

# Sustainable management of contaminated sites

Presentation 4.3

Phase 4 - Zoning of contaminated site

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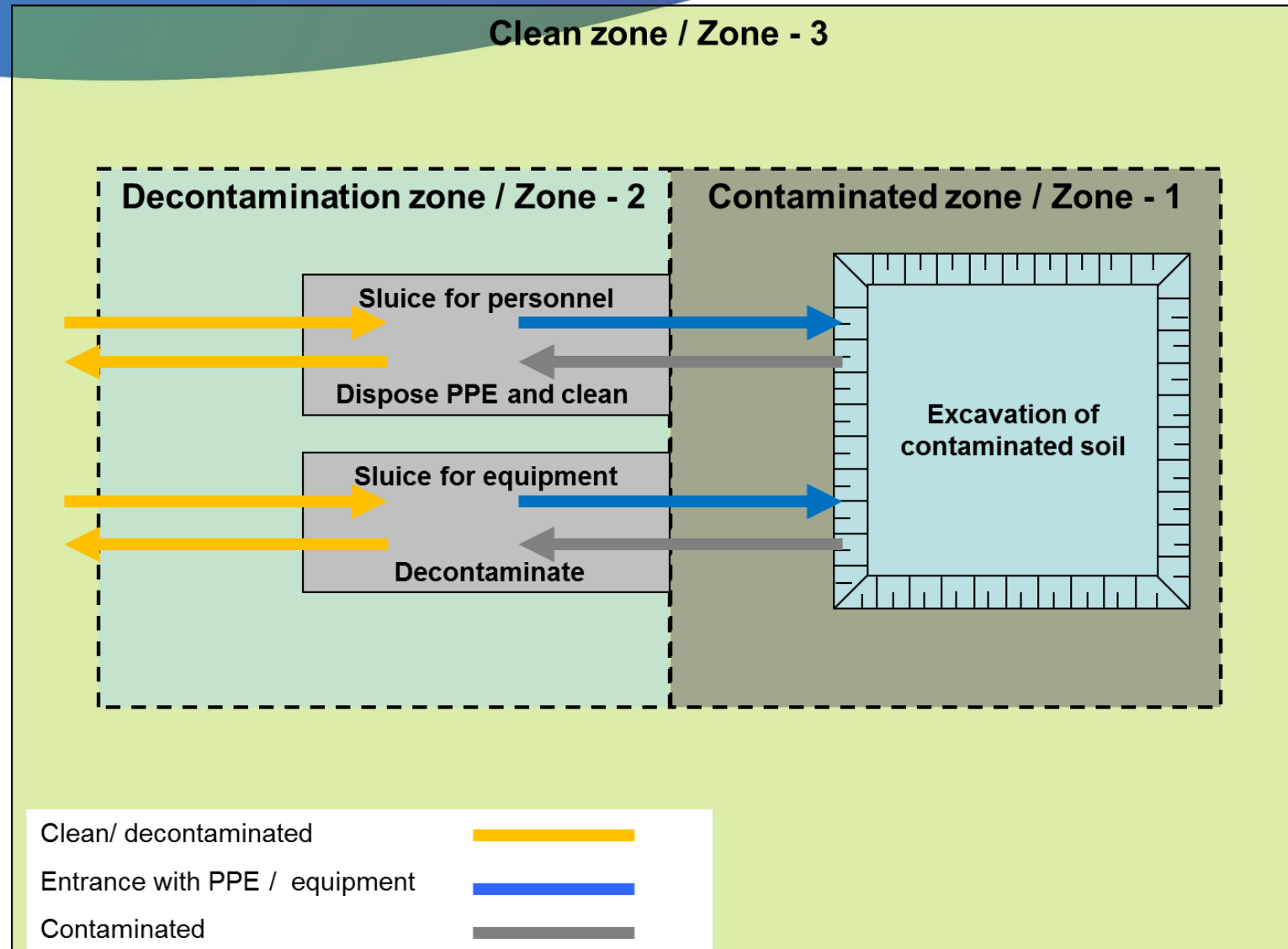
# Objectives of the contaminated site zoning

