Overview of CDC’s Chemical Weapons Disposal Oversight Program

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Unless otherwise noted, all photographs are courtesy of the Chemical Materials Agency and the U.S. Army
“Whether or not gas will be employed in future wars is a matter of conjecture. But the effect is so deadly to the unprepared that we can never afford to neglect the question.”

– General “Blackjack” Pershing, 1919
History of Chemical Warfare*

- 431-404 BC: Use of arsenic smoke during Peloponnesian war.
- 673 AD: First use of “Greek fire” at the siege of Constantinople.
- 1899: International peace conference held in The Hague leads to an agreement prohibiting the use of projectiles filled with poison gas.
- April 1915: Chlorine gas attack at the battle of Ypres, Belgium (WWI).
- July 1917: First use of mustard gas at the second battle of Ypres.
- 1918: By the end of WWI, the use of over 100,000 tonnes of toxic chemicals during the war had resulted in the deaths of 90,000 soldiers, and had caused more than a million casualties.
- 1925: Geneva Protocol is concluded. This treaty bans the use of both bacteriological and chemical weapons but is not enough to stop countries from producing, using and stockpiling chemical weapons thereafter.

*Source: Organisation for the Prohibition of Chemical Weapons (OPCW)
History of Chemical Warfare*

- 1993: The Chemical Weapons Convention is opened for signature at a January signing ceremony in Paris; 130 countries show support for the CWC and for international disarmament by signing the Convention. In February 1993, a Preparatory Commission is set up in The Hague to prepare for the entry into force of the Convention.
- 1995: In Japan, the Aum Shinrikyo cult releases the chemical agent sarin in a terrorist attack on the Tokyo subway. About 5,000 people become sick and a dozen are killed.
- 1997: The Chemical Weapons Convention enters into force for 87 member countries. The Organisation created by the Convention to carry out the terms of the Convention, the Organisation for the Prohibition of Chemical Weapons (OPCW), opens its headquarters in The Hague.

*Source: Organisation for the Prohibition of Chemical Weapons (OPCW)*
Public Outcry Against Chemical Weapons

- Several events led to public opposition of chemical weapons in 1969-1970
Congressional Mandates

- Public law requires CDC to review “particulars and plans” associated with transportation and disposal of lethal chemical warfare materials to ensure that public health and safety is adequately protected
  - Public Law 91-121 (November 19, 1969) as amended by 91-441 (October 7, 1970) was passed as a result of public opposition
  - Public Law 99-145 (November 8, 1985)
International Treaty Obligations

- **Chemical Weapons Convention**
  - In force April 29, 1997
  - Prohibits development, production, stockpiling, and use
  - Stockpile, non-stockpile, recovered weapons, and production facilities

- **Milestones**
  - 45% destroyed by April 29, 2007
  - Treaty called for 100% destroyed by April 29, 2007
    - Extended 5 years to 2012
  - Production facilities destroyed by April 29, 2007
Mission Statement

To protect public health and safety by reviewing, advising, and making recommendations on the safe disposal and transportation of stockpile and non-stockpile chemical warfare agents.

Emphasis is on prevention with vigilance
Army Disposal Approaches

- **Burial**
  - Spring Valley

- **Open Pit Burning**
  - German Traktor rockets, Pine Bluff (1948)

- **Dumping at Sea**
  - Operation CHASE (Cut Holes and Sink Em)

- **Incineration**
  - Original plan for all domestic sites and Johnston Atoll

- **Neutralization**
  - Advocated by environmental groups and applied to four sites
What We Do

- Evaluate engineering and procedural safeguards
- Review medical readiness
- Evaluate agent monitoring systems
- Partner with public health professionals
Chemical Agents

- **Nerve:** GA (tabun), GB (sarin), and VX
  - Inhibit cholinesterase
- **Vesicants:** H, HD, HT (sulfur mustard); L (lewisite)
  - Irritants, alkylating agents
Stockpile Program

- 63 million pounds at 9 sites
- 56 million pounds destroyed (89%)
- All to be destroyed by 2012
- Last 2 sites represent 10% of the stockpile
  - Pueblo, Colorado: 8%
  - Bluegrass, Kentucky: 2%
  - Should finish between 2017 and 2024
U.S. Chemical Weapons

