



Vitrification Facility Demolition



Vitrification Facility

The West Valley Demonstration Project's (WVDP) Vitrification Facility was used to solidify radioactive liquid high-level waste (HLW) that was stored at the WVDP.

Facility Construction

- Constructed and operated in the 1980s as a non-radioactive testing area for the vitrification melter
- Following successful completion of melter testing, the facility was expanded and converted to a full-scale remotely operated vitrification facility
- 10,700 square foot reinforced concrete structure, 133 feet long by 102 feet wide
- Approximately 50 feet tall, with walls that range from 2-4 feet thick

Vitrification Facts

- The WVDP Vitrification Facility is one of only two such facilities to operate in the U.S.
- During its operation, it achieved the highest operational availability of any vitrification facility in the world
- More than 25 million curies of highly radioactive material was safely vitrified at the WVDP
- Following vitrification completion, the facility was shut down, making it the first facility of its kind in the U.S. to complete its mission
- 275 10-foot-tall production canisters of vitrified HLW were produced at the WVDP between 1996 - 2002, with radiologic dose rates ranging from 1,100 to 7,460 R/hr each

Facility Deactivation

- Approximately 15,000 cubic feet of equipment and materials was removed from the facility to prepare it for demolition, including three large, significantly contaminated components
- Only 1 gram of radioactive material remained in inaccessible areas of the facility prior to demolition



The Vitrification Facility was used at the WVDP to vitrify radioactive HLW into glass.

Demolition of the Vitrification Facility is a major component of the CH2M HILL BWXT West Valley, LLC (CHBWV) workscope at the WVDP. Extensive planning and preparation was performed to prepare for demolition. It is expected to take about eight months to demolish and dispose of the above-grade portions of the building.

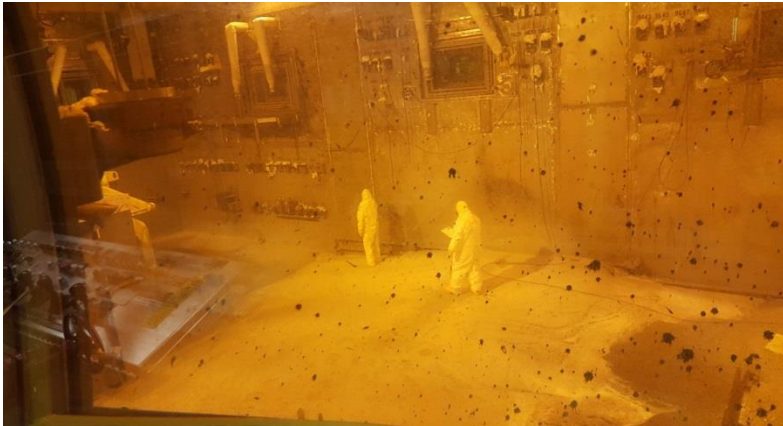
The facility contained radiological and hazardous contaminants as a result of HLW vitrification activities that were performed inside the structure. To prepare for demolition, all major process equipment was removed, interior surfaces were decontaminated and sealed, all utilities and connections with adjoining structures were disconnected, and characterization data was obtained to plan for demolition and waste disposal.

Working from the outside inward, demolition operators will use heavy equipment to size-reduce the structure in sections. Waste will be managed by loading it into waste containers staged at the demolition site. The debris will be low-level waste (LLW), which will be disposed off site at a federal waste disposal facility.

Despite the small quantity of remaining radioactivity, all activities will be conducted in accordance with state, federal and regulatory requirements. Controls will be in place during demolition to prevent the spread of contamination. Ambient air monitoring will be conducted at several locations surrounding the WVDP, to verify there are no off-site releases of radiological contamination. Real-time air monitors will also be in place adjacent to the facility throughout active demolition.



Vitrification Facility Demolition



Left: Radiological deactivation workers investigate conditions inside the Vitrification Cell as part of demolition planning. A layer of grout was placed on the floor to reduce exposure for workers. At right, an operator applies spray fixative in the Crane Room to immobilize contamination prior to demolition.

Demolition of the Vitrification Facility at the WVDP will be performed open-air by trained operators using heavy equipment. All aspects of work were planned to ensure safety and compliance with state, federal and regulatory guidelines and to protect workers, the public and the environment.

Facility Preparation

Extensive facility decontamination and deactivation performed prior to demolition, including:

- Removing nearly all equipment, piping and radiologic source material from the facility
- Performing decontamination of cell surfaces (walls and floor, prior to grouting)
- Closing all embedded openings into the Vitrification Cell with expandable foam sealant and applying fixative to seal any remaining contamination
- Placing a layer of grout on the floor to reduce worker exposure and prevent water infiltration
- Performing characterization surveys inside the facility to confirm radiological conditions prior to demolition
- Physically isolating the facility from adjoining structures by severing and air-gapping electrical and mechanical interfaces

Demolition Project Safety

The Vitrification Facility demolition plan is modeled after the successful demolition of the 01-14 Building at the WVDP. Demolition of the 01-14 Building demonstrated safe, open-air demolition of a contaminated structure. Key components include:

- Extensive removal of radioactive material
- Secure demolition area boundary with access limited to involved personnel
- Structural evaluation performed and used to develop a detailed work sequencing plan
- Dust-suppression equipment deployed during demolition to reduce the potential for airborne contamination
- Water management barriers in place to manage demolition site runoff
- Real-time radiological air monitors within the demolition site and ambient air monitoring at 16 off-site perimeter locations
- All WVDP workers have Stop Work authority if a condition appears unsafe

Schedule and Waste Disposal

- Demolition is planned to begin ahead of schedule in August-September 2017
- ~ 6,700 tons of LLW debris will be generated (~450 waste containers) and shipped off site to a federal disposal facility
- Approximately eight months to complete demolition and waste disposal

The West Valley Demonstration Project (WVDP) is a U.S. Department of Energy-led environmental remediation project located approximately 35 miles south of Buffalo, NY. CH2M HILL BWXT West Valley LLC, (CHBWW) was formed to meet the specific requirements of Phase 1 decommissioning of the WVDP. The limited-liability partnership combines the experience and capabilities of CH2M HILL Constructors Inc. (CH2M HILL), BWX Technologies, Inc. (BWXT), and Environmental Chemical Corporation (ECC).