

**CAREER
PATHS**

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ENVIRONMENTAL ENGINEERING



Express Publishing

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open dump

WASTE MANAGEMENT

The Good and the Bad

Waste management is critical for human and environmental health. Without proper waste management, people would just throw garbage in **open dumps**. Fortunately, many places have better ways to handle waste. However, even the best facilities face challenges.

Liquid **hazardous** waste is often stored in **surface impoundments**. However, these can leak and contaminate groundwater. Fumes may also add to air pollution. A better solution is **deep-well disposal**. This method is permanent and environmentally sound if managed properly.

Solid waste landfills are sites that handle municipal and **industrial solid waste**. A **composite liner** is placed under the landfill. The intention is to prevent water pollution. However, environmental agencies suggest that this is only a temporary barrier. On top of the liners is a series of **cells** which have **daily cover** over them. **Lifts** lead to multiple layers of cells.

Solid waste landfills are extremely common. But they are not without problems. Many of them have reached or are close to **disposal capacity**. As the population grows, this will become a bigger problem. In addition, landfills release flammable **toxic** gases as waste **decomposes**. **Methane recovery** can be accomplished with a series of pipes that suck the gas out. Meanwhile, underground **carbon storage** can prevent CO₂ from entering the atmosphere.

Get ready!

1 Before you read the passage, talk about these questions.

- 1 Why is waste management important?
- 2 How do solid waste landfills handle waste?

Reading

2 Read the magazine article. Then, choose the correct answers.

- 1 What is the purpose of the article?
 - A to compare types of waste management facilities
 - B to describe waste management problems and solutions
 - C to explain how solid waste landfills are created
 - D to highlight the harmful effects of open dumps
- 2 What can be inferred about solid waste landfills?
 - A They can be difficult to operate.
 - B They often have hazardous liquids.
 - C They may eventually pollute water.
 - D They have too many cell layers.
- 3 Which of the following is NOT a problem with waste facilities?
 - A They are quickly filling up.
 - B They emit hazardous gases.
 - C They are not compacted well.
 - D They can catch fire.

Vocabulary

3 Match the words or phrases (1-8) with the definitions (A-H).

- | | |
|----------------------|---------------------------|
| 1 ___ toxic | 5 ___ composite liner |
| 2 ___ cell | 6 ___ methane recovery |
| 3 ___ lift | 7 ___ disposal capacity |
| 4 ___ carbon storage | 8 ___ surface impoundment |
-
- A the collection of a gas so that it can be used for another purpose
 - B an area of compacted waste
 - C a hole that holds liquid waste
 - D a synthetic material placed over compacted soil
 - E poisonous
 - F the largest amount of waste a facility can hold
 - G a layer put over cells when they are full
 - H the capture and storage of CO₂ so that it doesn't pollute the atmosphere



4 Choose the sentence that uses the underlined part correctly.

- 1 Injecting liquid into underground rock is one way to get rid of waste permanently.
_ _ _ p _ _ e _ _ _ s p _ _ a _
- 2 The manufacturing process creates a lot of garbage from industrial facilities.
_ _ d u _ _ _ a _ s _ _ _ d _ a _ _ _
- 3 Many poor countries have lots of large, unregulated areas where people throw trash.
_ _ e _ _ u _ _ s
- 4 Methane is an extremely dangerous greenhouse gas.
_ _ _ a r _ _ _ s
- 5 Some items in landfills may never break down.
_ _ c _ _ _ o _ _
- 6 The layer of soil put over cells prevents the wind from blowing waste around.
d _ _ _ _ o _ _ r
- 7 Most of the city's waste goes to a(n) place where waste is dumped and buried.
_ o _ _ _ _ s _ _ l _ _ _ _ l _

5 Listen and read the magazine article again. What are some ways to manage hazardous liquid waste?

Listening

6 Listen to a conversation between an environmental engineer and a city planner. Mark the following statements as true (T) or false (F).

- 1 ___ The city's solid waste landfill already has a methane recovery system.
- 2 ___ The landfill's daily covers keep garbage in place and control odors.
- 3 ___ The engineer will make plans for a carbon storage system.

7 Listen again and complete the conversation.

Engineer: Okay. I think that a system for 1 _____ would be very beneficial.

City Planner: I was under the 2 _____ that we had a system to do that.

Engineer: No, not 3 _____.

City Planner: I can't believe that. What safety features do we have in place?

Engineer: There's an impermeable 4 _____ to protect the groundwater supply.

City Planner: Okay, but that's pretty standard with solid waste landfills. What else do we have?

Engineer: There's a system of applying 5 _____.

City Planner: I'm not 6 _____ with that.

Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

I was under the impression that ...
Yes, that's right./No, not at this time.
Let's get going on ...

Student A: You are an environmental engineer. Talk to Student B about:

- what waste disposal methods your city currently uses
- what safety features the facilities have

Student B: You are a city planner. Talk to Student A about your city's waste management methods.

Writing

9 Use the magazine article and the conversation from Task 8 to complete an informational flyer about your city's waste management programs. Include: the methods the city uses, their benefits, and their safety features.