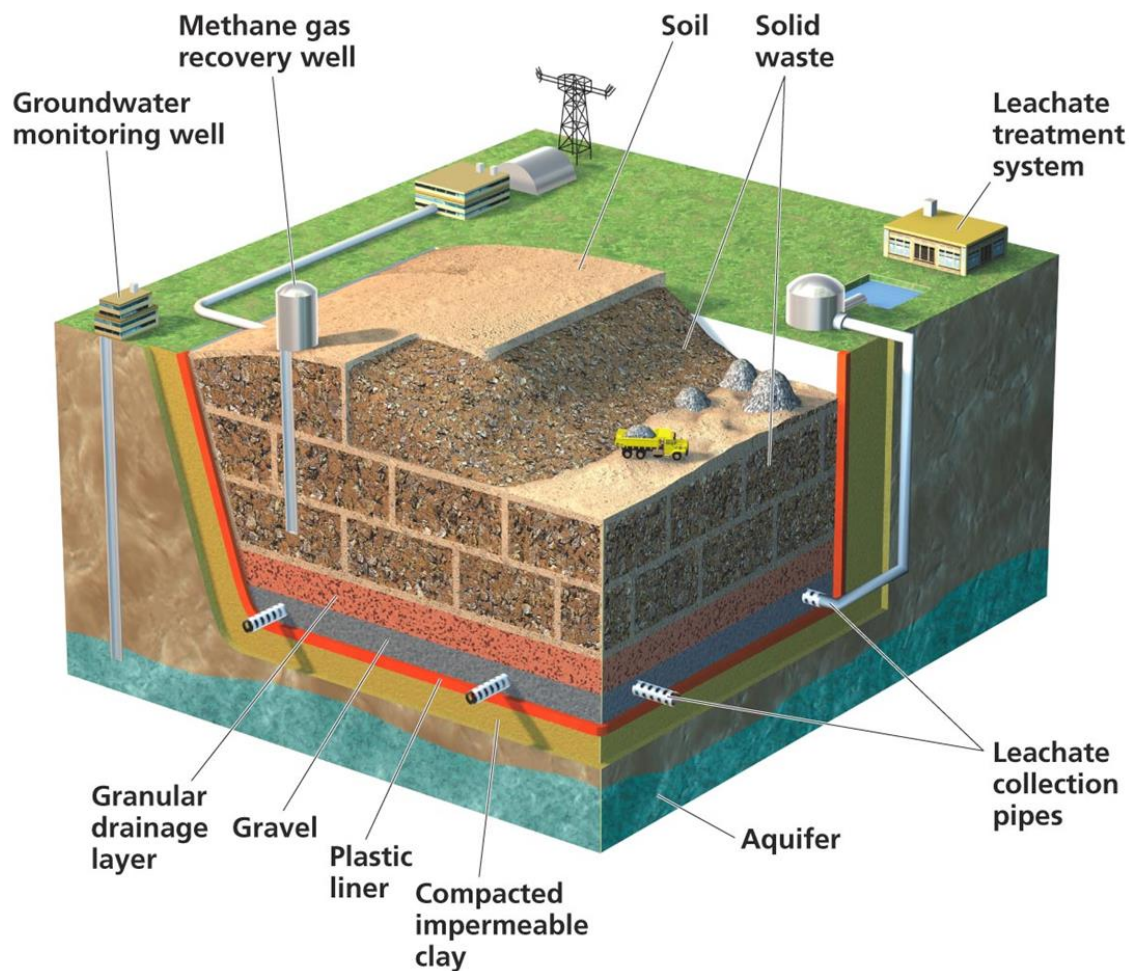
