



U.S. ARMY CHEMICAL MATERIALS AGENCY

Safe Disposal of Secondary Waste

The U.S. Army Chemical Materials Agency (CMA) works with federal and state environmental regulators to dispose of chemical weapons safely. An important part of CMA's work is managing secondary wastes generated through chemical weapons storage and disposal processes in compliance with all applicable laws.

CMA is committed to using the safest and most efficient processes to handle, treat, transport and dispose of its secondary waste—safe for our workers, the public and the environment.

What is secondary waste?

Secondary waste includes any waste generated from chemical agent storage or destruction. It includes items such as personal protective equipment, insulation, cleaning materials, equipment parts such as gaskets and hose charcoal filters, used hydraulic fluid, decontamination solutions, refractory

brick, brines and some wastewaters. Secondary wastes can be hazardous or non-hazardous and may have low-level agent contamination.

Secondary waste from chemical weapons stockpile disposal operations

Destruction of chemical weapons and munitions at disposal facilities generates secondary waste such as metal parts from drained munitions, laboratory wastes or spent decontamination solution from treating agent-contaminated equipment. These wastes may be designated as either hazardous or non-hazardous like other industrial wastes. An example of hazardous waste is furnace ash contaminated with heavy metals. Non-hazardous wastes include such items as decontaminated steel containers, wood pallets and munition casings. The chart below shows the types of secondary waste and their classifications:

Chemical Agent Disposal Process Waste Product	Classification
Metal and metal parts from treated agent-filled munitions and containers	Depending on the state-issued permit, it may be non-hazardous or hazardous waste and will be recycled as allowed
Ash, slag and residues from incineration furnaces	Hazardous waste, if it contains heavy metals and depending on the state where it originated, may be a state-listed hazardous waste
Brine salts, brine sludge and dust (particulates) from pollution control systems that clean incineration furnace emissions	Hazardous waste—state listed
Personal protective equipment worn by workers, such as gloves and suits	Hazardous or non-hazardous waste, as determined by either laboratory analysis or where and how it was used—state listed
Wood pallets, overpack containers and other storage-related equipment and supplies	Hazardous or non-hazardous waste, as determined by either laboratory analysis or where and how it was used—state listed
Laboratory wastes	Hazardous or non-hazardous waste depending on where and how it was used—state listed

For more information, contact the CMA Public Affairs Office at (410) 436-3629 (800) 488-0648

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Safe Disposal of Secondary Waste (continued)

Secondary wastes from routine maintenance and facilities/equipment repairs

Managing the nation's chemical weapons storage and disposal processes is an industrial activity. Workers regularly inspect, maintain and repair facilities and equipment at storage and disposal facilities to allow continued, safe operations. Depending on the equipment or area, maintenance wastes may be contaminated with chemical agent and handled accordingly.

Typical wastes from maintenance and repair activities include:

- Used oils and other lubricants
- Used hydraulic fluid
- Used solvents
- Used paints and paint supplies
- Used personal protective equipment
- Worn-out parts and equipment

Handling, treatment and disposal of CMA's secondary wastes

CMA's secondary wastes are identified and tightly regulated through the operating and hazardous waste storage permits issued by each state's environmental agency. Details of those permits include storage conditions, time limits, handling and final disposal of all wastes. Designed in close consultation with state and federal regulatory agencies, CMA's chemical weapons storage and disposal facilities and processes ensure that waste amounts and toxicity are minimized and that waste management practices do not pose harm to the public, the workers or the environment.

For more than a decade, CMA has treated some of its secondary wastes on site at its facilities. During this same time frame, and as allowed by permit, CMA has also contracted with approved and permitted Treatment, Storage, and Disposal Facilities (TSDFs) to safely transport and dispose of some of the secondary wastes generated from agent storage and destruction.



Workers in personal protective equipment safely inspect and handle secondary wastes inside a CMA chemical weapons disposal facility.

Safe Disposal of Secondary Waste (continued)

The safe destruction and disposal of these wastes is controlled by the U.S. Environmental Protection Agency (EPA) and state and local regulations and permits. Transportation of the secondary wastes from treatment and disposal is controlled by the EPA, U.S. Department of Transportation (DOT) and the sites' state-awarded permits.

