

# Veterinary Services

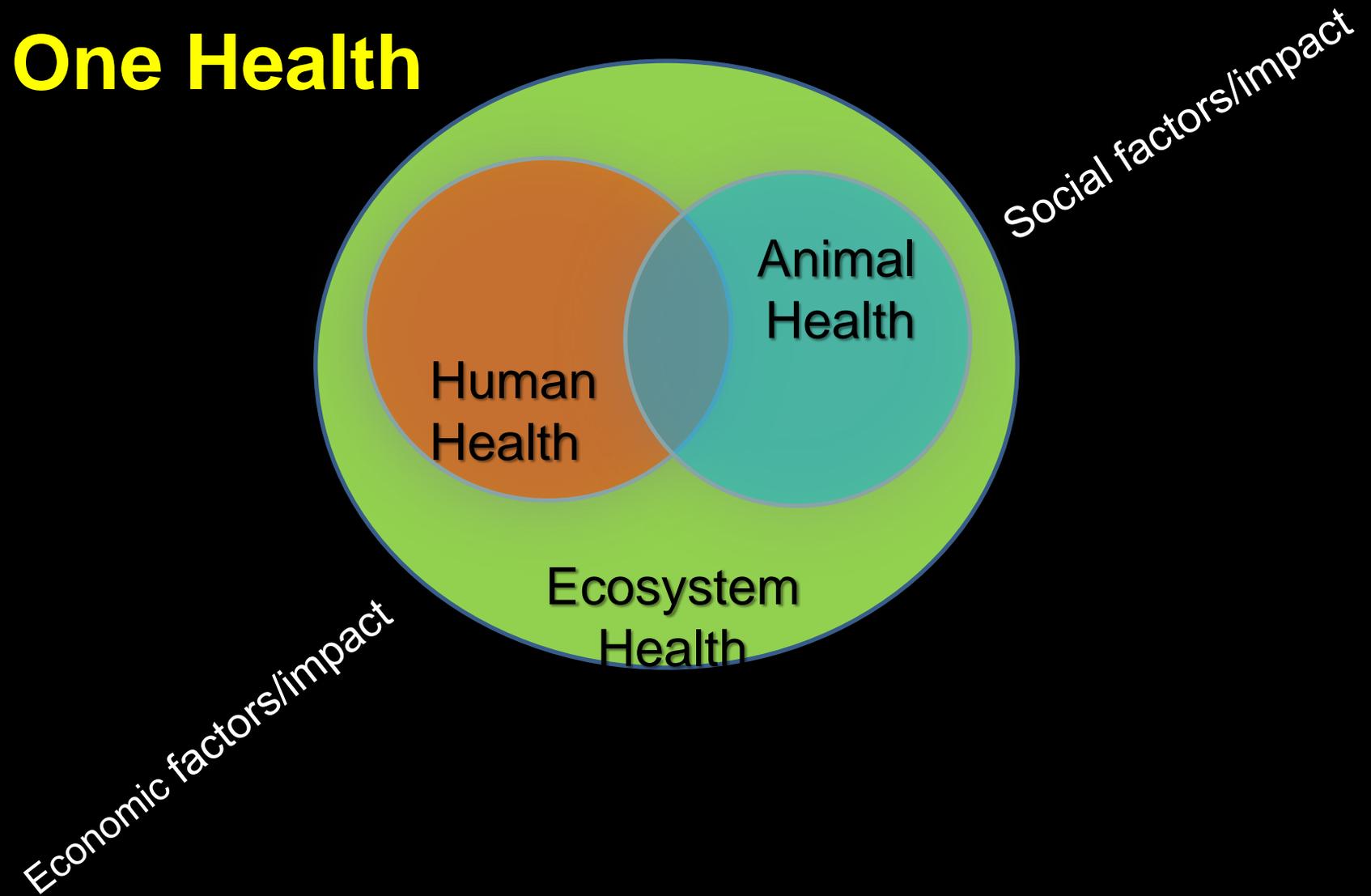
Strategies for Reducing Risk and  
Expediting Recovery from Avian  
Influenza and Other Outbreaks

**Lori P. Miller, PE**

Senior Staff Officer/Environmental Engineer  
U.S. Department of Agriculture  
Animal and Plant Health Inspection Service  
Veterinary Services  
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# One Health





