

**U. S. DEPARTMENT OF ENERGY  
RICHLAND FIELD OFFICE**

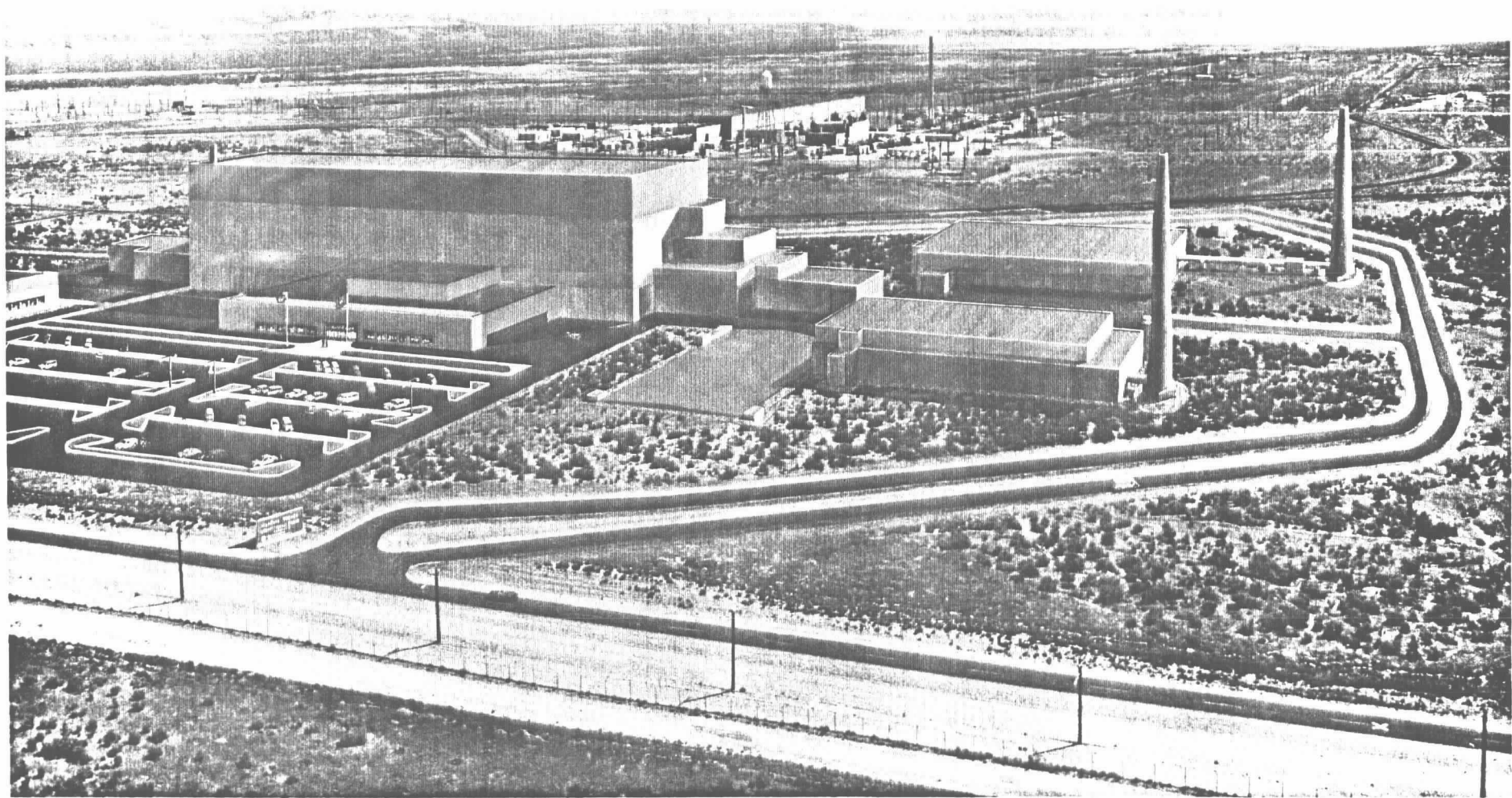
**Overview of the Planned  
Hanford Waste Vitrification Plant Project**