- Creating a safe working area
- Prevent cross contamination
- Protect the general public
- Protect the workforce
- Protect the environment



**We take care of each other, so that  
everyone arrives home safely &  
healthy**

# Zoning of remediation site



# Zoning soil remediation site

- **Contaminated Zone** : In case of remediation of contaminated soil this zone is where the contaminated soil is excavated, stored, treated or loaded and or contaminated groundwater is pumped and treated
- **Decontamination Zone or transition zone.** This is the area where the workers of contaminated zone are removing their PPE and leave behind or decontaminate all contaminated equipment when moving to the clean zone. This is also the area where trucks and contaminated equipment are decontaminated before moving to the clean zone
- **Clean Zone:** This is the remaining area. In this area there is no waste handling, storage and contaminated material present



# Principles for construction of zones

- Containment / barriers
- Normally existing structures are used to define boundaries of 3 zones
- Enforce
  - Strict rules for access and departure zones
  - Clear signs indicating the 3 zones
  - Provide clear instructions
  - Emergency equipment in decontamination zone ready available
    - ✓ First aidkit
    - ✓ Eye-shower
    - ✓ Emergency shower
    - ✓ Washing facility



# Warning signs to be used at the working site entrance

**Warning!**  
Site remediation.  
No unauthorized addittance  
Report to contractor (*phone number*)

The image displays a collection of safety signs for a remediation site. At the top, the text reads: "Warning! Site remediation. No unauthorized addittance Report to contractor (*phone number*)". Below this text are two rows of signs. The first row consists of six blue circular signs with white icons: a hard hat, a boot, a pair of gloves, a person wearing a mask and goggles, a person wearing safety glasses, and a person in a full protective suit. The second row consists of two red circular signs with a diagonal slash: one with a cigarette and one with a glass, fork, and knife.

# The contaminated zone

## Typical features of contaminated zone include

- Uncontrolled chemicals
- High level of protection required
- High hazard/risk



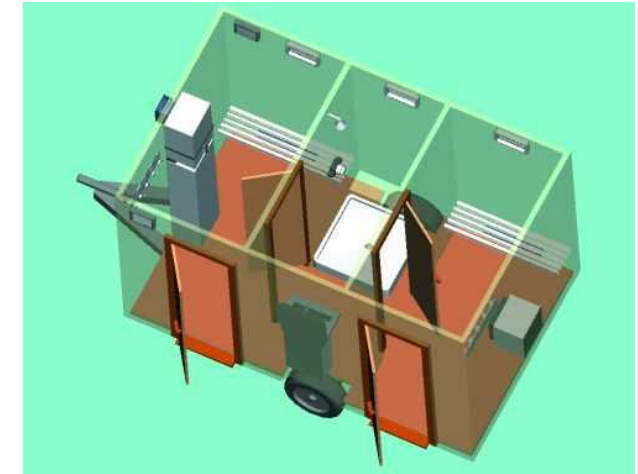
## Activities to be carried out in contaminated zone include

- Stabilization
- Repackaging
- Decontamination

# The intermediate / decontamination zone

## Typical features of intermediate / decontamination zone include

- Interim storage of
  - Repacked POP pesticides
  - Disposables and non-disposables PPE
- Lower hazard/risk
- Sluice



## Activities to be carried out in intermediate / decontamination zone include

- Put on PPE when entering the contaminated zone
- Remove PPE when leaving to the clean zone
- Dispose used disposable PPE when leaving for the clean zone
- Store contaminated non-disposable PPE for next visit to the contaminated zone
- Loading of packages hazardous waste on to vehicles
- Decontamination of materials and equipment used in the contaminated zone





# The clean zone

## Typical features of clean zone include:

- No restrictions on access
- No hazard/risk

## Activities for in the clean zone include:

- Storage clean PPE
- Storage empty repackaging materials
- Administration
- Monitoring and supervision the works



