

Liquid Incinerator

Background

In February 1997, the Environmental Quality Commission, the DEQ's governing body, issued environmental permits to the U.S. Army to build and operate the Umatilla Chemical Agent Disposal Facility (UMCDF) to destroy the chemical weapons stockpile currently stored at the Umatilla Chemical Depot (UMCD) near Hermiston, Oregon.

The Umatilla Chemical Depot stores nerve agents and blister ("mustard") agents in liquid form. Nerve agents are contained in munitions, such as rockets, projectiles and land mines, and in large containers, such as spray tanks, bombs, and "ton containers." Mustard agent is stored in ton containers. All of the chemical warfare agents are highly toxic.

Destruction of the various munitions requires different types of furnaces. UMCDF has three different furnace types, including two Liquid Incinerators (LICs), a Deactivation Furnace System (DFS), and a Metal Parts Furnace (MPF).

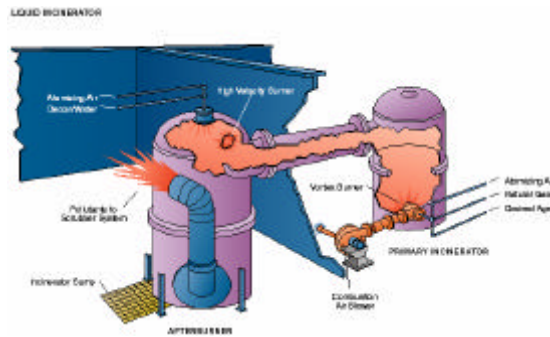
What waste is burned in the LIC?

The Liquid Incinerators (LIC) are designed to incinerate the three types of chemical agent present at the UMCD (GB, VX and Mustard), as well as spent decontamination solution and other wastes. It was designed specifically for the demilitarization facility to burn agent, surrogate material during testing and spent decontamination liquid from cleanup activities.

The primary purpose of the Liquid Incinerators LIC#1 and LIC#2 (these furnaces are independent, identical systems) is to destroy the liquid chemical agent which is drained and removed from the various chemical munitions during the demilitarization process. They are also used to destroy chemical agent contaminated (or potentially contaminated) liquids which are generated from cleanup and decontamination activities.

How is the waste fed into the LIC?

During the demilitarization process agent is drained from the munitions and stored in the Agent Collection System. The agent is then pumped into the LIC primary chambers to be burned. Decontamination solutions collected in the Spent Decontamination System (SDS) tanks are pumped to the LIC secondary chambers to be burned.



How does the LIC work?

The chemical agent is pumped through piping from accumulation tanks in the Facility to the LIC primary chamber where it is "sprayed" into the incinerator by injection nozzles and burned. The temperature in the primary chamber is 2500?-2700? F. The exhaust gases from the combustion process flow out of the primary chamber through ductwork and into the secondary chamber where they are further burned along with spent decontamination solution that is sprayed into the chamber. The temperature of the secondary chamber is approximately 2000? F. The gases from the whole system are then exhausted out to the LIC Pollution Abatement System (PAS) and monitored before being released from the stack. The PAS is a wet scrubber system that uses water and chemicals to cool the gases and remove pollutants.

What's left over after the LIC process?

Operation of the LIC generates very few types of waste. The largest waste stream is referred to as LIC slag. This is a glassy looking solid "rock".

Slag is generated in the secondary chamber of the LIC from the burning of the spent decontamination solution. The amount of slag generated depends on the chemical characteristics and impurities in the spent decontamination liquids.

The other major waste stream is the actual lining of the LIC itself. Both the primary and secondary chambers (and the duct between them) are lined with an insulating brick, which is referred to as refractory brick. This lining helps keep the high temperatures and heat inside the furnace. The lining may wear out over time causing it break apart. If this occurs it is removed and replaced. The old brick is then treated and disposed.



State of Oregon
Department of
Environmental
Quality

Office of the Director Chemical Demilitarization Program

256 E. Hurlburt Ave
Hermiston, OR 97838
Phone: (541) 567-8297
(800) 452-4011
Fax: (541) 567-4741
Contact: Ann Mayes
DEQ Item No. 03-0335

www.deq.state.or.us

All wastes, including residues from the furnaces, must be certified as “agent-free” prior to off-site shipment.

LIC role in Facility

The LIC is the incinerator that destroys most of the liquid pure agent and the associated liquid wastes. The other incinerators handle solid material after it has been drained of agent and may have residue agent on it.

The LIC is also tied into the Spent Decontamination System. This system collects all the rinse water and miscellaneous liquids in the Facility in drainage areas and pipes and accumulates the liquid in tanks before it is pumped into the LIC to be destroyed.

The LIC must operate a large percentage of the time because there is only limited tank storage

capacity for both the Agent Collection System and the Spent Decontamination System.

Where to get more information

Contact Ann Mayes at the DEQ office in Hermiston, 256 East Hurlburt (Suite 105) or call (541) 567-8297 ext. 25 (toll-free in Oregon 1-800-452-4011).

Alternative formats

Alternative formats of this document can be made available. Contact DEQ Ann Mayes at (541) 567-8297 ext. 25. People with hearing impairment may call DEQ’s TTY at (503) 229-6993.