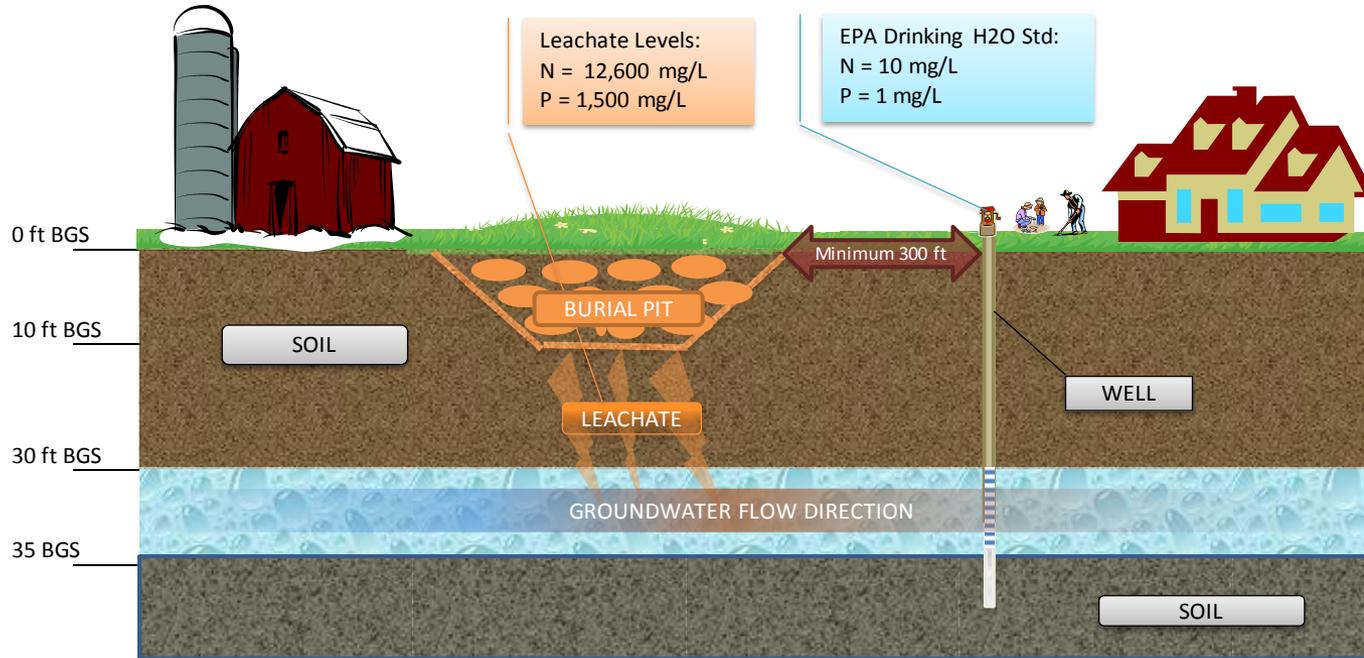


Whether agents are introduced intentionally or accidentally, animal disease outbreak response includes destroying affected animals, disposing of infected material, and decontaminating affected people, premises, and things.