**Presented To:**

**NUCLEAR WASTE TECHNICAL REVIEW BOARD  
PANEL ON THE ENGINEERED BARRIER SYSTEM**

**Robert W. Brown, Director  
Treatment Projects Division**

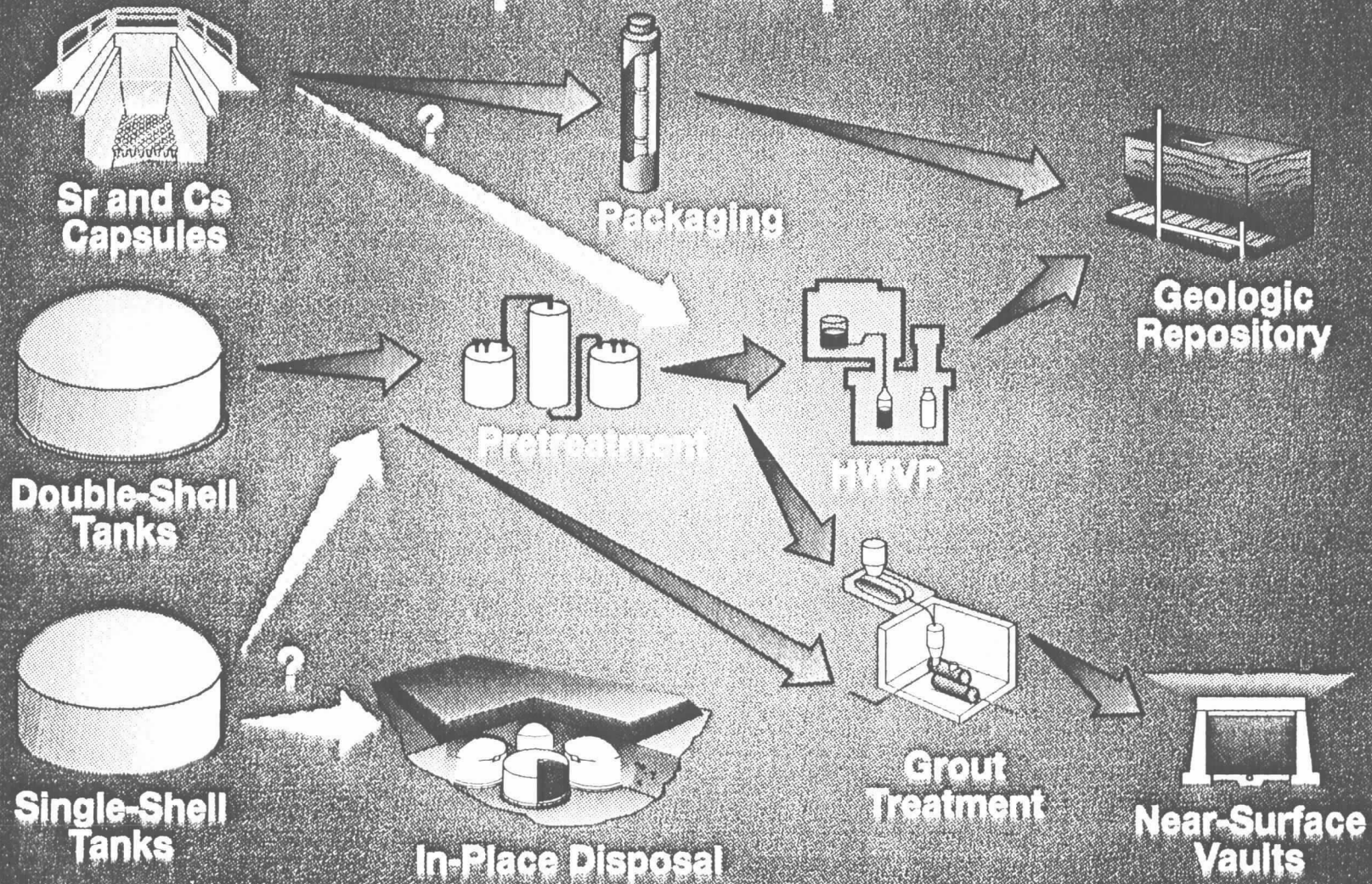
**May 11, 1992**



## **Mission**

**Incorporate pretreated high-level and transuranic wastes into a borosilicate glass contained in sealed canisters for disposal in a geologic repository**