# Entering and leaving the contaminated zone

- **The contaminated zone is always entered and exited through the decontamination zone**
- Use stage process for entry contaminated zone from decontamination zone
  1. Have all clean PPE available
  2. Put PPE on and leave your clean clothing behind
  3. Check with the supervisor if PPE are correct
- Use stage process for exit contaminated zone to decontamination zone
  1. Decontaminate non disposables
  2. Remove all PPE and dispose disposable PPE as waste
  3. Leave non disposables behind clothing behind
  4. Decontaminate – wash hands and face - dress

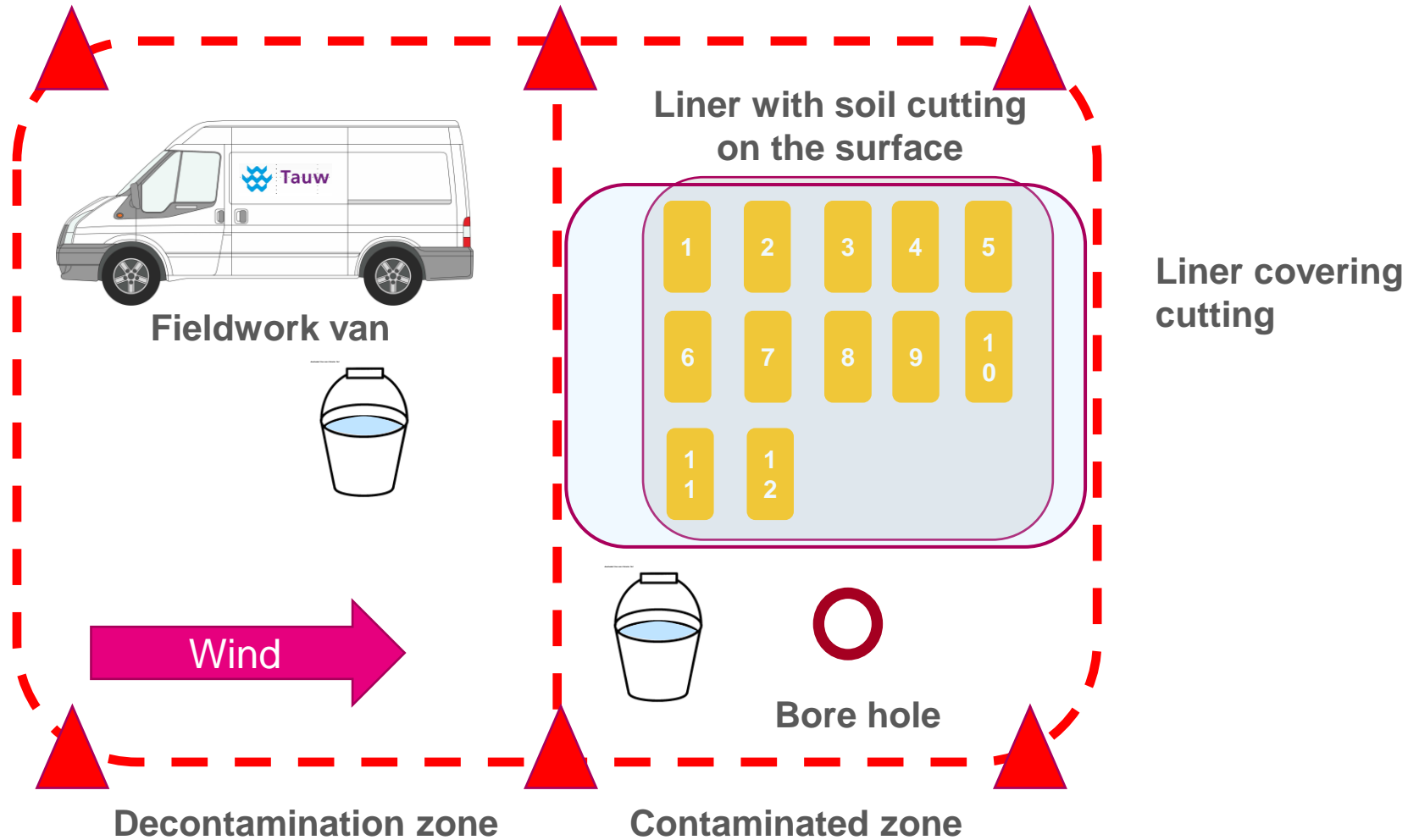