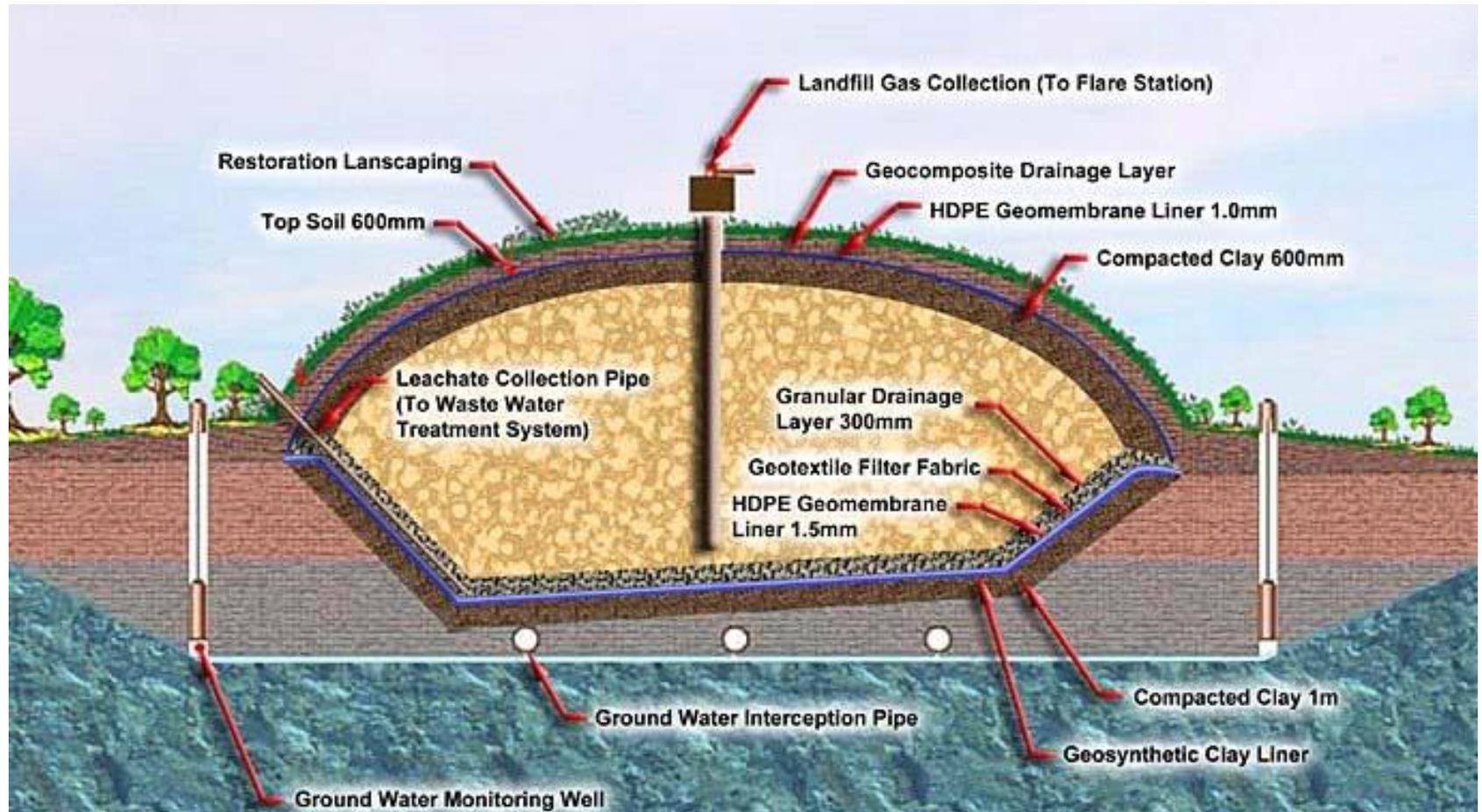
Most countries have policies supporting destruction and burial of infected animals, but it may be time to consider additional strategies.



# Burial Consequences



# Safer Burial Pit = Engineered Landfill





United Kingdom, Japan, South Korea, USA

# **Lessons learned from other countries**

# 2001 UK FMD Outbreak



BURIAL AND BURNING CAUSED MAJOR IMPACTS



From "A Rapid Qualitative Assessment of Possible Risks to Public Health from Current FMD Disposal Options", UK Dept. of Health, June 2001.