9 Original Stockpile Storage Sites

- Umatilla, OR: 3,717 tons
- Pueblo, CO: 2,611 tons
- Newport, IN: 1,269 tons
- Tooele, UT: 13,616 tons
- Pine Bluff, AR: 3,850 tons
- Blue Grass, KY: 523 tons
- Johnston Atoll: 2,031 tons
- Anniston, AL: 2,254 tons
- Edgewood, MD: 1,625 tons

9 Original Stockpile Storage Sites
Locations and Status of Nine Original Stockpile Sites

Umatilla, OR
Pueblo, CO
Newport, IN
Edgewood, MD
Tooele, UT
Blue Grass, KY
Anniston, AL
Johnston Atoll
Pine Bluff, AR

Under Construction
In Operation
In Closure
Closed
U.S. Chemical Weapons

Non Stockpile Burial Locations
100 suspect locations
40 states
2 U.S. territories
Containers Moved from Storage

Munitions separated by automated equipment

Explosives and rocket pieces incinerated in deactivation furnace

Pollution abatement system

Liquid chemical agent incinerated in liquid incinerator

Pollution abatement system

Metal components thermally cleaned in a metal parts furnace

Pollution abatement system

Emissions monitored and released out common stack

Pollution abatement system
Containers Moved from Storage

Containers Drained

Liquid chemical agent hydrolyzed in reactor

Water & NaOH

Treatment of Hydrolysate on site or at Permitted, Off-Site Commercial Facility

Treated waste discharged

Munitions Moved from Storage

Munitions separated by automated equipment

Explosives and rocket pieces hydrolyzed in reactor

Metal components thermally cleaned in a metal parts treater

Pollution abatement system

Emissions monitored and released out stack
Anniston Chemical Agent Disposal Facility Completes Chemical Stockpile Destruction

Disposal of stockpile stored at Anniston Army Depot completed September 22, 2011

- Destruction operations began August 9, 2003, to safely destroy 7% of the original U.S. stockpile of chemical munitions and containers
- Original inventory of chemical weapons included 661,529 nerve agent and mustard agent munitions and 2,254 tons of chemical agent
Johnston Atoll Chemical Agent Disposal System (JACADS) Beginning to End
NSCMP Mission Since October 1992

- Provide centralized management and direction to the Department of Defense (DoD) for disposal of Non-Stockpile Chemical Materiel (NSCM) in a safe, environmentally sound, and cost-effective manner
Explosive Detonation System Operation
Case Studies

- Spring Valley
- ESS Pursuit
Spring Valley Project

- Excavation of the S. Korean ambassador’s backyard
- WWI vintage chemical warfare materials found
American University Experiment Station, Circa 1918
ESS Pursuit Incident
Where Did DoD Conduct CWM Disposal Operations in U.S. Coastal Waters?

- Atlantic (11 sites): 52%
- Pacific (1 site): 35%
- Gulf of Mexico (2 sites): 1%
- Caribbean (1 site): 0%
- Alaska (1 site): 3%
- Hawaii (3 sites): 9%

Percentage based on Agent Weight

Approximately 27,000 metric tons (30,000 tons) of chemical agent was disposed in U.S. waters.

Data published in Defense Environmental Programs FY08 Annual Report to Congress (ARC), Appendix Q
Disposal Sites—Atlantic and Gulf

Source: Chapter 10, Sea Disposal of Military Munitions, FY 09 Defense Environmental Programs ARC
ESS Pursuit Incident

- **June 6: ESS Pursuit recovers WWI era munitions**
  - One munition falls off sorting table and breaks open
  - While tossing munition overboard 2 crew members are exposed

- **June 7: ESS Pursuit comes in to off load catch at Seawatch processing plant**
  - Exposed fisherman is transported to St. Luke’s Hospital with blisters
  - Approximately 06:00, a nurse at St. Luke’s Hospital identifies fisherman’s blisters as a sulfur mustard exposure

- **By midday June 7: Incident Command System established**
Lessons Learned – WILL THIS HAPPEN AGAIN?

- Massachusetts Department of Health representative said that during conversations with Captain and crew, the following statements had been made:
  - They recover munitions during every fishing trip
  - Approximately 50% of the munitions smell of garlic (an indication of a ruptured munition)
  - The fishermen have painted rocks and tossed them overboard with other refuse and have then retrieved the same rock on subsequent fishing trips in the same area
For more information please contact Centers for Disease Control and Prevention
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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

We Are on the Web
http://www.cdc.gov/nceh/demil