

**OVERVIEW OF TANK WASTE REMEDIATION SYSTEM  
AT THE HANFORD SITE**

**FOR THE  
NUCLEAR WASTE TECHNICAL REVIEW BOARD  
MEETING OF THE PANEL ON THE ENGINEERING  
BARRIER SYSTEM**

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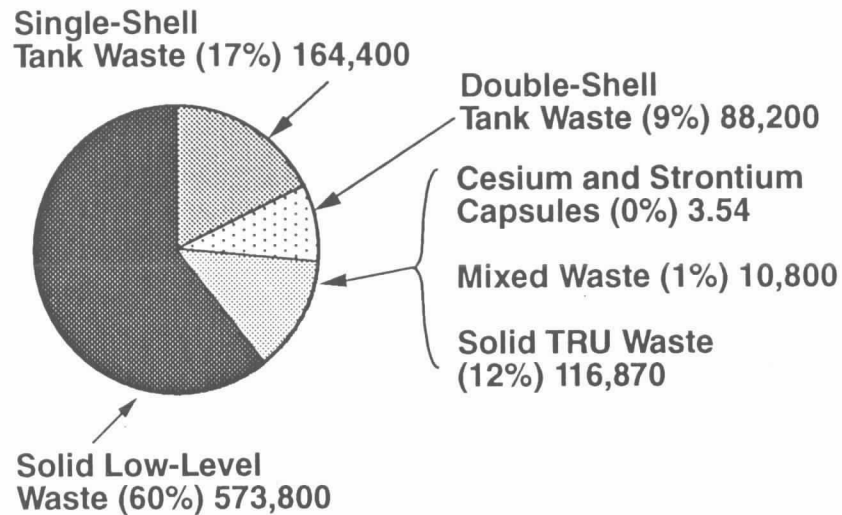
**MAY 11, 1992  
RICHLAND, WASHINGTON**

# Topics

- **Tank Storage of Radioactive Wastes at Hanford**
- **Tank Waste Remediation System (TWRS)**
  - **Overview**
  - **Evolution**
  - **Recommended Program**

# Hanford Site Waste

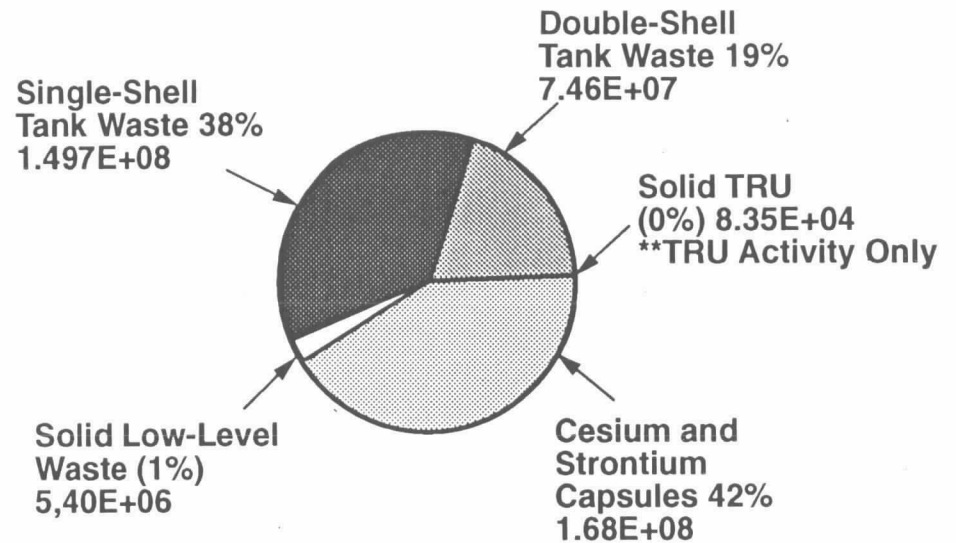
## Volume



Total Volume: \*954,073 m<sup>3</sup>

\*Does not include past practice units and surplus facilities information per 1991 Integrated Data Base submittal