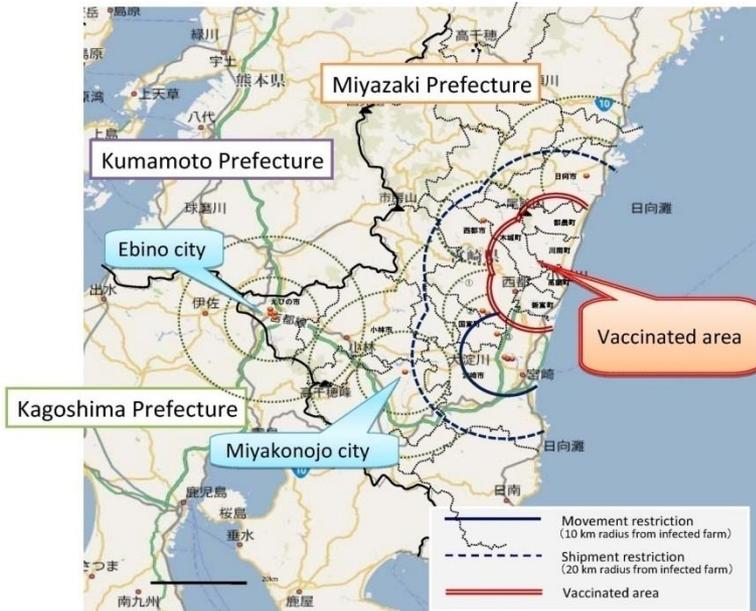
<b>Potential Significant Public Health Hazard</b>	<b>DISPOSAL OPTION</b>				
	<b>Rendering</b>	<b>Controlled Incineration</b>	<b>Engineered Landfill</b>	<b>Pyre</b>	<b>Burial</b>
<b>Cryptosporidium</b>	Green	Green	Yellow	Green	Red
<b>BSE*</b>	Green	Green	Yellow	Yellow	Red
<b>Sulfur Dioxide</b>	Green	Yellow	Green	Red	Green
<b>Particulates</b>	Green	Yellow	Green	Red	Green
<b>E. coli, Campylobacter</b>	Green	Green	Yellow	Green	Red
<b>RANK</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

\* Assumes rendered product is incinerated.

# 2010 Japan FMD Outbreak – Lack of Burial Sites Slowed Response



# 2010 Japan FMD Outbreak — Used Vaccinate-to-Kill to Gain Time to Find Burial Sites



Time series of the number of infected/suspected animal to be slaughtered



# South Korea 2011 Experience – Major Environmental Impacts



Quarantine workers yesterday pour disinfectant into waste pumped up from a culled animal burial site in Namyangju, Gyeonggi. In the first test, animal blood was discovered. [YONHAP] Feb 22

.... “Measures to prevent water pollution are urgently needed, such as installing blocking walls inside the disposal sites or using pumps to remove the waste,” Cho said. Cho also urged local governments to build incinerators to burn animal remains instead of burying them. ...



**“For owners, health workers, culling livestock brings grief and even PTSD”**



February 21, 2011

**“Vaccines could have stopped FMD**

But government was preoccupied with maintaining vaccine-free status”



# **USA 2015 Avian Influenza Case Study**

USDA 2014-2015 avian influenza response was the largest in US history, costing over \$950M in federal funds, with industry losses in the billions.







