



**U.S. ARMY CHEMICAL MATERIALS AGENCY**  
CREATING A SAFER TOMORROW

# Chemical Weapons Demilitarisation Conference

14 – 18 May 2007

## Mustard Processing at Tooele

Tim Baker on behalf of Trace Salmon

- Early Ton Container Sampling
- Mustard Campaign Challenges
- Mustard Campaign Solutions
- Permitting Approach
- Mercury Monitoring
- Site Status

- Early Sampling in 2003
  - Permit requirement to characterize mustard feed
  - Sampled liquid, solid “cohesive” heel, and “non-cohesive” sludge layer in 98 mustard ton containers
  - Liquid analyzed for metals, agent purity, organics
  - Solids and sludge analyzed only for metals
  - Headspace sampling identified hydrogen pressurization
  - Identified mercury contamination

- **Mercury Contamination**
  - Mercury not removed by TOCDF Pollution Abatement System (PAS) wet scrubber
- **Heavy Heels**
  - Draining
  - Metal Parts Furnace (MPF) capacity and tuning
- **Hydrogen Pressurization**
  - Potential explosive atmosphere
- **Change of Decontamination Solution**

## Mustard Campaign Solutions

- Mercury Contamination
  - 100% sampling of mustard ton containers (TCs)
  - Processing of only TCs with <PQL in mustard liquid
  - Alternative Monitoring Request approval for MPF mercury emissions monitoring
  - PAS Filtration System (PFS) for elevated-mercury mustard ton processing



## Mustard Campaign Solutions

- Heavy Heels
  - Depth Gauge during sampling
  - MPF capacity and tuning
- Hydrogen Pressurization
  - 100 % sampling vents pressure
- Selection of Decontamination Solution
  - Bleach vs Whistle<sup>®</sup>/water



- EPA - Alternative Monitoring Request for Metal Parts Furnace
  - MACT requirement for feedstream analysis
  - Alternative - Monitor emissions vice feedstream
  - 130  $\mu\text{g}/\text{dscm}$  MACT mercury emission limit
  - 12-hr roll
  - Appendi
  - sorbent
  - Stringen
  - test

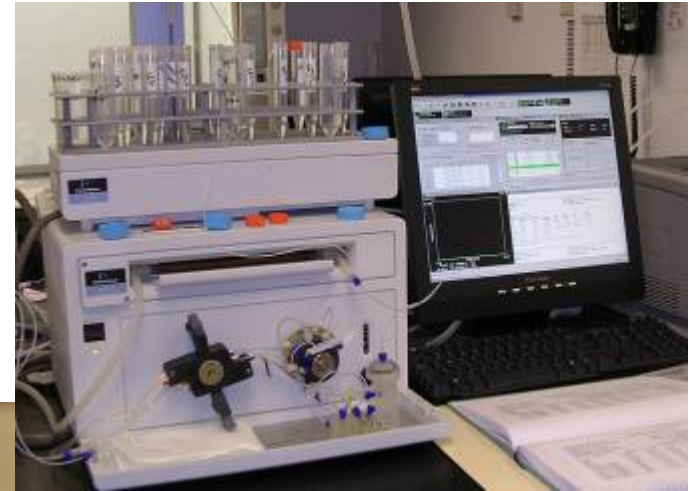


- DSHW – RCRA Permit Mods
  - Mustard Class 3 Mod
    - For low-mercury tons only
    - LIC and MPF Agent Trial Burn Plans
    - 100% Feed Rate after submittal of Notice of Compliance (3 Months)
  - Mustard Agent Monitoring Plan Class 2 Mod
    - Very limited multi-agent monitoring
    - Remove GB monitoring
  - Decontamination Solution Class 2 Mod
    - Replace bleach with Whistle<sup>®</sup>/water

- **DAQ – MACT – Title V Air Permit**
  - No Title V Air Permit modification required for low mercury
  - Define mustard processing parameters in trial burn plan
  - Criteria for increasing mustard feed rate to 100% after trial burn
  - Notice Of Compliance will incorporate mustard processing parameters after trial burn

- **Successful and Timely Start of Mustard Ton Container Processing at TOCDF**
  - Early strategic decisions
  - Proactive coordination with regulatory agencies
  - Innovative approaches to solving mustard challenges
  - Timely approval of modifications
  - TOCDF ability to meet 45% Treaty milestone

- Compliance Monitor
  - EPA Method 29 Sorbent Trap
    - Zeeman Spectroscopy
- Process Monitor
  - Ohio Lumex
    - Cold Vapor Atomic Adsorption



- ✦ **First-of-a-kind applications**
  - High humidity matrix
  - Broad range variable emissions

- Sampling of mustard TCs began June 6, 2006
  - 2301 of 6397 TCs have been sampled and analyzed as of April 1, 2007
  - 88% percent have low mercury levels
- TOCDF began processing mustard TCs on August 18, 2006
  - Processed 908 TCs as of April 1, 2007



- **As of 1 April, 2007:**
  - 8218.1 tons (7455.3 tonnes) of agent destroyed
  - 1,015,048 munitions destroyed
- Since beginning operations in 1996 TOCDF has destroyed on average over 100,000 munitions per year.



Questions?