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# *United States Air Force School of Aerospace Medicine*

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## **Control of Heavy Metal Dusts** **17 May 2011**

**U.S. AIR FORCE**

**Capt Matthew Ferreri, CIH  
USAFSAM/OEHR**

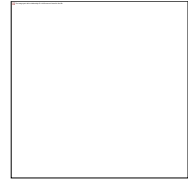
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# Overview

- Introduction
- Control
- Housekeeping
- Verification
- Sampling

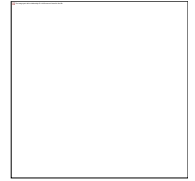


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# Introduction

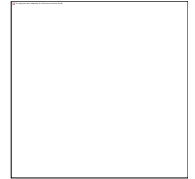
- **OSHA issued citation at Robins AFB in 2010**
  - Heavy metal dusts were major issue
- **No standard or “safe” level for surface loading**
- **OSHA calls for “free as practicable”**
  - Will not provide guidance on how clean is clean
- **Contamination needs to be evaluated**
  - Beyond simple airborne hazard evaluation
- **Drafted contamination control & housekeeping guidance**

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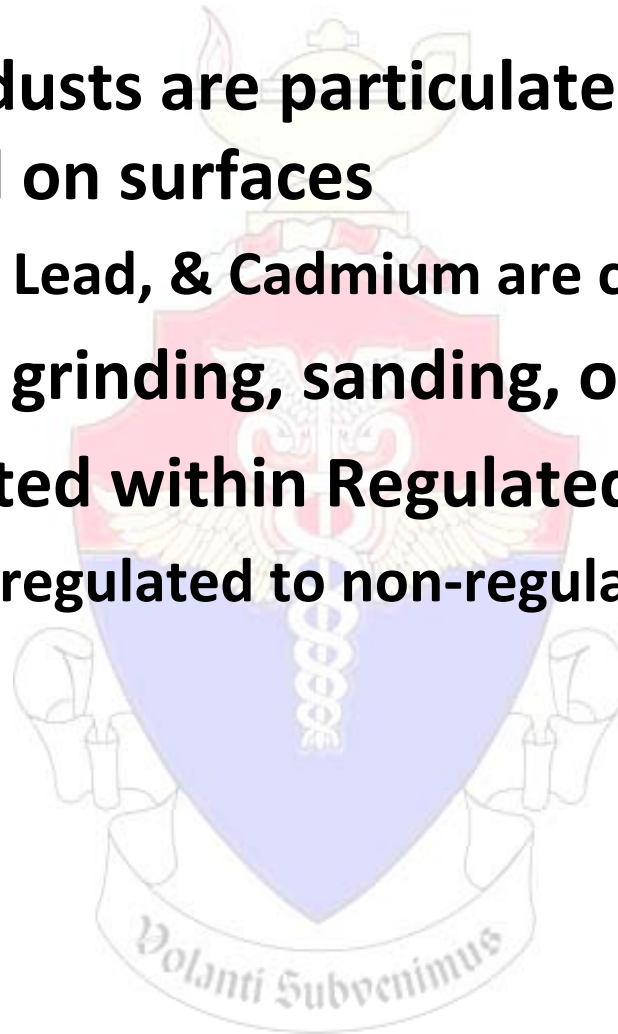
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# Introduction

- **Heavy metal dusts are particulate matter that has deposited on surfaces**
  - Hex Chrome, Lead, & Cadmium are common
- **Generated by grinding, sanding, or other work**
- **Often associated within Regulated areas**
  - Spread from regulated to non-regulated areas