**COMPOSTING WAS NECESSARY BECAUSE THE GROUND WAS OFTEN TOO WET TO BURY, BUT IT HAD TO BE DONE QUICKLY**

**Current US response goal is depopulation within 24 hours**



# Composting needs:

- EQUIPMENT
- OPERATORS
- EXPERTS
- CARBON MATERIAL
- MOISTURE
- DECONTAMINATION STATION



## **On-site burial needs:**

LOADING EQUIPMENT

HAULING EQUIPMENT/DRIVERS

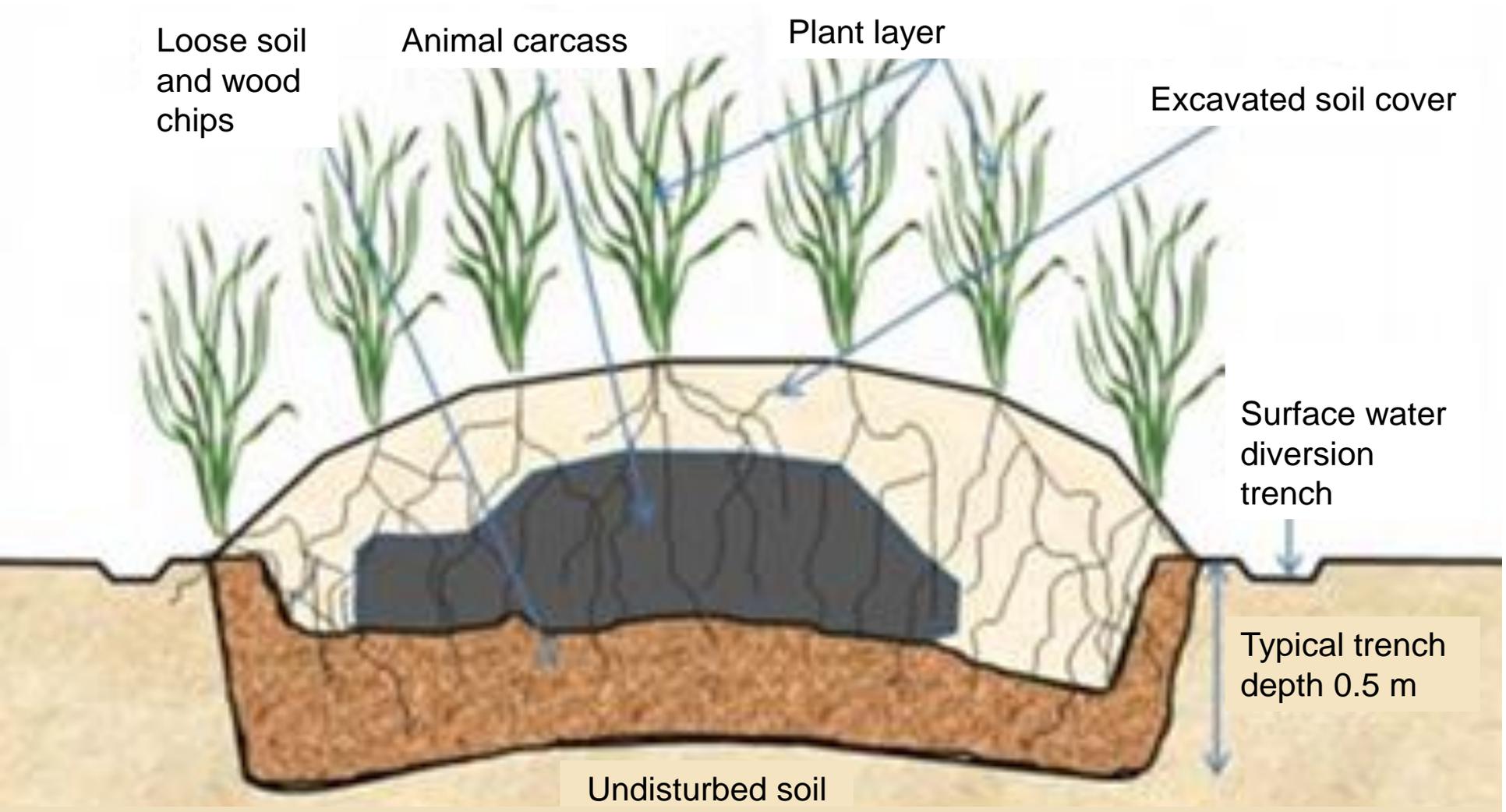
EXCAVATION EQUIPMENT

DECONTAMINATION STATIONS

APPROVALS



# ABOVE GROUND BURIAL





# SUSTAINABLE CARCASS MANAGEMENT

CARCASS MANAGEMENT OPTION	Prevent the degradation of soil and water quality	Use natural biological cycles and controls	Use nonrenewable resources efficiently	Assure the well-being of farmers and their families
UNLINED BURIAL	NO	PARTIAL	NO	NO
OPEN BURNING	PARTIAL	NO	NO	NO
LANDFILL	YES	PARTIAL	NO	YES
WASTE 2 ENERGY	YES	NO	YES	YES
RENDERING	YES	NO	YES	YES
ABOVE GROUND BURIAL	YES	YES	YES	LIKELY
COMPOSTING	YES	YES	YES	YES



# Summary: Strategies to Reduce Risk

- Consider alternatives to burial, such as sustainable carcass management and vaccination
- Euthanize infected animals quickly to reduce virus production
- Ensure carcass management is implemented as soon as possible after euthanasia to minimize vector spread
- If carcasses must be stored, be sure they are covered and that liquids are contained



United States Department of Agriculture

Lori P. Miller, PE  
Senior Staff Officer/Environmental Engineer  
U.S. Department of Agriculture  
Animal and Plant Health Inspection Service  
Veterinary Services

[lori.p.miller@aphis.usda.gov](mailto:lori.p.miller@aphis.usda.gov)

301-851-3512