# The installation of the decontamination zone

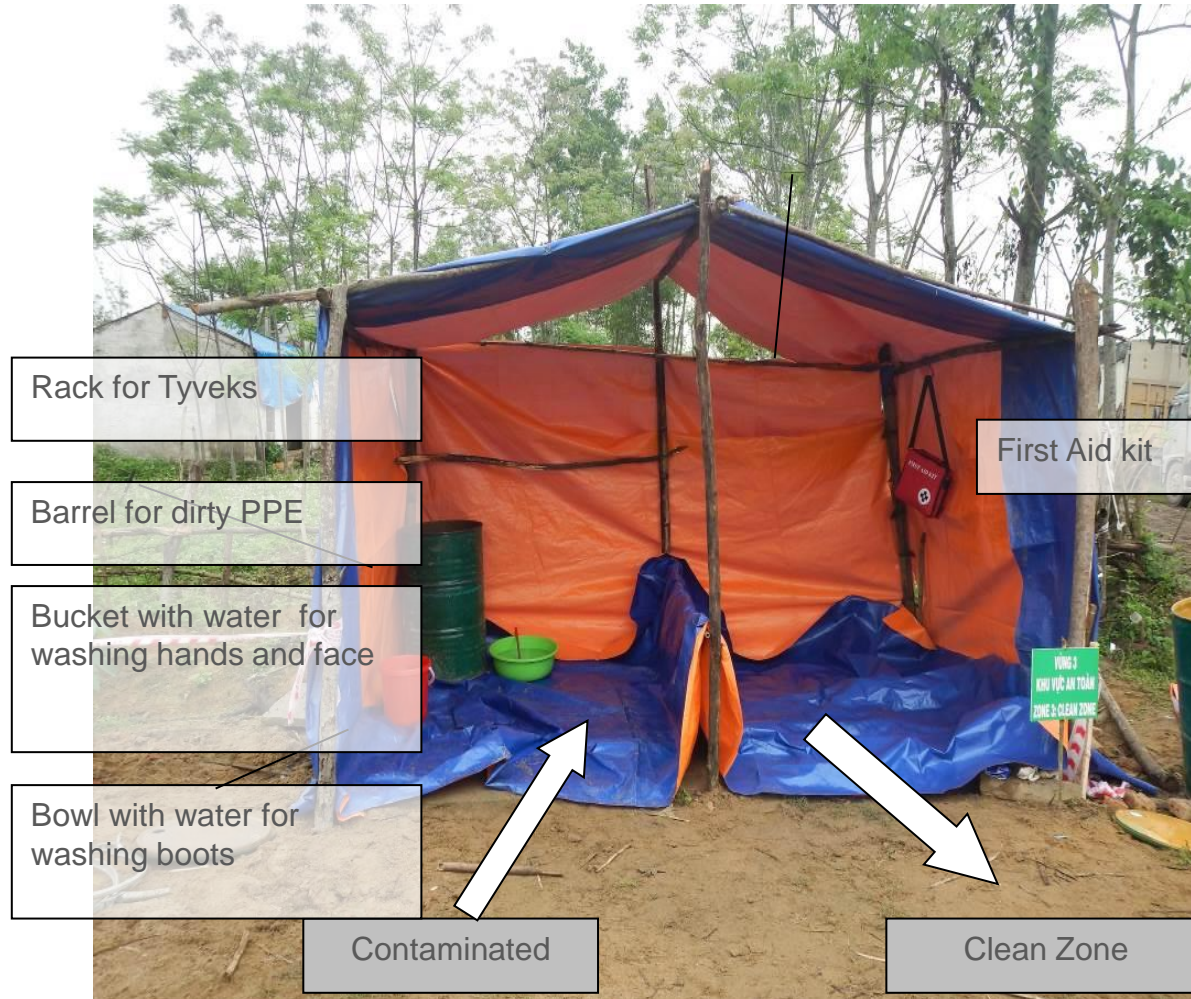
- Boot cleaning station (a bowl or similar container to stand in and wash the boots)
- Water and soap to wash gloves
- A partner / helper to assist in decontamination of other PPE
- A barrier to prevent spread of contamination (polythene / steel tray)
- A container / drum for the disposal of contaminated disposable PPE
- A place to store decontaminated non-disposable PPE
- A place to store clean PPE ready for re-use
- Bag for boots and gloves ready for re-use
- Emergency Shower, first aid kit and eye wash station



