Hanford Vit Plant

ANALYTICAL LABORATORY

January 2016

The Hanford Site, located in southeastern Washington state, was used to produce plutonium over 40 years, helping end World War II and playing a major role in defense efforts during the Cold War. As a result, 56 million gallons of radioactive and chemical wastes are now stored in 177 underground tanks on the Hanford Site. To address this challenge, the U.S. Department of Energy contracted Bechtel National, Inc., to design and build the world's largest radioactive waste treatment plant.

The Hanford Waste Treatment and Immobilization Plant, also known as the Vit Plant, will use vitrification to immobilize most of Hanford's waste. Vitrification involves turning the waste into a solid glass form that is stable and impervious to the environment. In this form, its radioactivity will dissipate over hundreds to thousands of years.

CONSTRUCTION FACTS

Size: 320 feet by 180 feet by 45 feet tall

Concrete: 12,000 cubic yards

Structural steel: 1,800 tons

Heating and ventilation ductwork: 314,500 pounds

Piping: 35,000 feet

Electrical cable: 172,000 feet

Craft hours to build: 635,000 hours

Lab

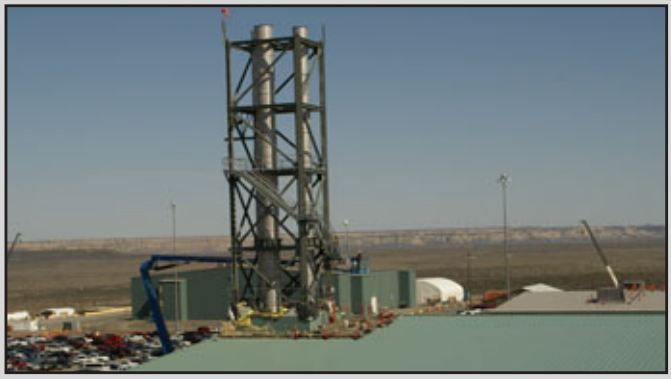
The Hanford Waste Treatment and Immobilization Plant will cover 65 acres with four nuclear facilities – Pretreatment, High-Level Waste Vitrification, Low-Activity Waste Vitrification and an Analytical Laboratory – as well as operations and maintenance buildings, utilities and office space.

The Analytical Laboratory, also known as the Lab, will serve as a process link between the Pretreatment, High-Level Waste Vitrification and Low-Activity Waste Vitrification facilities. The Lab is 320 feet long and 180 feet wide, approximately the size of a football field, and 45 feet, or four stories, high.

The Lab's key function is to ensure that all glass produced by the Low-Activity and High-Level Waste Vitrification facilities meets all regulatory requirements and standards. Each year the Lab will analyze approximately 10,000 waste samples.

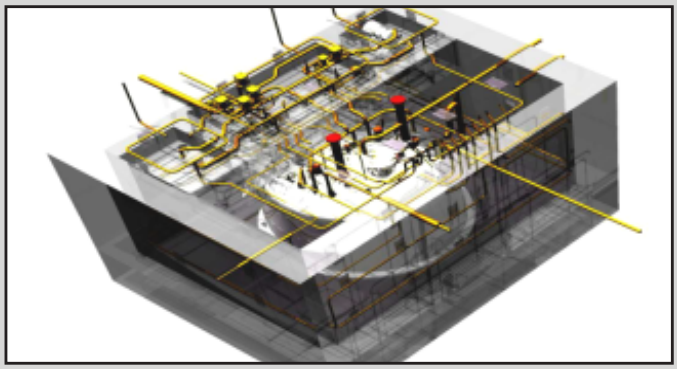
Samples will be used initially to confirm the correct glass-former "recipe" that will produce a consistent glass form. Once the recipe is identified, the glass-forming materials and the waste will be transferred to the Low-Activity Waste or High-Level Waste facility, as appropriate, for further processing. Samples will also be taken throughout the vitrification process to ensure a high-quality glass product and good process controls.

A CLOSER LOOK INSIDE THE ANALYTICAL LABORATORY



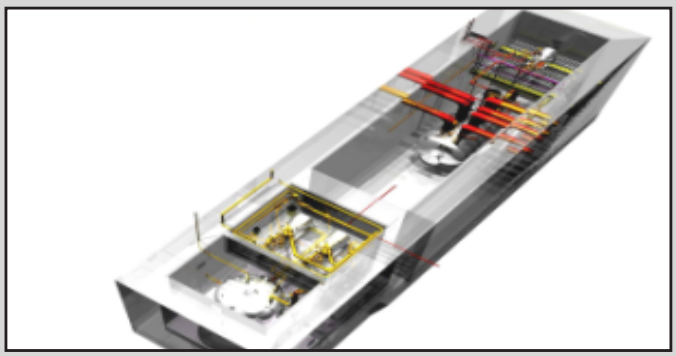
ENVIRONMENTAL EMISSIONS STACK ASSEMBLY

The 68-foot stack assembly will exhaust emissions from the Analytical Lab's ventilation systems, filtering radioactive and chemical contaminants from the air to ensure it meets strict regulations. Made of structural steel, the assembly contains three emission stacks and weighs approximately 140,000 pounds. The assembly sits atop the Analytical Lab, making it more than 119 feet tall.



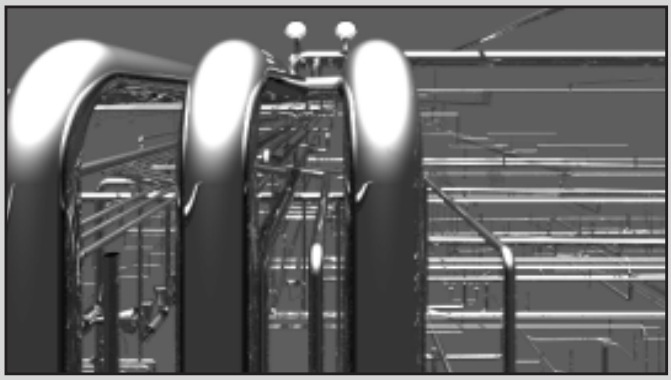
HOT CELL DRAIN COLLECTION VESSEL

The underground hot cell collection vessel is a collection, containment, staging, transfer and secondary containment area for waste streams from the analytical services. The vessel contents are recycled to the Pretreatment Facility.



DRAIN COLLECTION VESSELS CELL AND FIRE WATER VAULT

The floor and sink drain collection vessel also collects water overflow in the event of a fire. The area includes radioactive liquid discharge pumps, ventilation systems and specialized exhaust systems to prevent potential cross contamination among areas.



ABOVE GROUND AND EMBEDDED FOUNDATION PIPING

The Analytical Lab contains piping for drainage and waste transfer. Piping may be above ground; within underground cells and vaults; or embedded in the thick concrete foundation. All process piping is nuclear-grade stainless steel or Hastelloy and is installed to exacting specifications using the most advanced welding and installation techniques.