



**USAID**  
FROM THE AMERICAN PEOPLE

# PROPOSED MEASURES TO REDUCE HEAVY METAL CONTAMINATION AT CRAFT VILLAGES

*Bac Ninh, January 2021*

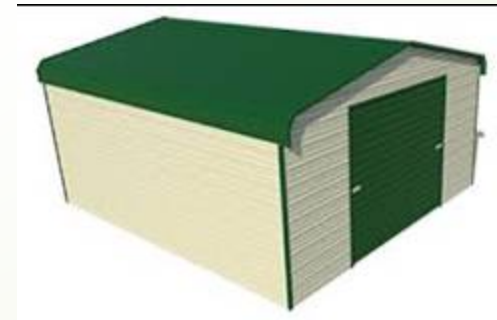
*Disclaimer: The training program is organized and co-chair by Bac Ninh DONRE and CECOD, with financial support from USAID through Pure Earth.*

# SOME SOLUTIONS TO REDUCE CONTACT WITH HEAVY METALS

## 1. Reduce or stop metal recycling in residential areas



**Metal recycling operations in the neighborhood need to be shut down and moved into industrial clusters**



**Destroying old batteries and old electrical and electronic equipment should be done in closed areas separate from residential areas.**

## 2. Minimize heavy metal contamination from recycling facilities and limit heavy metal exposure

Metal furnaces generate smog and toxic fumes such as metal dust and metal compounds, fuel dust, SO<sub>2</sub> gas, CO, chlorine, etc.



*The metal furnace has a smoke and toxic gas extraction system*



*The polluted exhaust gas is treated with dust through cloth bag dust filter*



*The toxic gas is processed through a wet filter (Scrubber).*

However, these solutions have high costs and can only be applied to large businesses in industrial zones and industrial complexes.

# Industrial hygiene



*Concrete floor of the factory*



*Clean the factory with an industrial vacuum cleaner*



*Clean machines every day*

## *Limiting dust spread from transport vehicles*





# ***Change in waste management practices***



All generated waste is kept within the premises until ready for disposal, preferably in sacks and secured.

## **Provide personal protective equipment for workers**



### 3. Clean up contaminated soil and households in residential areas

**Eliminate polluted waste and contaminated soil**



**Do not store metal-contaminated waste or dust from cloth filter in the garden**



**Do not use battery covers as fences, flower pots, or pavements**

**Completely clean inside the house**



**Clean the walls with a sponge or wet cloth**



**Clean the floor and yard with a vacuum cleaner or mops**



**Wipe flat surfaces**

# ***Cover contaminated soil to avoid exposure***

**Object:** Gardens with lead content in soil > 1200ppm

**Large area (> 20 m<sup>2</sup>) and need to continue using for gardening: Cover the surface with clean soil or clean sand**

## **Surface preparation:**

- Clear, harvest vegetables, grass ... growing in the garden;
- Pick up bricks, broken stones, packaging bottles out of the area planned to cover;
- Leveling the ground to get altitude.



## **Carry out covering:**

- Cover a layer of clean sand 5 ÷ 10 cm thick on the surface of metal contaminated soil;
- Cover the entire surface with geotextile (for gardens with perennial plants, zoning off the stump is needed before proceeding);
- Cover the geotextile-covered area with a layer of clean soil or sand with a thickness of 15 ÷ 20 cm; - Tightly
- Check the metal concentration in the soil



## ***Cover contaminated soil to avoid exposure (next)***

- 2. Small area (<20 m<sup>2</sup>) and area not needed for gardening: Pour concrete on the surface (roadway) or pave bricks (yard, adjacent to the yard)**

### **Surface preparation:**

- Clear, harvest vegetables, grass ... growing in the garden;
- Pick up bricks, broken stones, packaging bottles out of the area planned to cover;
- Leveling the ground to get elevation, creating a slope from 1 ÷ 3%

### **Carry out covering:**

- Cover the entire surface with geotextile (for gardens with perennial plants, zoning off the stump is needed before proceeding);
- Cover a layer of clean and 5 ÷ 10 cm thick sand on the surface of the area covered with geotextile;
- Proceed pouring concrete 8÷10 cm thick or pave bricks;
- Tightly
- Re-check the metal concentration in the soil.





## 4. Give up the habit of bringing contaminated clothing into the house



**Do not bring labor insurance clothes home**



**Build bathrooms for workers**



**Wardrobe for workers**



**Temporary shower at workers' homes**



**Separately wash clothes for labor insurance outside the home**

## 5. Practice good hygiene and home cleaning to minimize exposure to heavy metals



***Remove dirty shoes before entering the house***



***Dọn vệ sinh nhà cửa hàng ngày***



***Wash the motorcycle's saddle after returning home***



***Don't prepare food on the floor***



***Must prepare food on a clean table top***

## 5 . Practice good hygiene



***Clean up soil from fruits and vegetables in the garden before bringing them indoors***

***Wash your hands often, especially before eating, drinking or smoking***

***Keep children away from all work clothes, including clean and dirty***



***Do not eat or feed children in areas contaminated with heavy metals***

***Must eat on a clean table top***



## 6. Dietary recommendations



**Eat foods rich in iron and calcium can reduce the amount of heavy metals absorbed.**

Calcium-rich foods include milk, cheese, yogurt, tofu, and green leafy vegetables.

Iron-rich foods include beans, lean meats, peanuts, and whole grains.

Foods rich in vitamin C include oranges, grapefruit, mangoes, tomatoes, and green bell peppers.

**Drinking water cannot reduce the amount of heavy metals absorbed**

**The diet, especially children's, should include:** milk and dairy products, tofu, green leafy vegetables, oranges and other citrus fruits.

**Eat less, divide into smaller meals throughout the day,** reduce the amount of heavy metal absorbed. Children should eat 4 to 6 meals a day. When children are full they absorb less heavy metals.

# Prevention of heavy metal poisoning

- Raise awareness of the community about the ways heavy metals enter the body, the harmful effects of heavy metal poisoning, especially for children.

Comply with regulations and avoid high risk factors for heavy metal poisoning, especially those with extensive exposure to heavy metals.

Screen test all patients with high risk. When sick, go to reliable medical facilities for examination and treatment.

- Avoid drugs of an unknown origin.

If there are signs and symptoms, go to the poison control center to be diagnosed and treated promptly

# Thank you for listening!