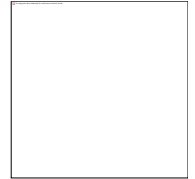


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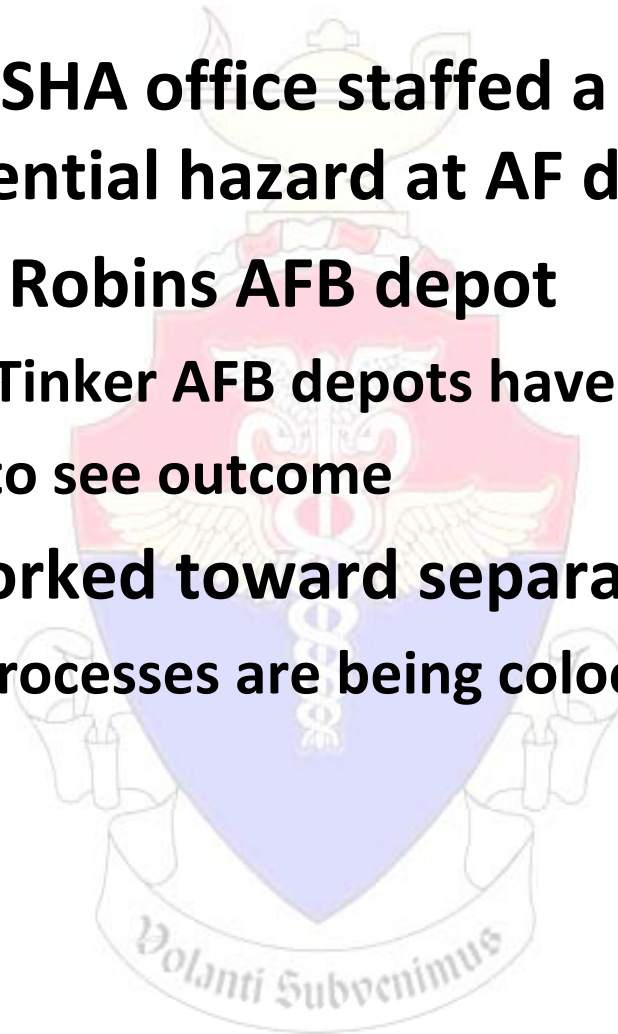
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# Introduction

- **The Atlanta OSHA office staffed a letter indicated potential hazard at AF depots**
- **In addition to Robins AFB depot**
  - Hill AFB and Tinker AFB depots have been inspected
  - Still waiting to see outcome
- **Robins has worked toward separating processes**
  - Depainting processes are being colocated

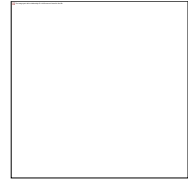


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# Control

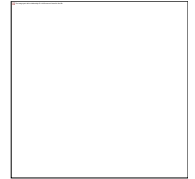
- **Control contamination at the source**
  - Hierarchy of controls is still applicable
  - Adequate controls will reduce housekeeping needs
- **HEPA vacuum is recommended for collection**
- **Wet cleanup methods also work well**
- **Primary controls are vents and HEPA vacuums**
  - Ventilation helps prevent spread of dusts
  - HEPA vacuums control dusts before release
  - Ventilated sanders and attached cowls are ideal

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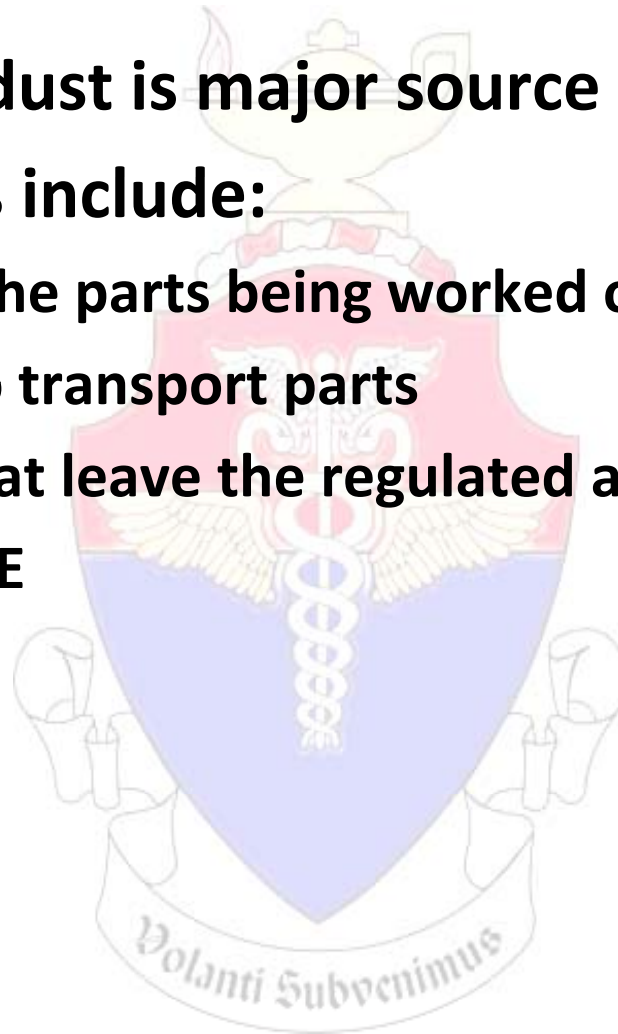
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# Housekeeping

