

US EPA ARCHIVE DOCUMENT



# Liquid Systems and Monitoring

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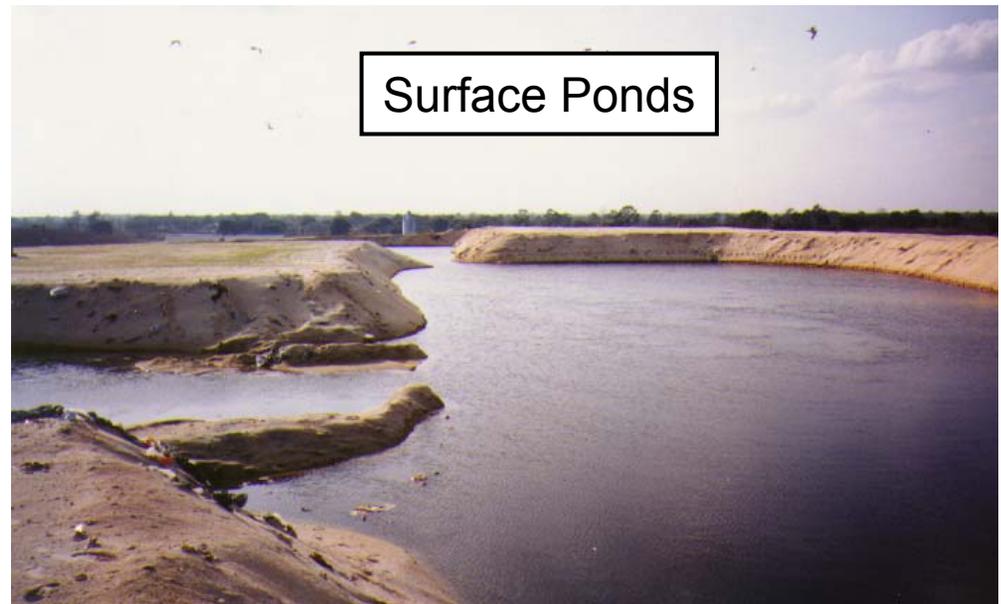
Bioreactor Landfill Workshop  
Arlington, VA  
February 27-28, 2003

# Topics

- Leachate recirculation systems
  - Surface Systems vs Subsurface Systems
  - Retrofit vs As-built
- Moisture distribution issues
- Monitoring