## Radioactivity

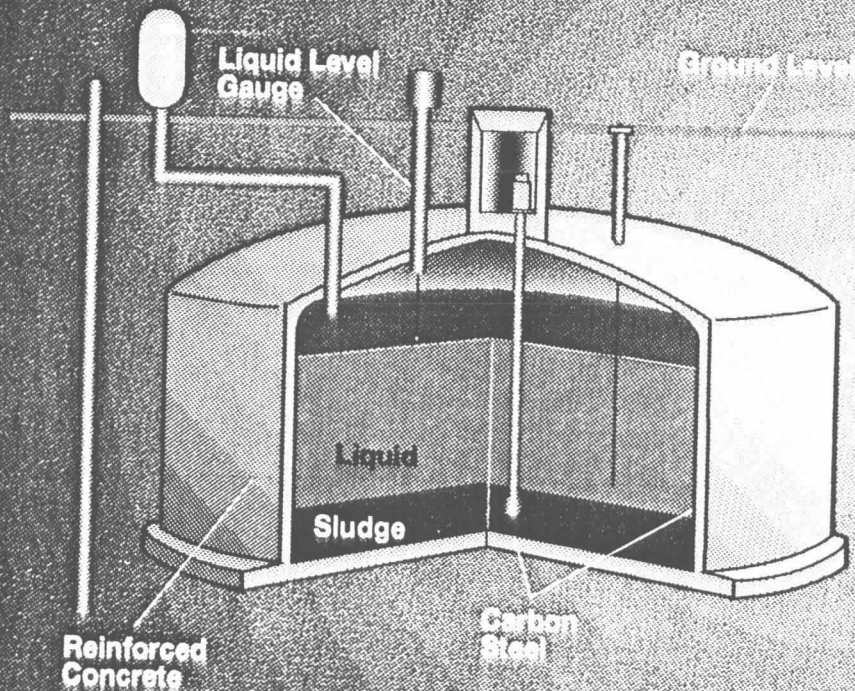


Total Radioactivity: \*3.98E+08 Ci

## Key Hazardous Materials

- Nitrates
- Nitrites
- Chromium
- Cobalt
- Heavy Metals
- Cyanide
- Carbon Tetrachloride
- Selenium
- Trichlorethylene

# Single-Shell Tanks



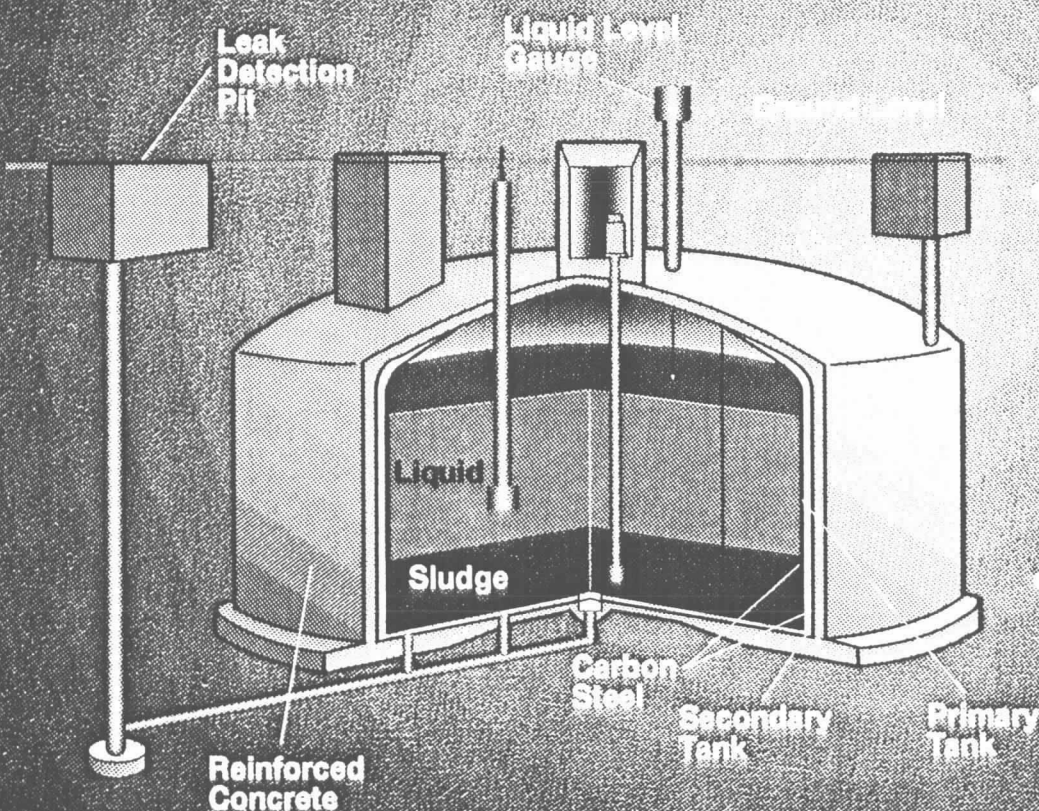
- 149 Tanks Constructed 1943-64
- 55,000 to 1 Million Gallon Capacity
- Bottom of Tanks at Least 150 Feet Above Groundwater
- No Waste Added to Tanks Since 1980
- Tanks Currently Contain
  - ~ 37 Million Gallons of Saltcake, Sludge, and Liquid
  - ~ 155 Million Curies
- 66 are assumed to have Leaked ~1 Million Gallons