- **Heavy metal dust is major source of contamination**
- **Other sources include:**
  - **Removal of the parts being worked on**
  - **Carts used to transport parts**
  - **Personnel that leave the regulated area**
  - **Tools and PPE**

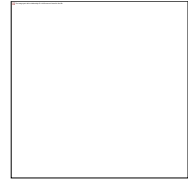


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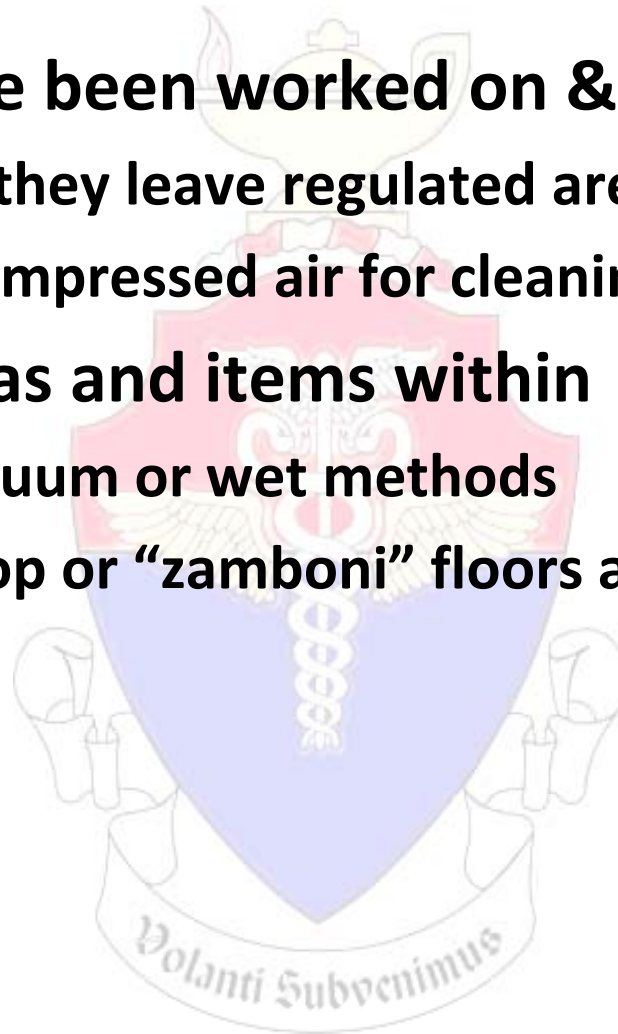
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# Housekeeping

- **Parts that have been worked on & parts transport carts**
  - Clean before they leave regulated area
  - Do not use compressed air for cleaning
- **Regulated areas and items within**
  - Use HEPA vacuum or wet methods
  - Wet wipe, mop or “zamboni” floors and surfaces



