



West Valley Demonstration Project

Project Overview

October 25, 2006

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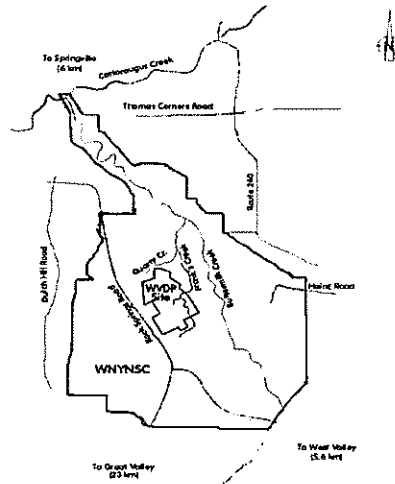


Western New York Nuclear Service

- 3,345 acre site owned by the New York State Energy Research and Development Authority

West Valley Demonstration Project

- approximately 200 acres of the WNYNSC are controlled by the Department of Energy to conduct the WVDP



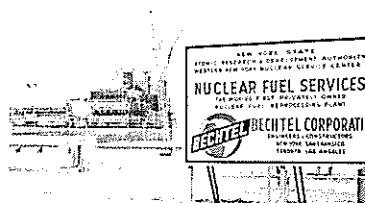
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WVDP Background

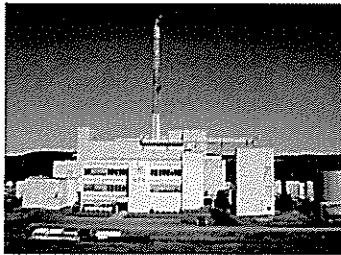
1962 Nuclear Fuel Services reached an agreement with the Atomic Energy Commission and New York State to construct the first commercial nuclear fuel reprocessing plant in the United States

1962 - 1966 — Reprocessing Plant Constructed



1966 - 1972 Spent nuclear fuel was reprocessed; majority supplied by federal government —600,000 gallons of liquid high-level waste resulted

1972 - 1976 The reprocessing plant was shut down for modifications; operations were never resumed

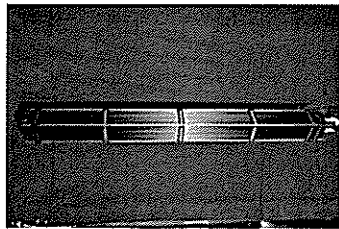


1982—Reprocessing Plant

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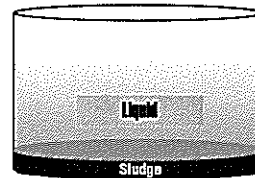


Reprocessing

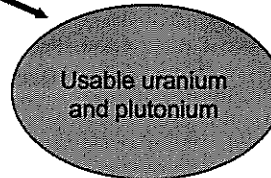


Nuclear fuel assemblies typically 7 feet to 14 feet long

Chop and Dissolve in Acid



Liquid High-level Waste



Usable uranium and plutonium

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High-level Waste (HLW) Tank

HLW Tank Cross Section

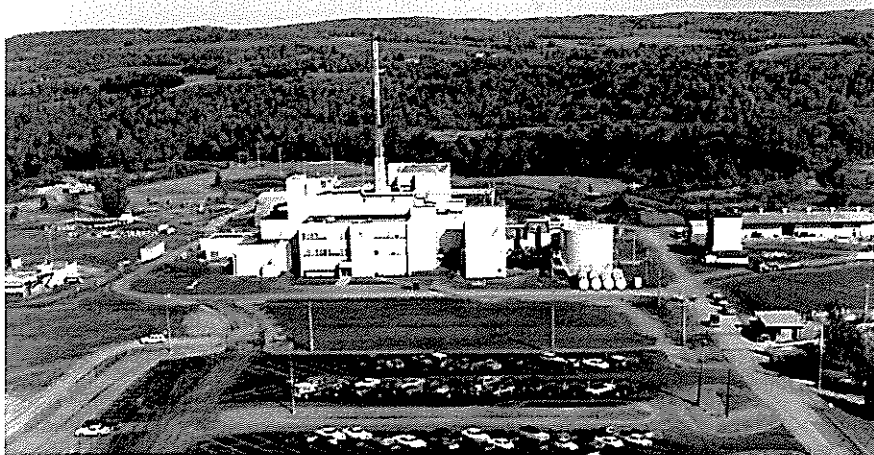


Circular tank about 70' in diameter, 27' high

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West Valley Demonstration Project