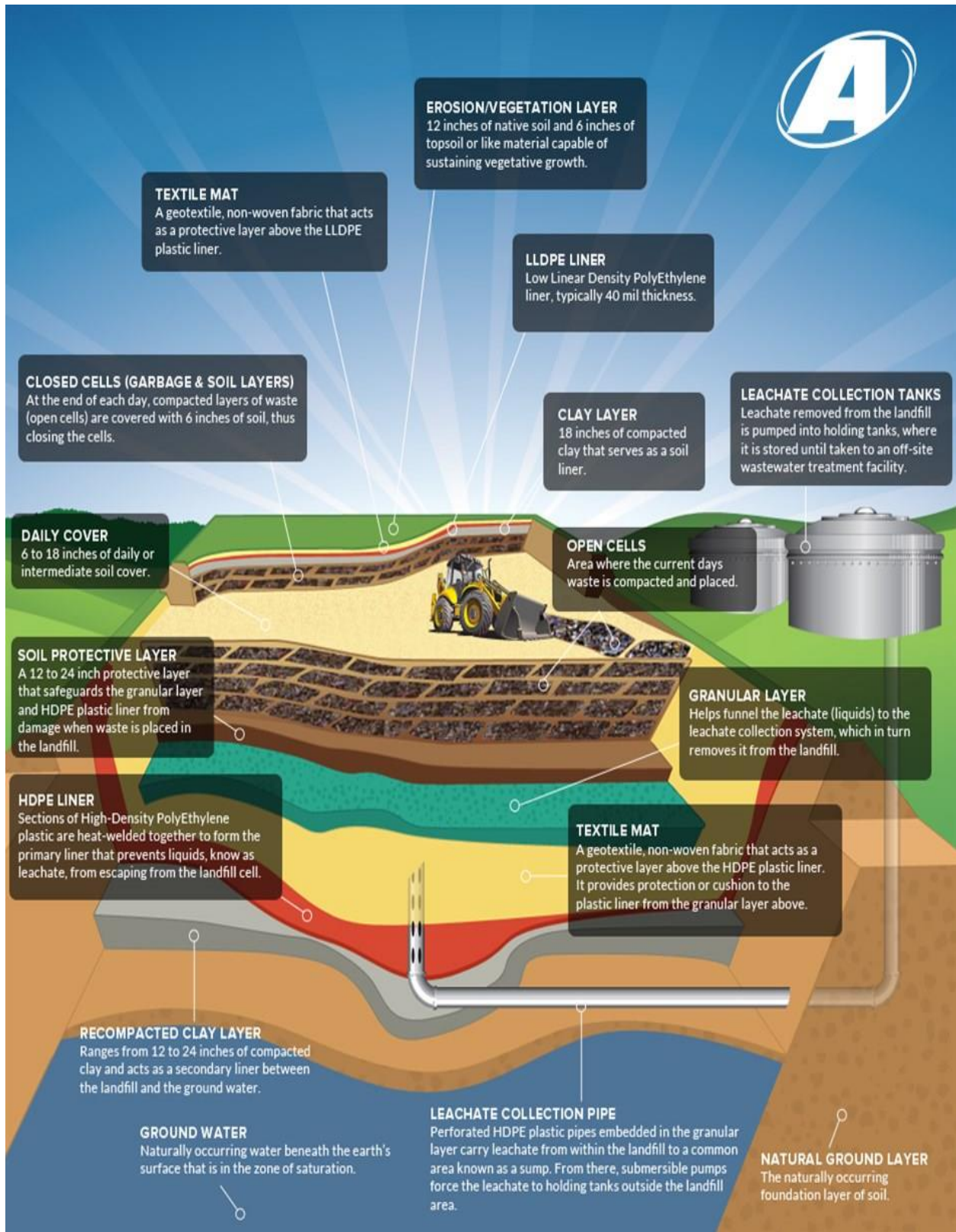