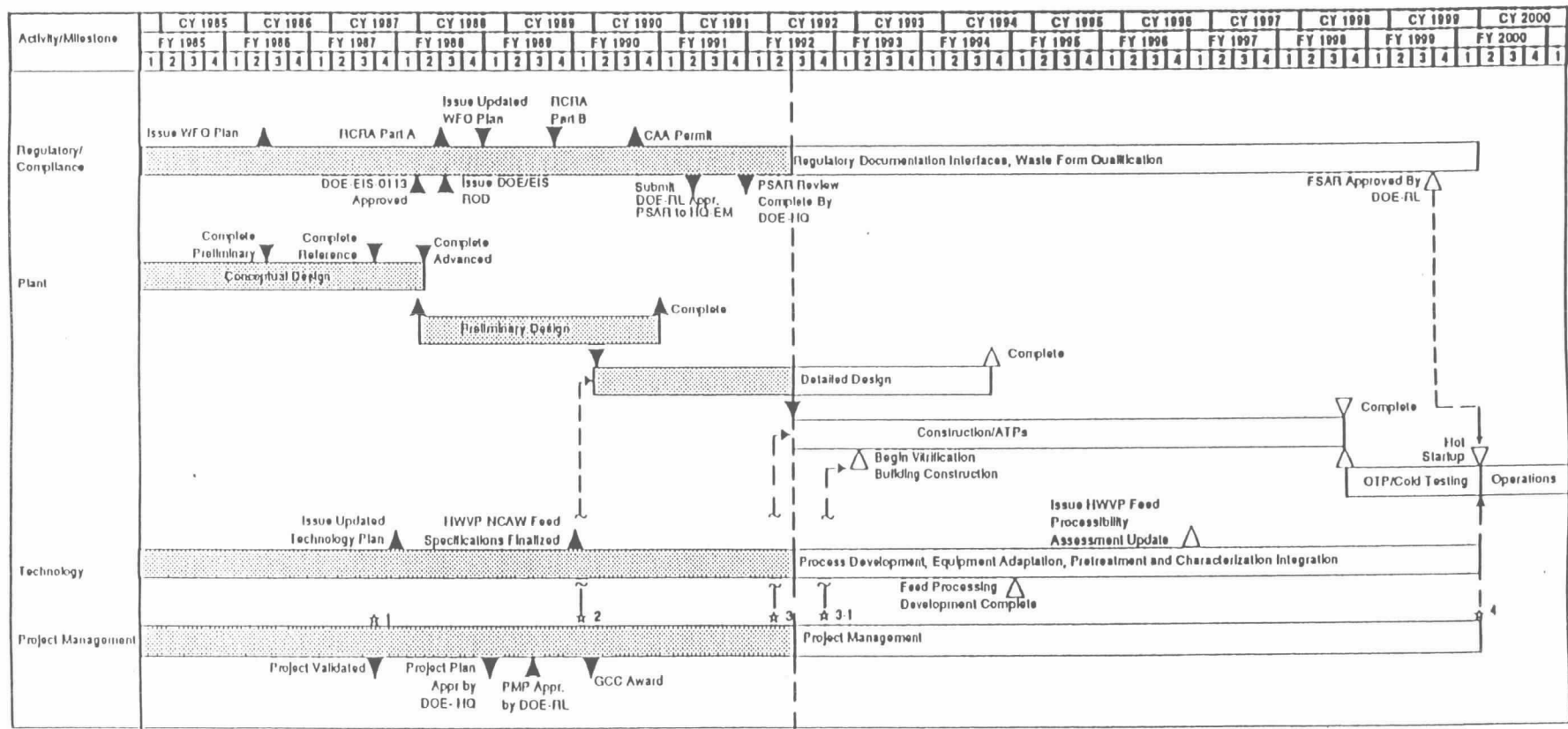
# Hanford Site Radioactive Waste Tanks and Capsule Disposal Plan



# Hanford Waste Vitrification Plant Project

## HWVP Project Summary Schedule

### Hanford Waste Vitrification Plant Project Summary Schedule



LEGEND: ☆ Key Decisions Δ DOE-IL Controlled Milestone ▽ DOE-HQ Controlled Milestone

ACRONYMS: ATP - Acceptance Test Procedure  
 CAA - Clean Air Act  
 CC - Concentrant Concentrate  
 EIS - Environmental Impact Statement  
 FSAI - Final Safety Analysis Report  
 NCAW - Neutralized Current Acid Waste  
 OTP - Operations Test Procedure  
 PFP - Plutonium Finishing Plant  
 PSAR - Preliminary Safety Analysis Report  
 RCRA - Resource Conservation & Recovery Act  
 ROD - Record of Decision  
 WFO - Waste Form Qualification