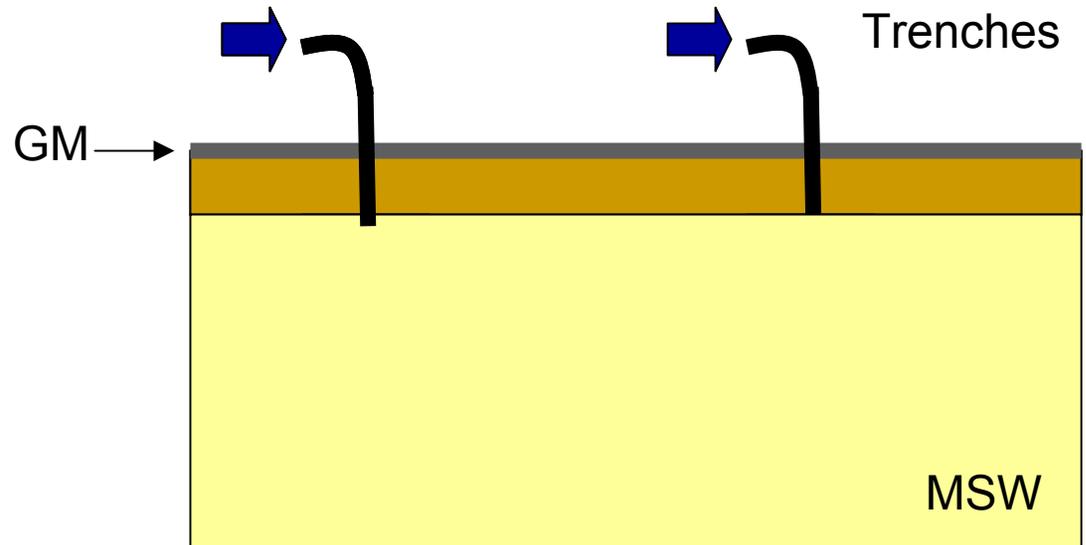
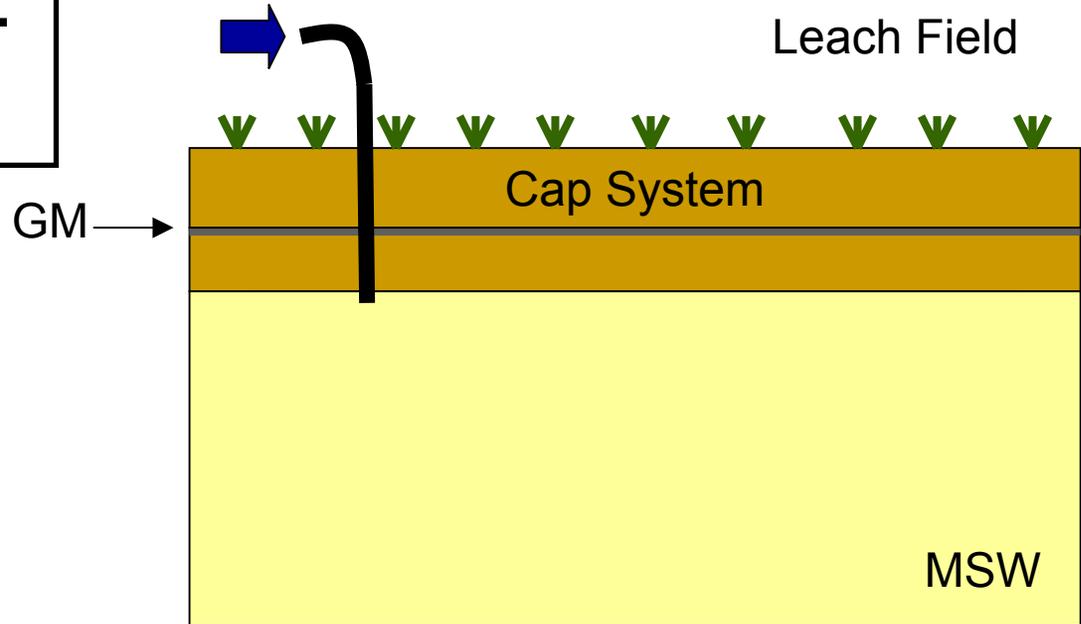
# Surface Methods: Pre-Cap

- Spray Irrigation
- Drip Irrigation
- Tanker Truck Application
- Infiltration Ponds



# Surface Methods: Post-Cap

- Leach Field
- Trenches
- Drip Irrigation



# Subsurface Methods

- Vertical Injection Wells
- Horizontal Trenches
- Buried Infiltration Galleries



# As-Built vs Retrofit

## As-Built

- Surface application methods as waste is filled up. Focus on working face.
- ***Horizontal trenches*** buried in the landfill as waste is deposited.
- Surface systems when complete.

