like timber, water, and minerals
  - Send less waste to landfills and incinerators
  - Prevent pollution by reducing the need to collect new raw materials
  - Reduce energy usage
  - Create well-paying jobs in the recycling and manufacturing industries in the US
  - Reduce greenhouse gas emissions that contribute to climate change
  - Sustain the environment for future generations

Tulane Recycling Guidelines

It is always preferable to recycle your waste rather than throwing it away. However, it can be confusing to determine what is recyclable and what is not recyclable. Here's all you need to know to recycle correctly at Tulane:

Recyclable	Not Recyclable
Plastic with Resin Codes # 1 & 2 • Plastic bottles	**Glass**
Aluminum cans	Waxy paper
Paper	Pizza boxes with grease on them
Cardboard	Plastic grocery bags

PLASTIC RESIN CODES

1 PETE	2 HDPE	3 V	4 LDPE	5 PP	6 PS	7 OTHER
Polyethylene Terephthalate	**High Density Polyethylene**	**Vinyl**	**Low Density Polyethylene**	**Polypropylene**	**Polystyrene**	**Other**
soda bottles	milk, water and juice jugs	clear food packaging	bread bags	ketchup bottles	meat trays	ketchup
water bottles	detergent bottles	shampoo bottles	frozen food bags	yogurt and margarine tubs	egg cartons	3 & 5 gallon water bottles
shampoo bottles	yogurt and margarine tubs		squeezable bottles (mustard, honey)		cups and plates	some juice bottles
mouthwash bottles	grocery bags					
peanut butter jars						

Life after the blue bin

- After recyclables are collected, they are shipped to a recovery facility where they are sorted and baled.
- They can then be sold for manufacturing purposes. Just as there is a market for raw manufacturing materials, there is also a market for recycled manufacturing materials.

Photo from MLM in Greenwhich, CT

A Closer Look at the Recycling Process

- **Aluminum:**
  - Scraps are ground and shredded into small chips → chips are melted and cast into ingots → ingots are shipped to manufacturing plants where they are molded or rolled into sheets
  - Aluminum recycling saves 64,3000 kWh per ton of reclaimed material. This process is 96% efficient, making aluminum the most beneficial material to recycle.
- **Plastic:**
  - Plastics are sorted (not all plastics can be recycled) → plastic is shredded, baled, or chipped → shipped to reprocessing plant where it is melted or remolded into new products
  - Recycling saves 90% of the manufacturing process energy needed to produce new plastics.
- **Cardboard:**
  - Corrugated cardboard is pulped → blended with new pulp from wood chips → screened, rolled, and dried into two types of cardboard (the inner layer and smooth outer layer) → cardboard is sold to a box-board plant where it is formed into new corrugated cardboard
  - Recycling one ton of cardboard saves three tons of wood pulp

Happy recycling!

Sources

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