☆ Key Decision  
 1. Approval of New Start  
 2. Approval to Commence Detailed Design  
 3. Approval to Commence Site Preparation  
 3-1. Approval to Commence Construction  
 4. Approval to Commence Operation

HWVP-0491

## Status of HWVP

- Completed preliminary design
- 37% detailed design
- Received Interim Status Expansion from Washington State Department of Ecology
- Site preparation construction started in April 1992
- Preliminary Safety Analysis Report completed and the Safety Evaluation Report issued

## Tri-Party Agreement Milestone Status

<u>Milestone Number</u>	<u>Milestone Title</u>	<u>Baseline Date</u>	<u>Actual/forecast Date</u>
M-03-00	Initiate HWVP operations	12/99	12/99
M-03-01	Initiate HWVP construction	04/92	04/92A
M-03-01-T01	Establish date for HWVP design completion	01/92	01/92A
M-03-01-T02	Initiate design of HWVP Canister Storage Building	12/91	07/91A
M-03-01-T1	Detailed vitrification plant design/construction schedule available	03/90	01/90A
M-03-01-T2	Issue preliminary design technical description report HWVP	11/90	09/90A

## Tri-Party Agreement Milestone Status

<u>Milestone Number</u>	<u>Milestone Title</u>	<u>Baseline Date</u>	<u>Actual/forecast Date</u>
M-03-02	Complete HWVP Construction	06/98	06/98
M-03-03	Complete Vitrification Building and HWVP Detailed Design	06/94	06/94
M-03-04	Initiate construction of the CSB or Multi-Purpose Storage Complex	02/93	02/93
M-03-05	Initiate construction of the Vitrification Building Foundation	03/93	03/93
M-03-06	Initiate installation of Vitrification Building mechanical equipment and piping	08/94	08/94