## Retrofit

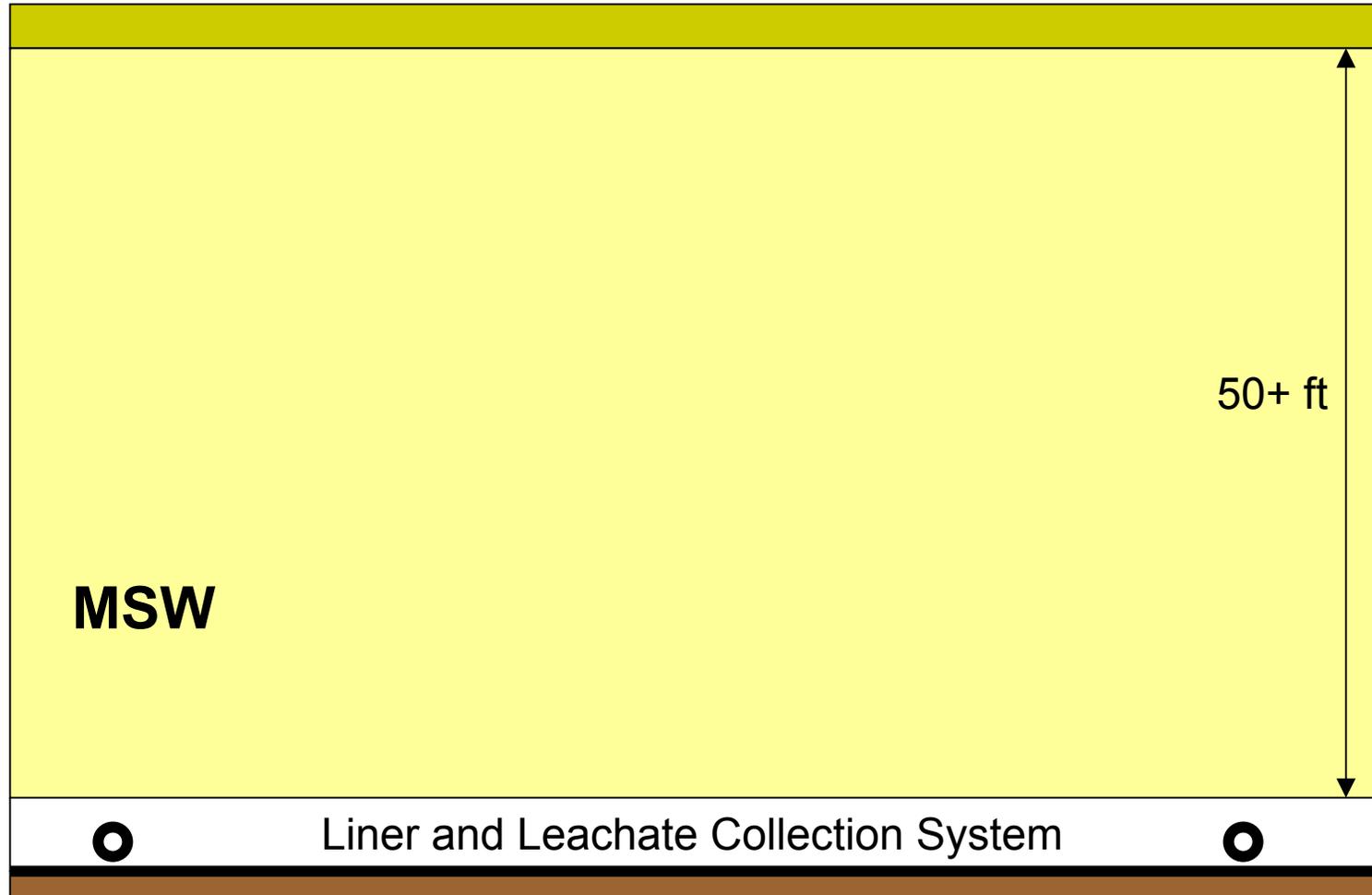
- Surface systems on completed waste fill.
- ***Vertical wells.***
- Shallow subsurface horizontal trenches.

# Focus on Two Subsurface Methods

- Horizontal Trenches
  - Shallow systems
  - Deep systems
- Vertical Injection Wells
  - Large diameter systems
  - Small diameter systems