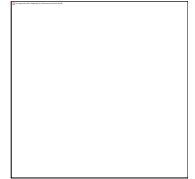
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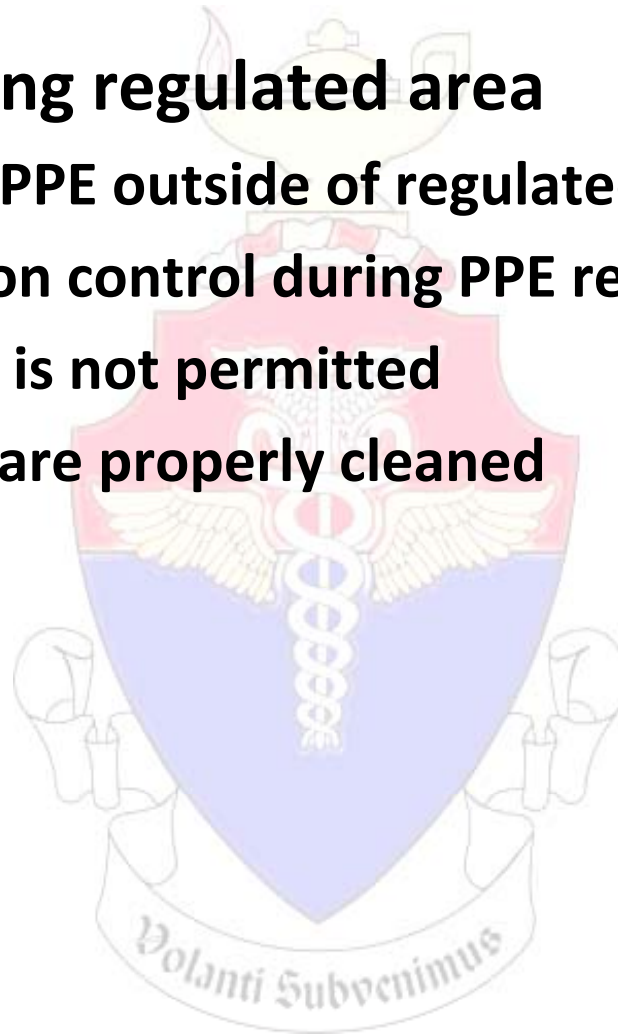
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# Housekeeping

- **Workers leaving regulated area**
  - Do not wear PPE outside of regulated area
  - Contamination control during PPE removal
  - Reuse of PPE is not permitted
  - Ensure tools are properly cleaned

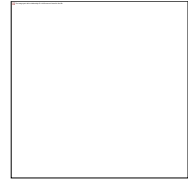


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# Housekeeping

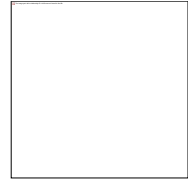
- **May need to clean non-regulated areas**
  - Will depend on nature of contamination spread
- **Pay special attention to break/lunch areas**
  - PPE of any type should not be permitted
- **Appropriate cleaning frequency is difficult**
  - Will depend on sampling and feasibility
- **Work center housekeeping plan is needed**
  - Identify what and how often to clean

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# Verification

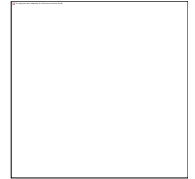
- **Verify implementation of housekeeping plan**
  - Review house keeping logs
  - Visual “white glove” method
  - In select situations: swipe sampling
- **OSHA has required Robins to perform sampling**
  - As part of close out: 6 samples at each shop
  - Robins identified 38 applicable shops
  - 6 weeks weekly sampling = 1368 swipes
  - AF does not recommend for other bases

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# Sampling

- **Swipes are one method of sampling**
  - Can inform a health risk assessment
  - Can inform decision on need for housekeeping
- **4 types of swipe sampling**
  - Targeted
  - Rate of deposition
  - General characterization
  - Determine contamination spread

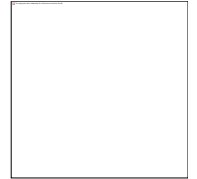


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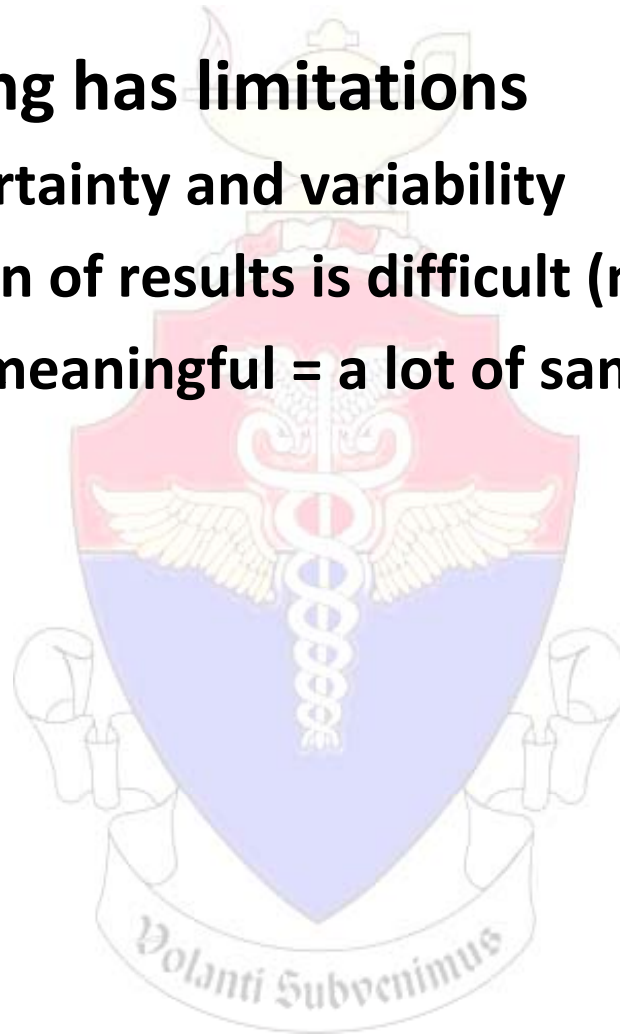
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# Sampling