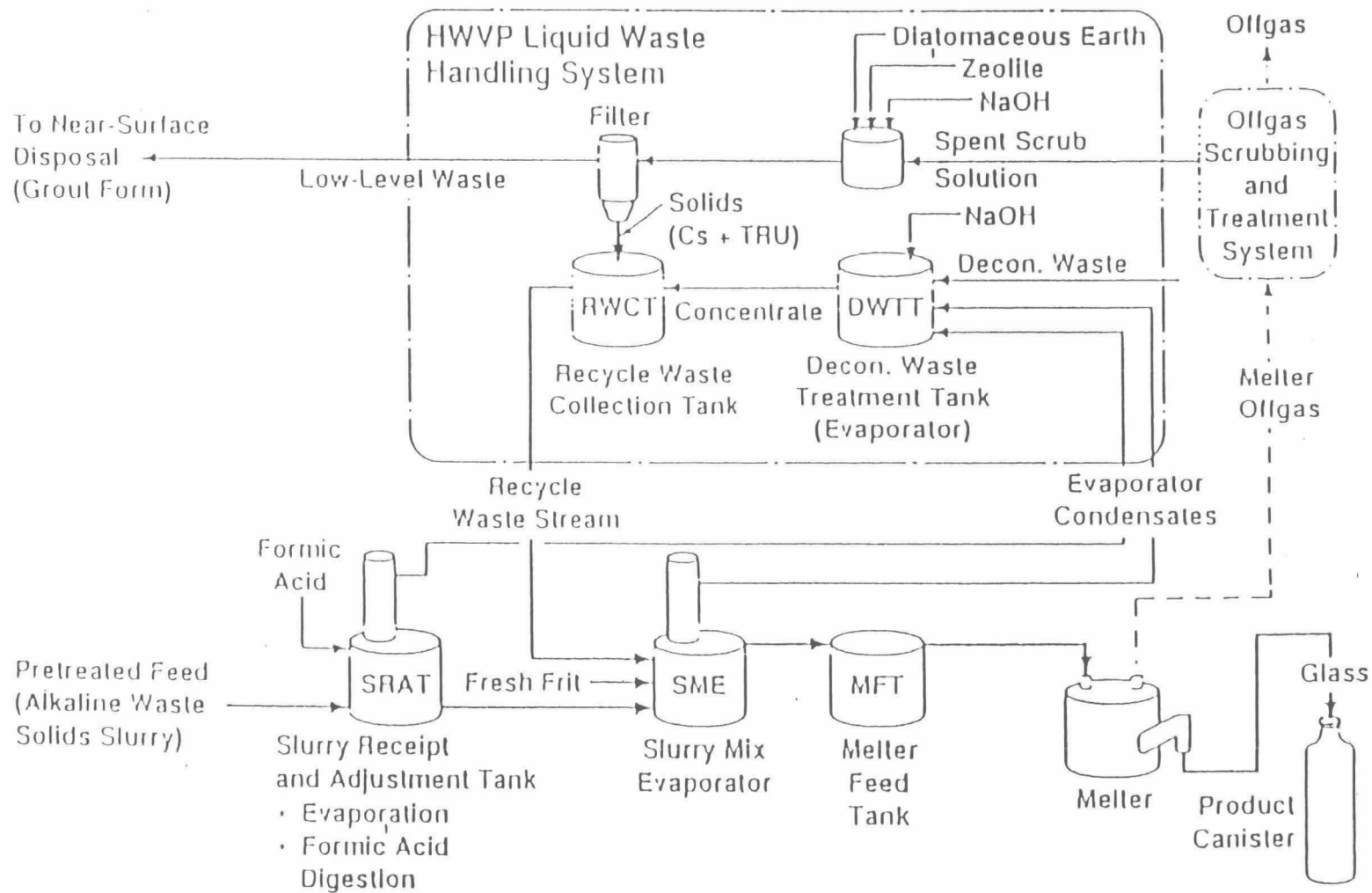
# Tri-Party Agreement Milestone Status

<u>Milestone Number</u>	<u>Milestone Title</u>	<u>Baseline Date</u>	<u>Actual/forecast Date</u>
M-03-07	Initiate installation of Vitrification Building electrical and instrumentation	11/94	11/94
M-20-01	Submit HWVP RCRA Part B permit application to Ecology and EPA	06/98	06/98