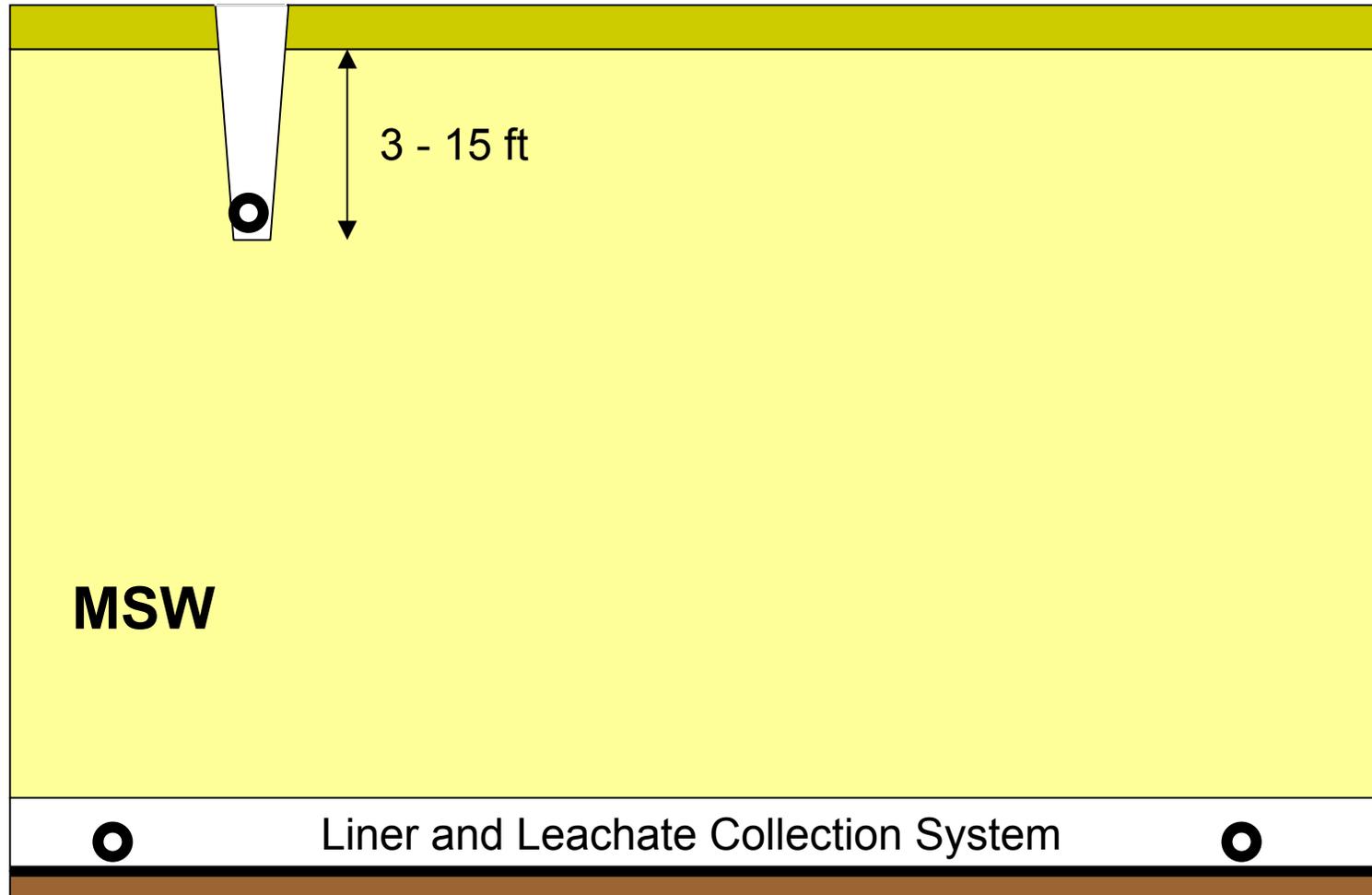
# Shallow Horizontal Trenches

## 1. Existing Landfill at Grade



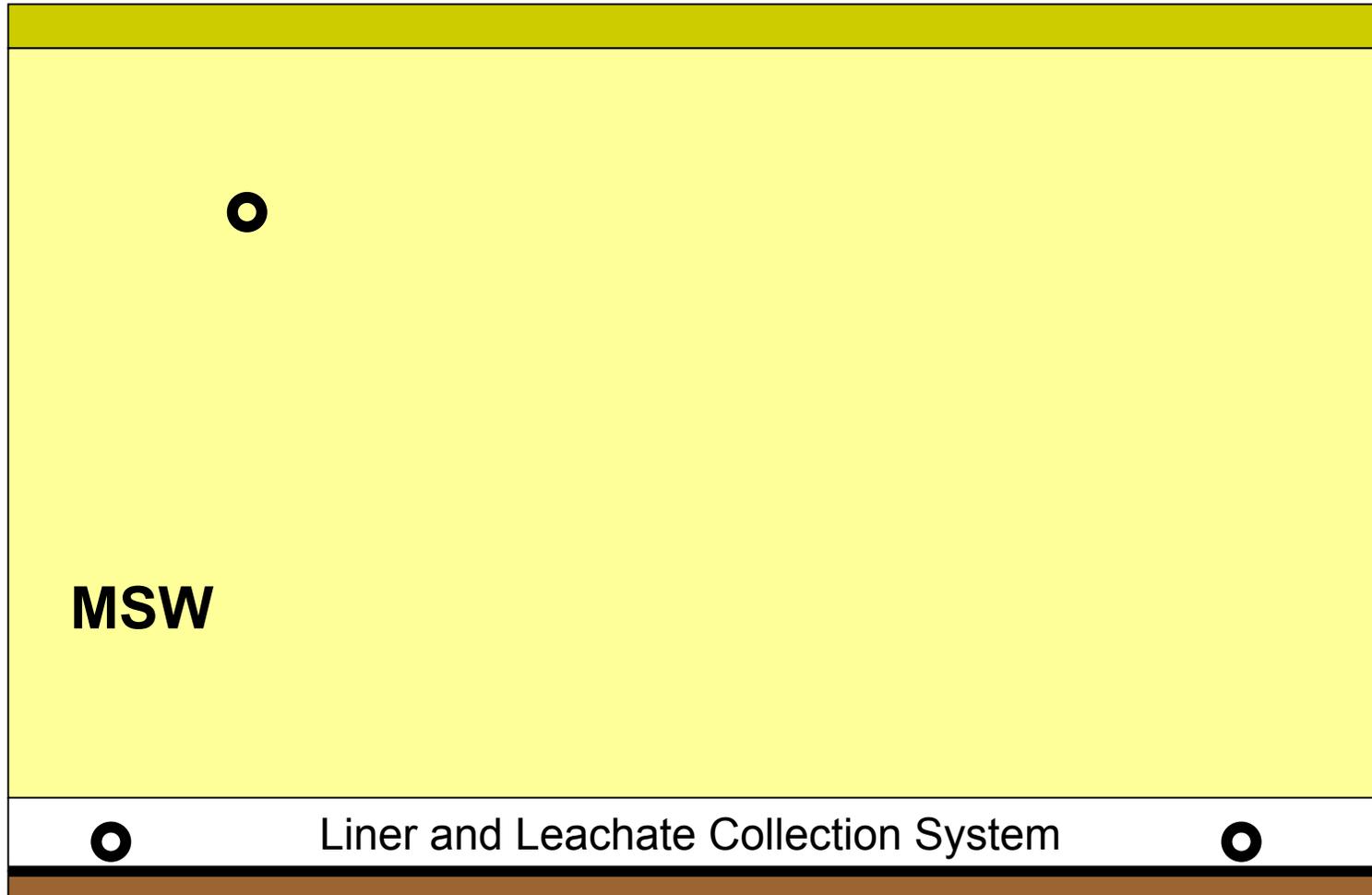