Landfill

A landfill site is a location that has been prepared for the purpose of dumping waste, rubbish or debris. Before the land is used to store waste, diggers are used to give it a suitable shape and it is covered with an artificial water-resistant coating to prevent the rubbish from contaminating the soil. The law states that landfill sites must be located away from inhabited areas, as well as areas used for farming or drinking water.

In modern **sanitary landfills**, waste is buried or piled up so as to avoid contamination of the environment.





Why are landfill sites so harmful to the environment?

1. Landfill are one of the causes of climate change

Landfill sites are partially responsible for global warming as they generate and release biogas into the atmosphere. Biogas is a mixture formed primarily of **methane gas** (CH₄) and **carbon dioxide** (CO₂), two of the gases that cause climate change and an increase in the planet's temperature. According to the ISWA report, if the current situation continues and we do not take action, landfill sites will **account for 10% of greenhouse gas emissions by 2025**.

2. They can cause fires or explosions

Sometimes **methane produced by waste from landfill sites can cause explosions and fires**. This downside is more common than meets the eye, because the fires that occur are not regular fires with flames, but fires that **occur inside the landfill**. Dioxin emissions from these spontaneous uncontrolled fires are also very harmful to the environment, not to mention the damaging effects they have on aquifers, whose waterproofing membranes are affected by the fire.

3. They can contaminate soil and water

Landfill sites are often responsible for the **contamination of soil and groundwater**, as the contaminating materials (such as heavy materials like lead and mercury) that the stored waste may contain can spread to the soil and water near the plant.

4. Landfills reduce the value of the surrounding areas

The **bad smells that emanate from landfill sites** cannot be effectively controlled and, almost inevitably, reach nearby populations. Property prices are reduced in areas located near to these waste stores, which further perpetuates the devaluation of disadvantaged areas.

Advantage and Disadvantage of Landfill

Advantages of Landfills

1. Landfills are an Excellent Energy Source
2. Modern Landfills are Eco-friendly
3. Keep Cities, Towns, and Districts Clean
4. Keeps Hazardous Waste Segregated
5. Landfills are Cheap
6. Landfills Support Jobs and Local Business

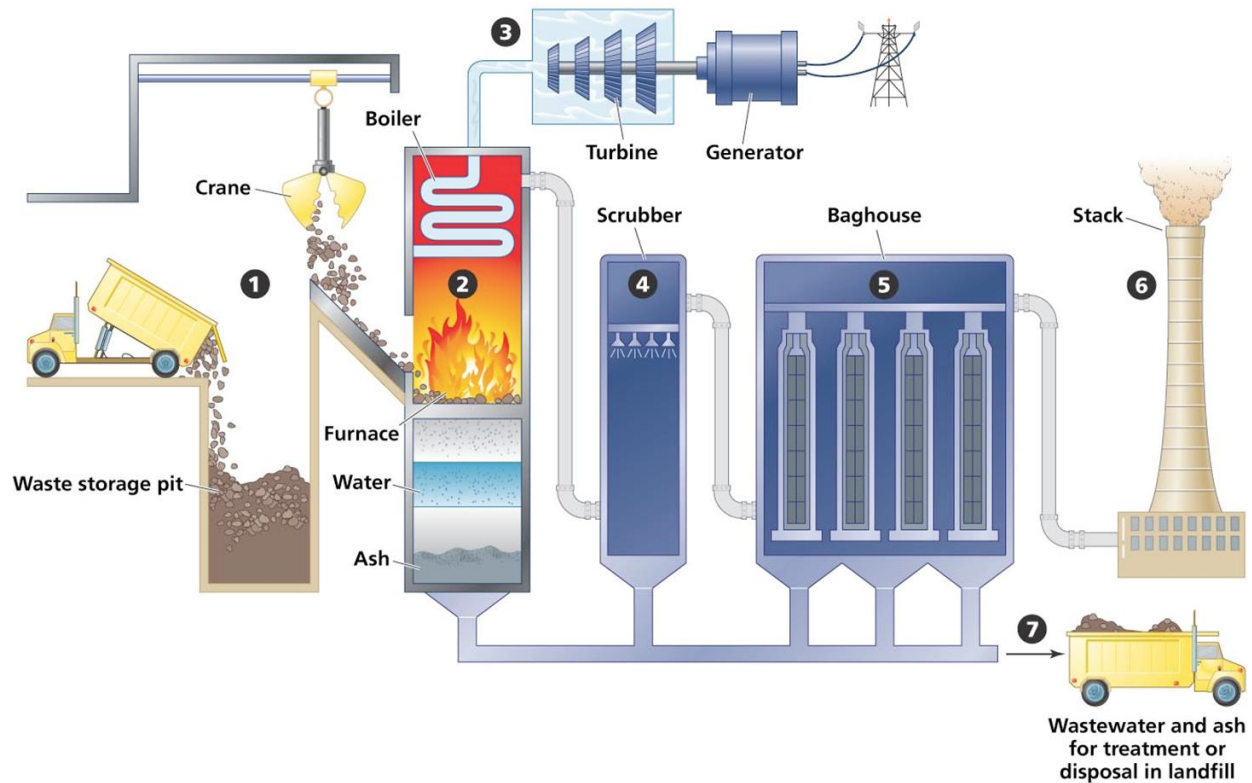
Disadvantage of Landfills

1. Landfills are Partially Responsible for Climate Change
2. Methane Lights up Easily
3. Contaminate Soil and Water
4. Landfills Affect Wildlife
5. Accidents Can Happen
6. Landfills Affect Human Health