# HSE Zoning at soil sample location



# Example of decontamination zone



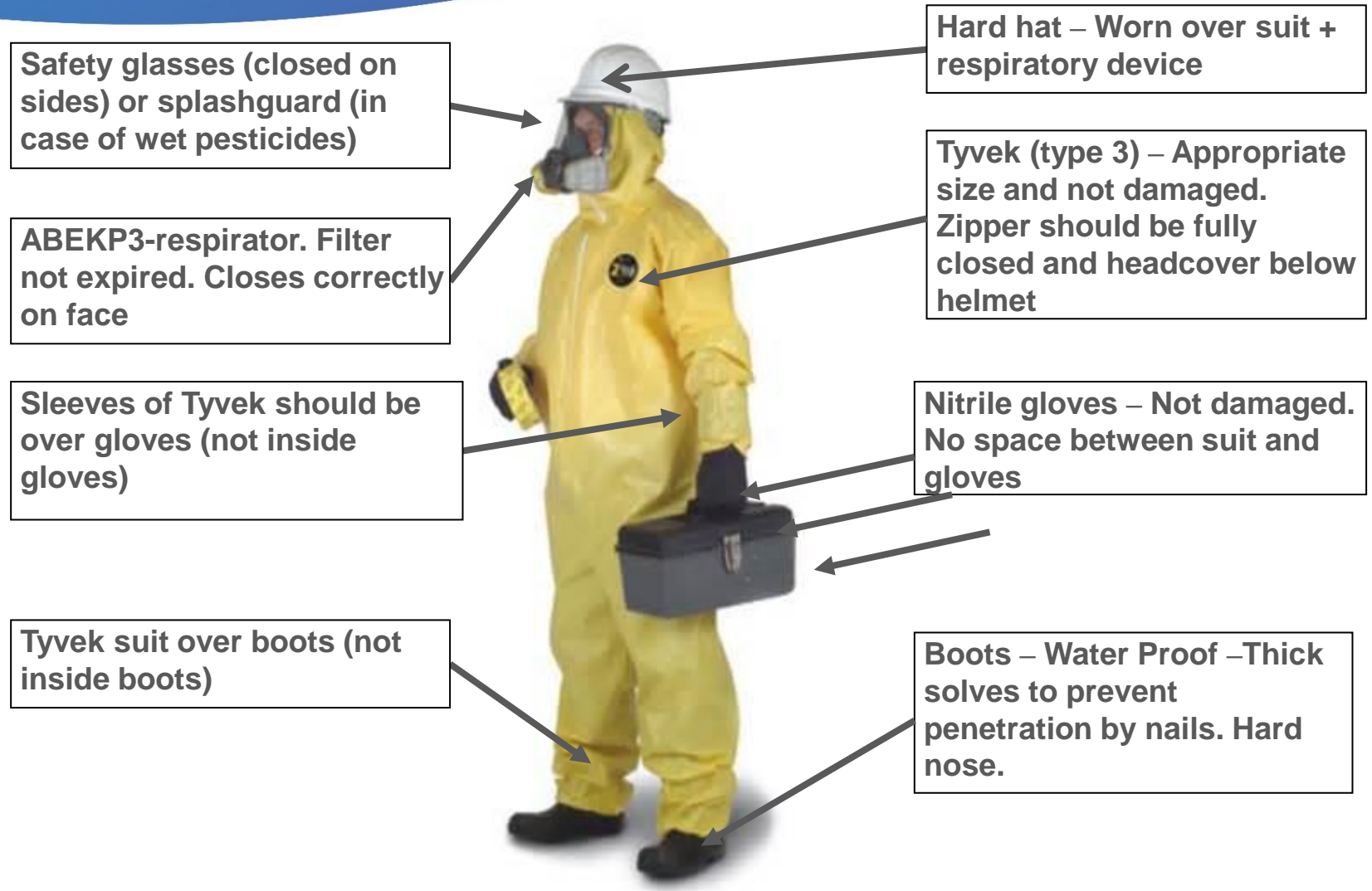
# Example of decontamination zone



# Contaminated zone



# Proper PPE to be used by a worker in the Contaminated zone working with liquids





# Overview of PPE usage per zone

PPE	Contaminated Zone	Decontamination Zone	Clean Zone
Body	Tyvek Type 3 (Yellow – wet conditions ) Tyvek Type 5 (White – dry conditions)	Type 5 (Tyvek - White)	Cotton coveralls – visual amplification
Hands	Nitrile gloves	Nitrile for handlers Leather as options for others	Nitrile or Leather gloves
Lungs	P3-full face	Dust mask	Dust mask
