Liquid Waste Processing Facilities

U.S. Department of Energy • Richland Operations Office

The 200 Area Liquid Waste Processing Facilities receive, treat, and dispose of liquid effluents from onsite programs and projects. Facilities include the Liquid Effluent Retention Facility (LERF), the 2025E Effluent Treatment Facility (ETF), the Treated Effluent Disposal Facility (TEDF), and the 242-A Evaporator.

The LERF is a RCRA permitted facility and consists of three basins with a usable capacity of about 88 million L (23 million gal). The LERF receives and temporarily stores wastewater from the 242-A Evaporator, groundwater from the site pump and treat projects, leachate from onsite solid waste disposal facilities and a variety of generators including site cleanup activities. From LERF, the water is routed to the ETF for treatment and disposal.

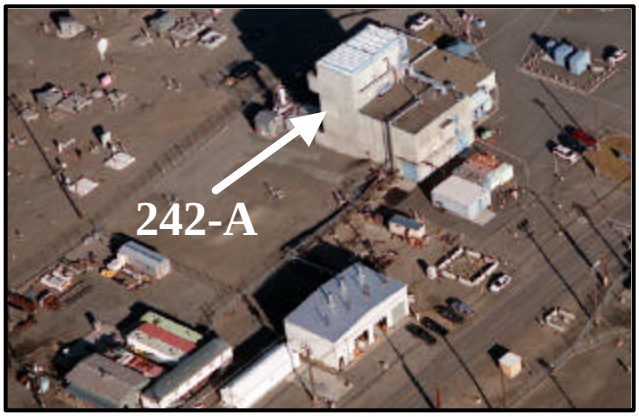
The ETF is a RCRA permitted treatment process has a design capacity 216 million L (56 million gal.) per year and removes hazardous and radioactive contaminants. The ETF treatment process includes filtration (removal of suspended solids) ultraviolet light/peroxide (destruction of organics), reverse osmosis (removal of dissolved solids), and ion exchange (radioactivity removal). Storage tanks hold the treated effluent for verification of acceptable discharge levels, before the effluent is transferred to a state permitted land disposal site.

***Above**: The Liquid Effluent Retention Facility (LERF). **Below**: Effluent Treatment Facility.*

The TEDF is a collection and disposal system for non-hazardous, non-radioactive waste streams.

Quick Facts

Facility	Purpose
Liquid Effluent Retention Facility	Receipt and storage of wastewater from various site locations
Effluent Treatment Facility	Removal of hazardous and radioactive contaminants, including organics
Treated Effluent Disposal Facility	Collect and route non-hazardous, non-radioactive waste streams to disposal
242-A Evaporator	Concentrate high-level waste to reduce tank farm storage needs



__Left__: 242-A Evaporator. __Below__: Tanker used to transport liquids for treatment.

The TEDF includes more than 19 kilometers (12 miles) of polyvinyl chloride pipe up to 36 centimeters (14 inches) in diameter connecting facilities to a second state-permitted land disposal site. The TEDF has a capacity of 13,000 L (3,400 gal) per minute, equivalent to 6.8 billion L (1.8 billion gal) per year. The final disposition of this waste is the State Approved Land Disposal Site (SALDS)

The 242-A Evaporator is a RCRA permitted facility and concentrates River Protection Project (RPP) tank waste to reduce the overall storage requirements. The facility has a volume reduction capacity of 270,000 L (70,000 gal) per day. The concentrated waste is returned to the RPP waste tanks and the process condensate is transferred to the LERF.

__Above__: Effluent Treatment Facility reverse osmosis system. __Left__: The Treated Effluent Disposal Facility state approved land disposal site. (SALDS)

Historical Note

The U. S. Department of Energy's Richland Operations Office owns the Hanford Site in southeastern Washington State. Hanford was established during World War II as part of the top secret Manhattan Project to produce plutonium for nuclear weapons. Weapons material production was halted in the late 1980's. The Hanford Site is now engaged in the world's largest cleanup effort to deal with the legacy of radioactive and hazardous wastes that resulted from the plutonium production era. Hanford's cleanup program is regulated by the U. S. Environmental Protection Agency and the Washington Department of Ecology under a long term compliance contract called the Tri-Party Agreement. This agreement sets the framework and timelines on the cleanup work so that Hanford meets current environmental standards. The 200 Area Liquid Processing Facilities have an important role in meeting these environmental laws and standards.