- **Swipe sampling has limitations**
  - A lot of uncertainty and variability
  - Interpretation of results is difficult (no standards)
  - Statistically meaningful = a lot of samples

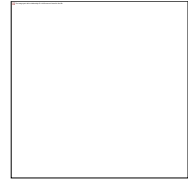


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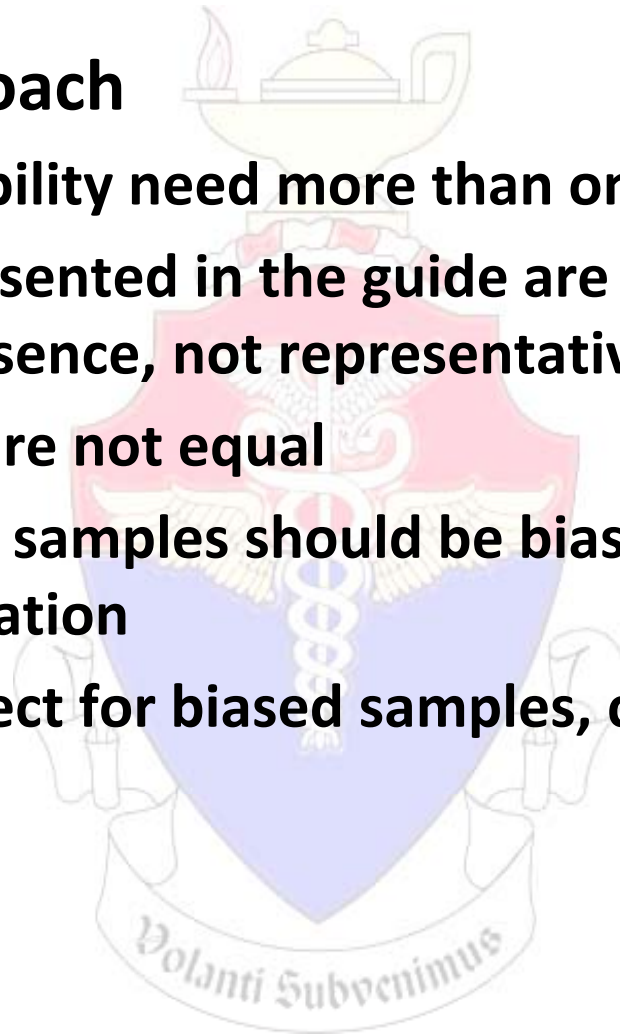
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# Sampling

- **General approach**
  - Due to variability need more than one sample
  - Methods presented in the guide are screening or presence/absence, not representative or “clearance”
  - All samples are not equal
    - Screening samples should be biased to find contamination
    - If nondetect for biased samples, contamination not an issue

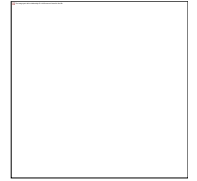


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# Current/Future Work

- Determine homogeneity of deposition
- Evaluate contamination spread (How far?)
- XRF methods for sampling
- Looking to evaluate cleaning methods

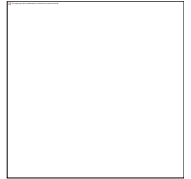


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# Questions?



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