The specific treatment and disposal method for any CMA secondary waste is selected based upon decades of research and experience, and on the maturity of the technology—with the health and safety of the workers, public and environment in mind. CMA is committed to using the safest and most efficient processes, on or off site, to handle, treat and dispose of its secondary waste. CMA will only ship secondary waste off site for treatment and disposal after applicable regulatory and oversight organizations confirm that off-site treatment of secondary waste is safe, proven, mature and efficient.



Secondary waste in the process of being triple-bagged and packaged in tightly sealed containers that meet Department of Transportation standards.



Secondary waste ready to process through the metal parts furnace.

Secondary waste treatment and/or disposal on site

Examples of on-site treatment of secondary waste at CMA sites include:

- The Hot Water Decontamination Unit previously used at the former Aberdeen Chemical Agent Disposal Facility in Maryland. It used agitated water at a temperature of 190 degrees to decontaminate metal parts.
- At CMA's facility in Utah and at the former sites in Arkansas, Alabama and Oregon, operators used decontamination solutions in the secondary chambers of liquid incinerators.
- In Utah, the demilitarization protective ensembles, a totally encapsulating protective suit worn by maintenance workers in the most toxic areas of the plant, are decontaminated in the Materiel Decontamination Chamber (MDC). The MDC heats the suits and destroys any agent contamination. The suits are then trash compacted into 55-gallon drums and sent off site to a permitted hazardous waste landfill.
- At CMA's incineration technology sites—facilities in Utah (and the former sites in Arkansas and Alabama)—the metal casings of the drained GB nerve agent munitions were thermally cleaned in Metal Parts Furnaces and then sent off site for recycling. At CMA's former incineration technology site in Oregon, the metal casings of the drained GB nerve agent munitions were thermally cleaned and then sent to a permitted hazardous waste landfill. The recycling of metal casings drained of VX nerve agent or mustard agent varied from site to site depending upon the site's permit.



Safe Disposal of Secondary Waste (continued)

- CMA's incineration-technology sites also process other secondary wastes through the metal parts furnaces. The treated wastes are tested to ensure they are decontaminated and then sent off site to a permitted hazardous waste landfill.
- Where required by permit, CMA treats its Pollution Abatement System scrubber brine on site with a steam drying process. The brine or resulting salts, depending on the site's permit requirements, are tested to ensure no agent contamination and the resulting salts are packaged and sent off site to a permitted hazardous waste landfill.
- Depending upon the state's permit for the CMA disposal facility, uncontaminated wood pallets may be shredded or chipped on site and used for mulch or sent off site for landfill.
- Incineration slag—a glass-like material formed inside the liquid incinerators from burning spent decontamination solutions—and refractory brick from the linings of the incinerators are sent off site from treatment and disposal in an approved landfill.

Recycling

Drained metal casings are cleaned and then, depending upon the site's permit requirements, recycled or placed in a hazardous waste landfill. CMA also recycles other secondary wastes as part of its waste minimization efforts. Materials that are recycled include office materials (cardboard, paper, aluminum cans), lead-acid batteries, used oil and waste fuels.

Secondary waste treatment and/or disposal off site

Examples of off-site treatment and disposal of CMA's secondary wastes include:

- Ash and debris from the Deactivation Furnace Systems are treated off site for small amounts of lead and then placed in permitted hazardous waste landfills.
- CMA ships its Pollution Abatement System scrubber brine off site for treatment at permitted TSDFs, where allowed by permit.
- Most decontaminated metal munition casings are sent off site for recycling.
- Uncontaminated wood pallets are shipped off site for disposal at appropriate landfills (Oregon requires the pallets be treated as hazardous waste), Where required by permit.



Workers at a Chemical Agent Disposal Facility prepare secondary waste for off-site treatment and disposal.

Tradition of Safety

CMA's work at the chemical agent storage and disposal facilities around the country has demonstrated that CMA stores, transports, disposes and treats secondary wastes safely.

Throughout the history of chemical weapons storage and disposal, CMA has adhered to the stringent and closely regulated EPA and DOT standards used by the hazardous waste materials industry for the treatment, transport and disposal of our secondary wastes under close oversight of the EPA, Centers for Disease Control and Prevention, and state environmental and regulatory agencies. CMA remains committed to working with these oversight agencies to manage all secondary wastes in accordance with existing regulations and permits for the safety of our workers, communities and the environment.



Drums are securely packaged in preparation for transport to off-site treatment and disposal facilities.