## HWVP Process Requirements

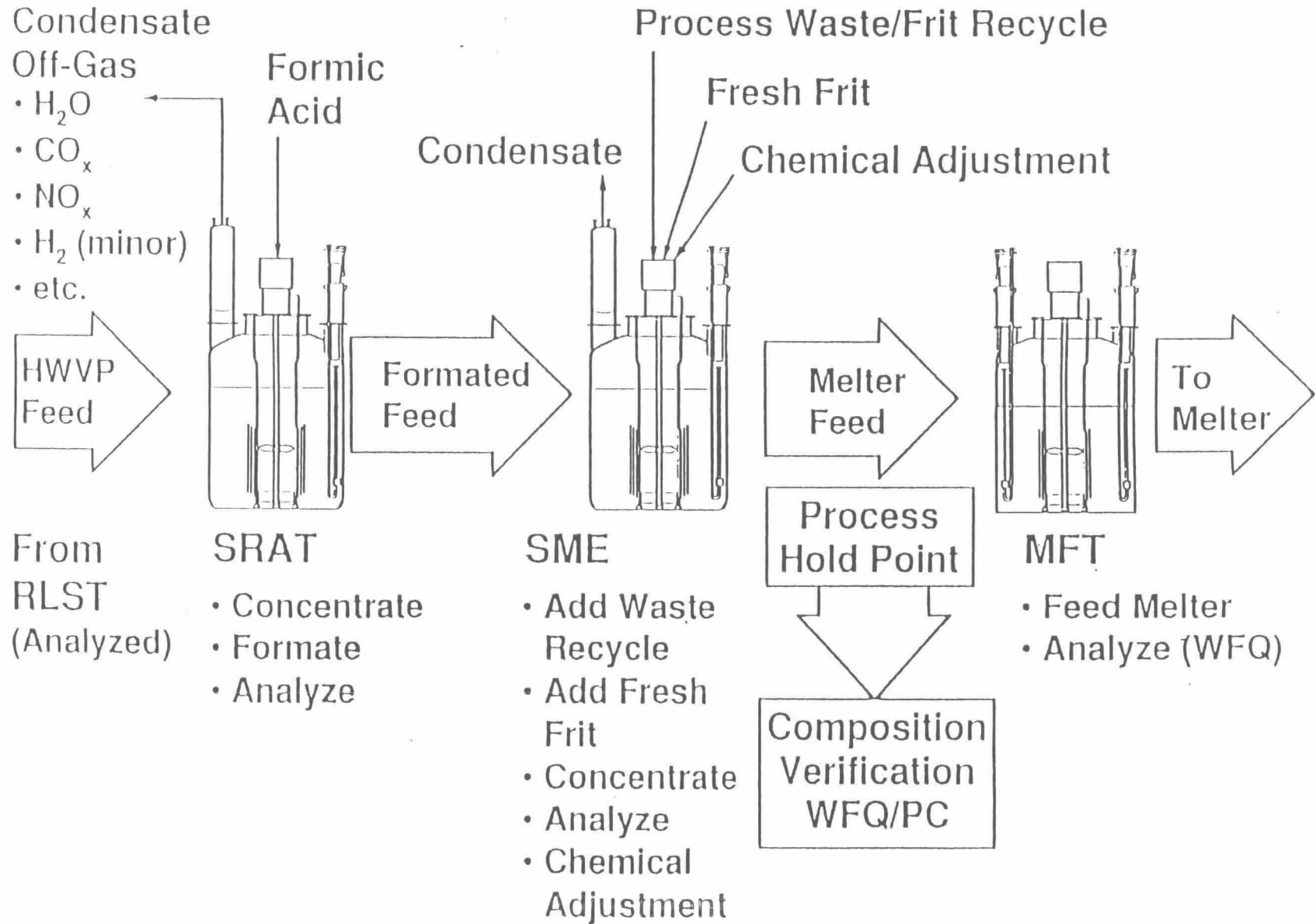
- Receive pretreated high-level and transuranic waste slurries
- Incorporate radioactive waste components into a vitrified borosilicate glass
- Seal vitrified waste in canisters for shipment to repository
- Provide storage for filled canisters until shipment
- Capacity for 100 Kg/h glass production

