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OFFICE OF
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Core Sampling Helps Extend Service Life of Hanford Waste Tanks

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A crew with Office of River Protection tank farms operations contractor Washington River Protection Solutions sets up a work platform to take a core sample from double-shell Tank AN-101.

RICHLAND, Wash. – **EM's Office of River Protection** (ORP) and tank farms operations contractor Washington River Protection Solutions (WRPS) continue to advance a comprehensive program to ensure the structural integrity of the **Hanford Site's** underground waste storage tanks.

Through a process called “core sampling,” engineers collect waste from deep inside underground double-shell waste-storage tanks to gain valuable information, such as waste chemistry, corrosion rates, and the likelihood of “pitting,” in which small, deep holes are created, or stress corrosion cracking of the steel tanks. Workers collect samples of the tank solids and waste from selected waste layers, going as low as 1 inch from the bottom of the 47-foot-deep tank.

“The data obtained through core sampling helps develop or modify mitigation strategies designed to extend the service lives of double-shell tanks,” said ORP’s Erik Nelson, program manager with the tank farms program division. “The integrity of double-shell tanks ensures the continued safe storage of millions of gallons of waste and availability of tank space to support waste treatment operations.”

Hanford’s underground tanks store waste from more than four decades of plutonium production. The tanks are made of carbon steel and reinforced concrete. WRPS is retrieving and transferring waste from older single-shell tanks to more robust double-shell tanks. Each of the 27 double-shell tanks in service has a capacity of approximately 1 million gallons.

WRPS recently began collecting core samples from Tank AN-101, the fourth of Hanford’s double-shell tanks to be core sampled in the past two years. The samples are sent to Hanford’s **222-S Laboratory**, where scientists determine the waste makeup and perform electrochemical corrosion tests.

“Core sampling allows us to get what we really need: a vertical profile of the waste, including the waste in contact with the tank bottom,” said Ruben Mendoza, who manages the WRPS Tank and Pipeline Integrity Program. “In addition, the data is used to update waste composition estimates, verify criticality safety, and aid in long-term strategic mission planning.”

Criticality safety is the prevention of nuclear and radiation accidents resulting from an inadvertent, self- sustaining nuclear chain reaction of radioactive materials.

Core sampling is one component of the comprehensive tank integrity program. In recent years, EM and WRPS have developed and deployed innovative robotic systems for visual inspections of double-shell tank bottoms. Development is ongoing to deploy robotic systems for ultrasonic inspections of the tank bottom to detect thinning, pitting, and cracking.