Feet	Safety boots with or without cover shoes– dry conditions	Safety shoes with cover shoes– dry conditions	Safety shoes
Head	Safety helmet	Safety helmet	Safety helmet
Ears	Only protection needed in case of noisy machinery	Only protection needed in case of noisy machinery	Only protection needed in case of noisy machinery
Eyes	Closed glasses (dry) Splash guard (wet)	Safety glasses	Safety glasses



# What would be here the zoning?

Contaminated zone

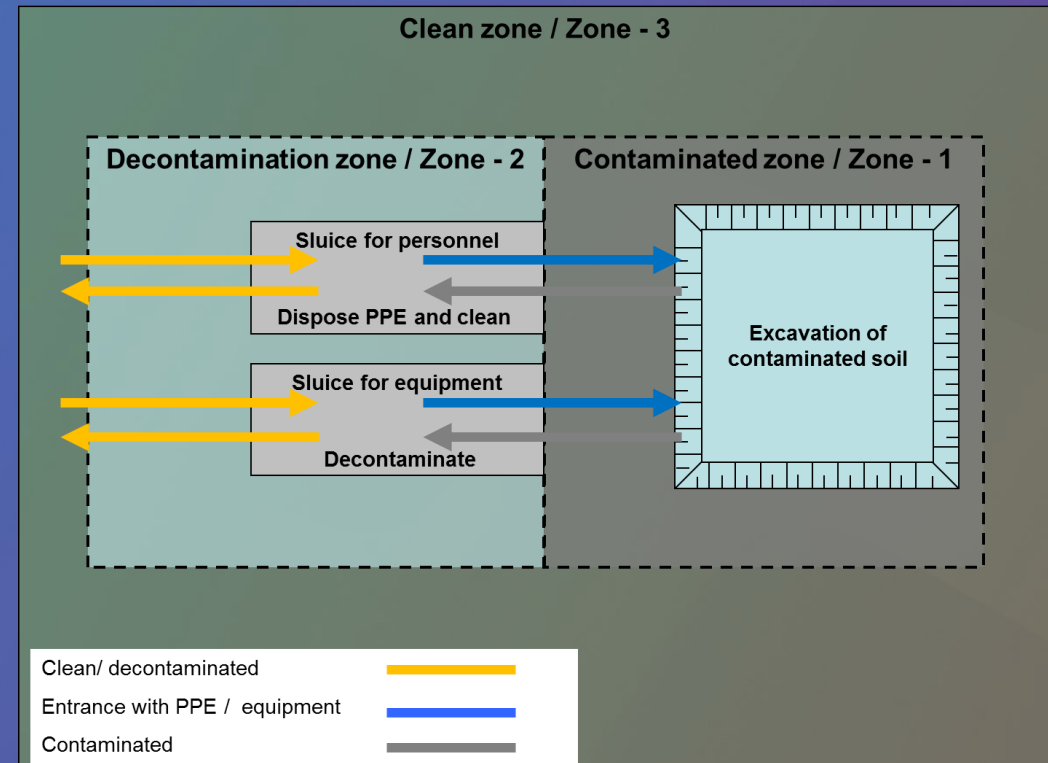
Suice

Clean zone



# Questions?

# Contact



Thank you for your attention

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