## Simplified HWVP Process Flow Diagram

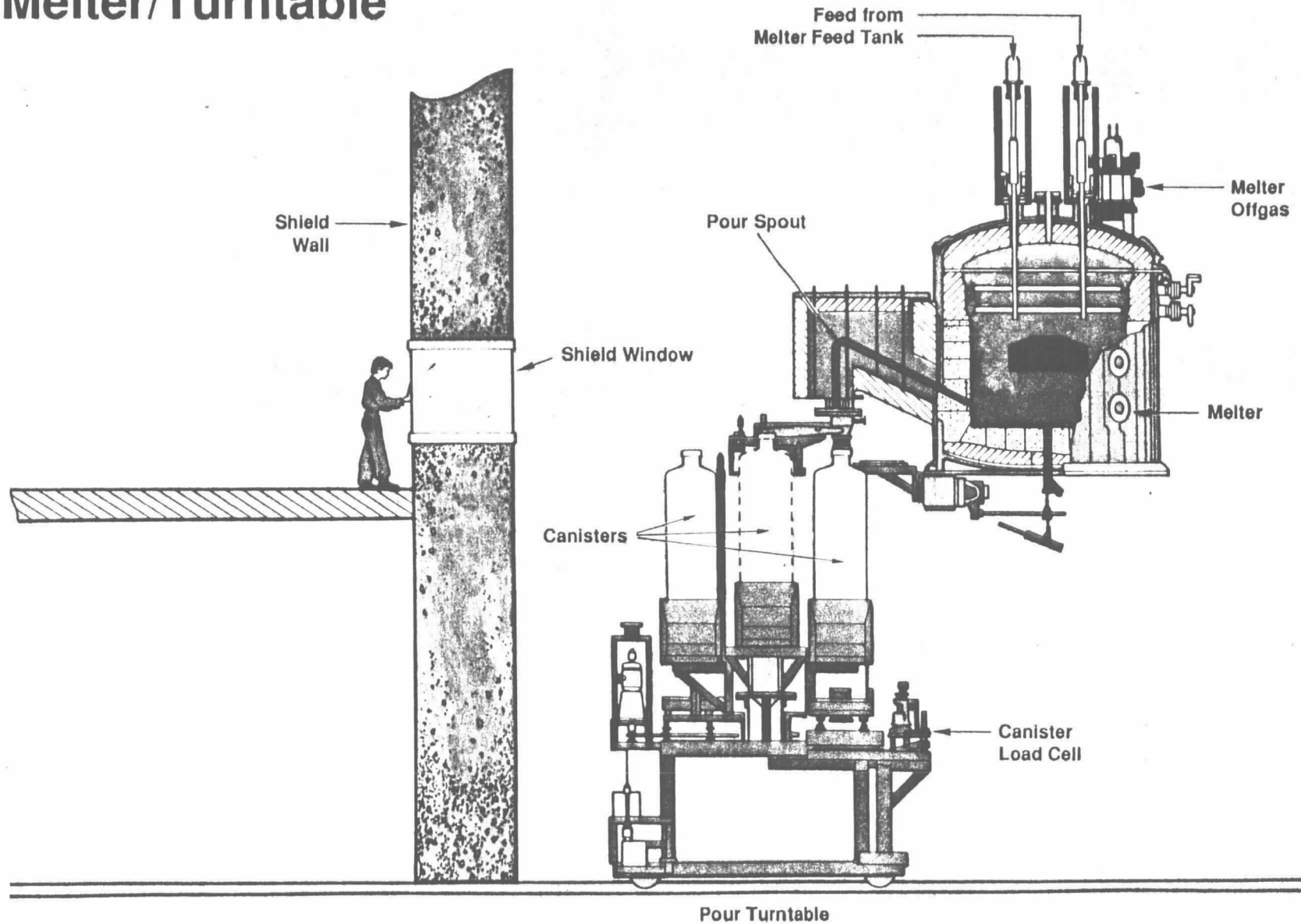


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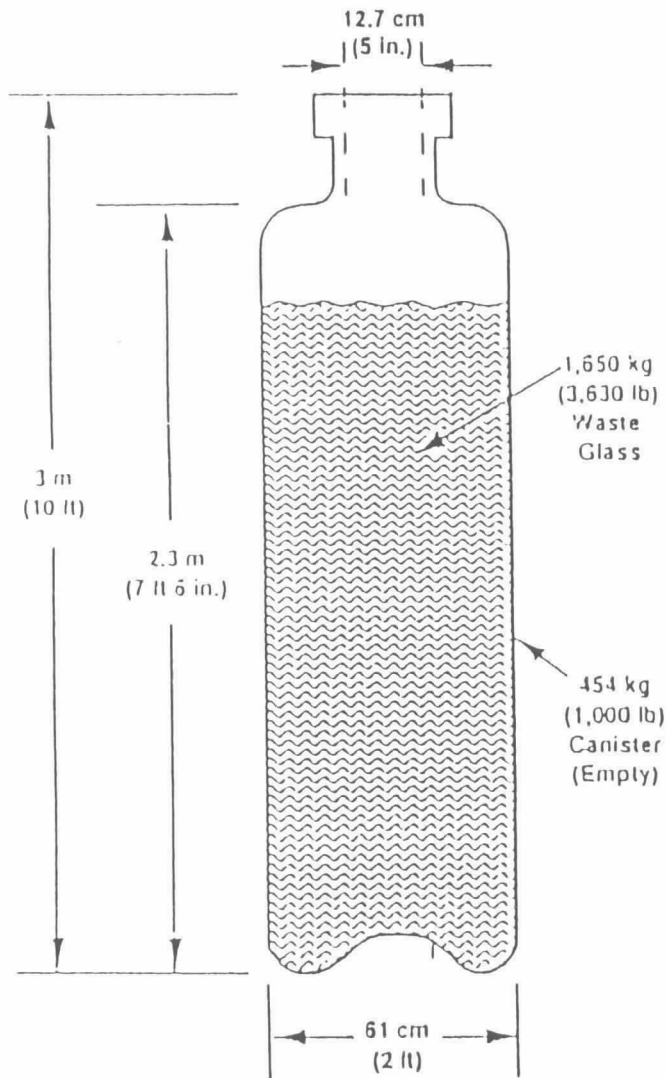
# Feed Preparation Process Description



# Hanford Waste Vitrification Plant Melter/Turntable



# HWVP Canister



## Canister

Material:	Type 304L stainless steel (Schedule 20 pipe)
Surface Area:	6.5 m <sup>2</sup> (70 ft <sup>2</sup> )
Heat Load:	750 to 1400 W
Surface Temperature:	82 °C (-179 °F)
Lid Temperature:	57 °C (-135 °F)
Glass Density:	2.64 g/cm <sup>3</sup> (164.8 lb/ft <sup>3</sup> )
Glass Volume:	625 L (22 ft <sup>3</sup> )
Waste Loading:	25% oxide
Activity:	-4 x 10 <sup>5</sup> Ci
Exposure Rate:	-2 x 10 <sup>-4</sup> rad/h

## Summary

- **HWVP is proceeding on baseline schedule for 1999 hot start**
- **Major plant systems and features incorporate DWPF lessons learned**
- **Test programs support design and process verification**
- **Processing implications of TWR expanded waste tank feed sources will be assessed**