# Shallow Horizontal Trenches

## 2. Excavate Trench and Install Bedding and Pipe



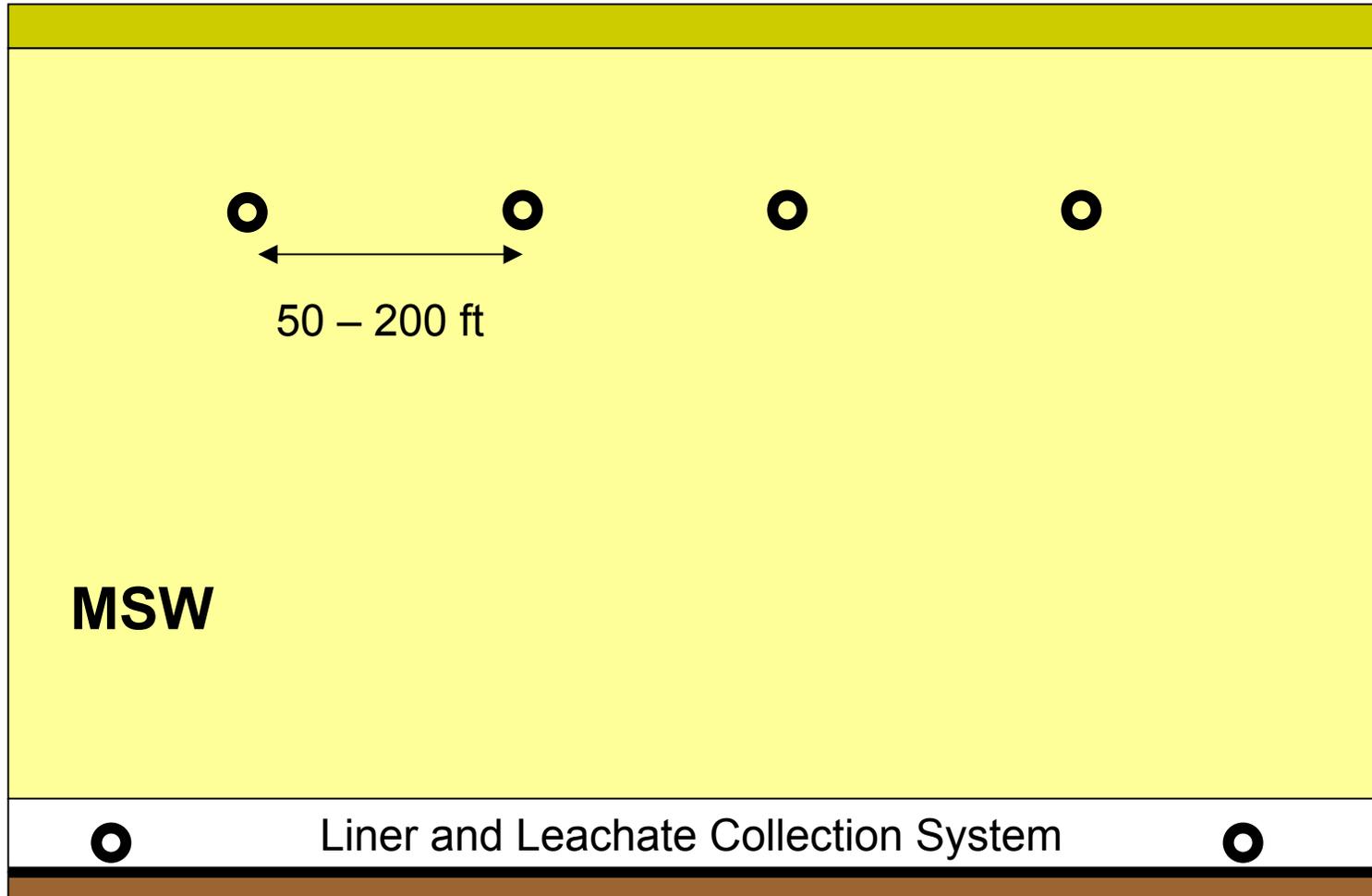
# Shallow Horizontal Trenches

## 3. Backfill



# Shallow Horizontal Trenches

## 4. Additional Trenches



# Shallow Horizontal Trenches

## 5. Recirculate