Incineration

Incineration is the process of burning waste. Most incineration facilities use the resulting heat to generate a small amount of electricity, and industry refers to them as waste-to-energy (WTE) facilities. Most commonly, incinerators burn mixed municipal solid waste that includes plastic waste, but sometimes waste is pre-treated or sorted to reduce moisture content or the amount of hard-to-burn materials like electrical appliances. In simpler terms, waste Incineration involves converting waste materials into ash, flue gas, and heat.

- A controlled process of burning mixed solid waste at extremely high temperatures
- Reduces volume by 90%
- Remaining ash disposed of at landfill
- Better than open-air burning, but...
- Can create new chemical compounds and emit toxic chemicals from the stacks
- Popular opposition to incinerators because of pollution



Advantages and Disadvantages of Waste Incineration

Advantages of Waste Incineration

1. Reduced Quantity of Waste

Incinerators have the capability to reduce the overall quantity of waste by up to 95%. Additionally, they can decrease the solid volume of the original waste by approximately 80-85%, which may vary depending on the specific components present in the solid waste.

2. Efficient Waste Management

Incineration plays a vital role in making waste management easier and more efficient. This process can burn up to 90% of the total waste generated and sometimes even more.

3. Production of Heat and Power

Other than reducing quantity of waste and making the entire waste management process a breeze, incineration plants generate energy from waste that can be used to generate electricity or heat.

4. Reduction of Pollution Compared to Landfills

Research has shown that solid waste incinerators are less likely to pollute the environment than landfills.

5. Better Control over Odor and Noise

Waste incineration plants emit less foul odor than landfills because instead of letting waste decay in the open air, which contributes to air pollution, waste gets burnt inside a facility where the byproducts of the incineration process can be controlled.

6. Prevents the Production of Methane Gas

The decaying of waste in landfills produces significant amounts of methane, which is a big contributor to global warming.

7. Eliminates Harmful Germs and Chemicals

The very high temperatures used by incineration plants destroy harmful germs and chemicals in processed waste. It is thus a very effective method for eliminating clinical waste.

Disadvantages of Waste Incineration

1. High Operating Costs

Installing a waste incineration plant is expensive, mostly due to the expensive infrastructure and equipment needed to build an incineration plant.

2. Significant levels of pollution

While waste incinerators produce significantly fewer pollutants compared to landfills, they still contribute a considerable level of pollution, especially to the area immediately around them.

The smoke produced during the burning process may include acid gases, including but not limited to the carcinogen dioxin, particulates, heavy metals, and nitrogen oxide. These gases are poisonous to the environment.

3. Health and Environment Risk

waste incineration plants are built are at a higher risk for long-term negative health effects such as cancer, birth defects, reproductive dysfunction, neurological problems, and other health effects that are known to occur at very low exposures to many of the metals, and pollutants released by incineration facilities.

Respiratory problems, increased cancer rates, reproductive abnormalities, and other health effects are common in areas where incinerator plants are built. The leftover ash contains several poisons and heavy metals which require further treatment. If not disposed of correctly, it can cause serious harm to the public and the environment.

Incineration or Landfill, Which is better?

When we compare the overall impact of incineration plants on the environment to landfills, incineration still seems to be a “second-best” solution, much superior to traditional landfills

The waste incineration method, however, is less feasible in developing countries. A high proportion of waste in developing countries is composed of kitchen scraps that are organic waste and are composed of higher moisture content (40 to 70 percent) than waste in industrialized countries (20 to 40 percent).

This makes the waste from developing countries more difficult to burn. Ideally, organic wastes should be composted and utilized to enrich the soil in sustainable agriculture systems.