# Single-Shell Tank Farms

- **12 Single-Shell Tank Farms**
  - **6 in 200 East Area**
  - **6 in 200 West Area**
- **149 Single-Shell Tanks (SST)**
  - **Built between 1943 and 1964**
  - **Removed from active service by November 1980**
- **SSTs store 38 million gallons of sludge, saltcake, and liquid waste**
- **66 SSTs are assumed leakers**



# Double-Shell Tanks



- 28 Tanks Constructed Between 1968-86
- 1 to 1.14 Million Gallon Capacity
- Tanks Currently Contain
  - ~ 24 Million Gallons of Mostly Liquids (Also Sludges and Salts)
  - ~ 110 Million Curies
- None Have Leaked

# Double-Shell Tank Farms

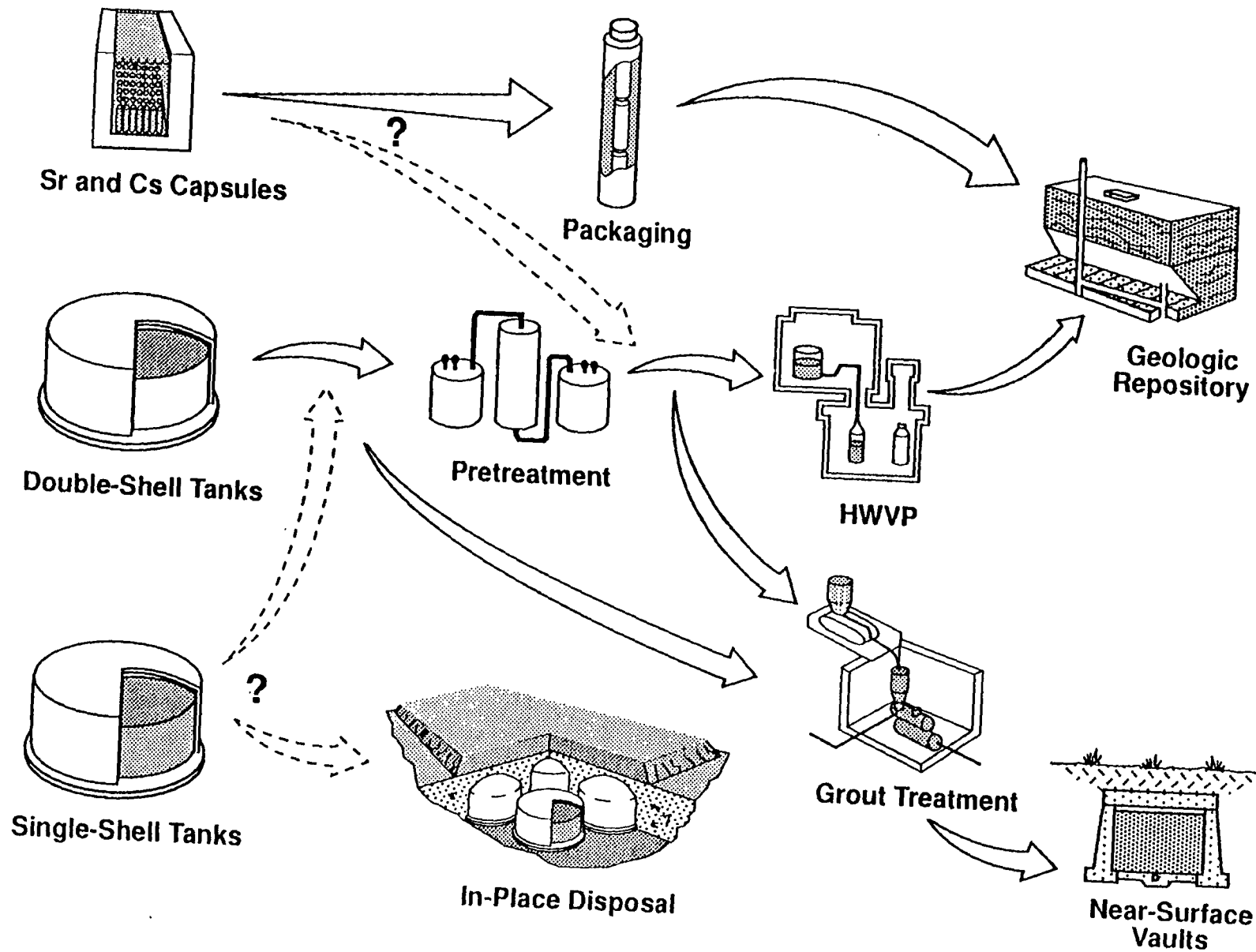
- **6 Double-shell tank farms**
  - **5 in 200 East Area**
  - **1 in 200 West Area**
- **28 Double-shell tanks (DSTs)**
  - **Built between 1968 and 1986**
  - **In use since 1970**
- **No DST has leaked**

# Overview

- **Tank Waste Remediation System (TWRS) was developed to safely dispose of all tank waste at Hanford**
- **Developed in concert with DOE, Washington Department of Ecology and others**
- **Encompasses the following aspects of tank waste remediation**
  - **Tank Safety**
  - **Characterization**
  - **Retrieval**
  - **Pretreatment**
  - **High Level Waste Disposal (HWVP)**
  - **Low Level Waste Disposal (Grout)**



# Hanford Waste Management Program



# TWRS Evolution

- **HDW-EIS ROD, 1988, defined basic program**
  - **Pretreatment of DST waste in B Plant**
  - **Terminal waste forms of grout and glass**
  - **DSS/DSSF to grout with no pretreatment**
  - **Additional study before dealing with SST wastes**
- **At time of ROD, it was felt that B Plant could be operated with the intent of DOE Orders and WAC hazardous materials**
- **Noordhoff study of 1989 reconfirmed earlier decision to use B Plant as pretreatment facility**

## **TWRS Evolution (cont)**

- **Concern over changing regulatory climate and technical uncertainties led to performance of the HWVP Risk Assessment (FY 1991)**
  - **Identified B Plant compliance problems as most significant risk to HWVP success**
  - **Lack of feed continuity of HWVP also identified as a significant risk**
- **Program Redefinition Study performed to develop best disposal strategy for DST wastes**
- **Redefinition Study expanded to include SST waste and emerging tank safety issues**

## **TWRS Evolution (cont)**

- **Interaction among involved parties (WHC/PNL, DOE-RL & DOE-HQ) further developed the WHC/PNL strategy into the current TWRS program**
- **TWRS Decision Statement Issued by Secretary, December 20, 1991**
  - **Decision Plan - Updated every 6 weeks**
  - **Program Plan - September 1992**
  - **Program Management Plan - March 1993**

# Recommended Program

- **Tank safety is first consideration (Tanks 101-SY, 106C)**
- **Restart Evaporator**
- **New Tank Farm 1996**
- **14 Grout Campaigns**
- **Initial Pretreatment Module Operational 1997**
- **Existing Facility Management**
- **HWVP Hot Startup 1999**