WVDP site in 1982

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WVDP Background — The Act

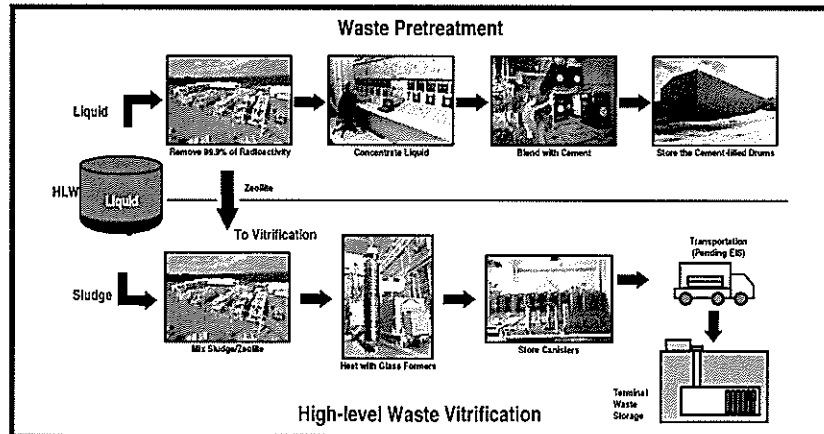
- ◆ October 1, 1980
 - Public Law 96-368 signed into law by President Carter in Niagara Falls, NY
 - Act authorizes the U.S. Department of Energy to conduct a high-level radioactive waste management demonstration project at the Western New York Nuclear Service Center (the Center)
 - DOE is directed to:
 - Solidify the high-level radioactive waste at the Center
 - Develop containers suitable for permanent disposal of the waste
 - Transport the solidified waste to a federal repository for permanent disposal
 - Dispose of low-level radioactive waste and transuranic waste
 - Decontaminate and decommission the HLW tanks, facilities, and any material and hardware used in connection with the Project
 - Required NYSERDA to make facilities and waste available to DOE
 - Technical specifications of NYSERDA's NRC License in Abeyance while DOE has operational control of the 164 acre "Project Premises"
 - Act specifies 90/10 (DOE/NYSERDA) cost share arrangement
 - NRC required by WVDP Act to establish Decommissioning Criteria (NRC Prescribed License Termination Rule Criteria in 2/02 Policy Statement)

18890_7



High-Level Waste (HLW) Vitrification Began with Process Design

To solidify the radioactive material from approximately 600,000 gallons of high-level radioactive waste into a durable, high-quality glass, both a pretreatment system to remove salts and sulfates from the waste and a vitrification system/process were designed.

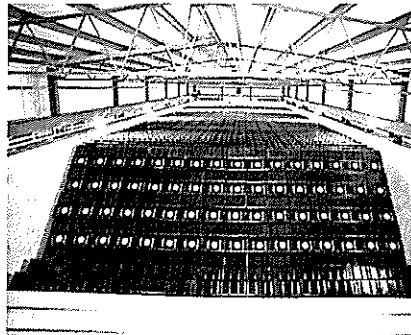


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Pretreatment/Sludge Washing Operations

- ◆ Four-part Integrated Radwaste Treatment System
 - Separated out salts and sulfates
 - Blended in cement
 - Placed drums of cemented waste in storage
- ◆ 1988-1990 - removal of salts from liquid portion of waste in underground waste tank (8D-2)
- ◆ 1991 - 1995 - sludge washing operations to remove salts and sulfates
- ◆ Total operations processed 1.7 million gallons of low-level salt solution into 19,877 drums of cemented LLW currently stored in the Drum Cell



71-gallon drums of cemented waste in storage at the WYDP.

16890_9



Curies – Radionuclide – Half Life 1,000 curies

	Cobalt-60 (~5 yr.)	Cesium-137/ Strontium-90 (~30 yr.)	Americum-241 (~433 yr.)	Technicium-99 (~211,000 yr.)
Day 0	1,000	1,000	1,000	1,000
30 years	15	500	930	1,000
60 years	0.23	250	861	1,000

1 curie = 3.7×10^{10} disintegrations per minute

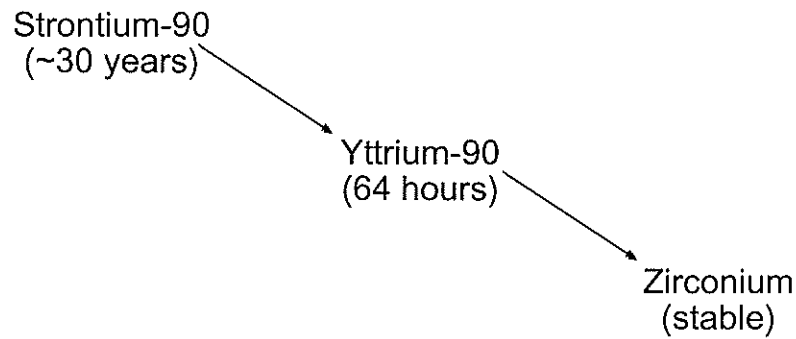
Note: Radionuclides don't all give off same type(s) of radiation

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Radioactive Decay

Example

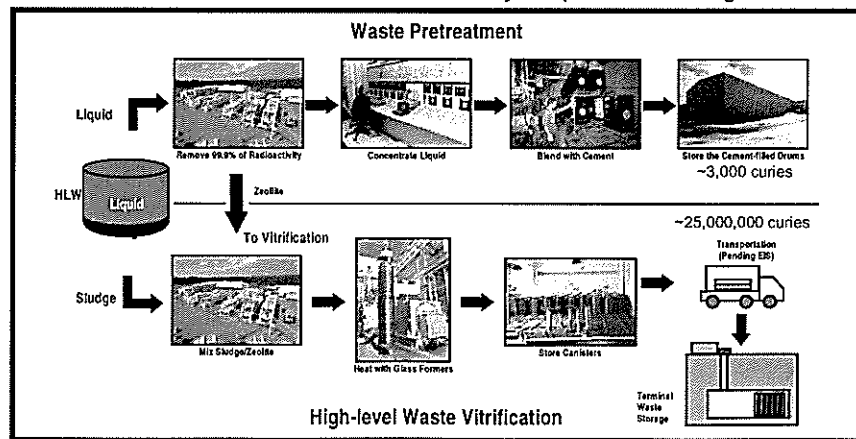


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High-Level Waste (HLW) Vitrification Began with Process Design

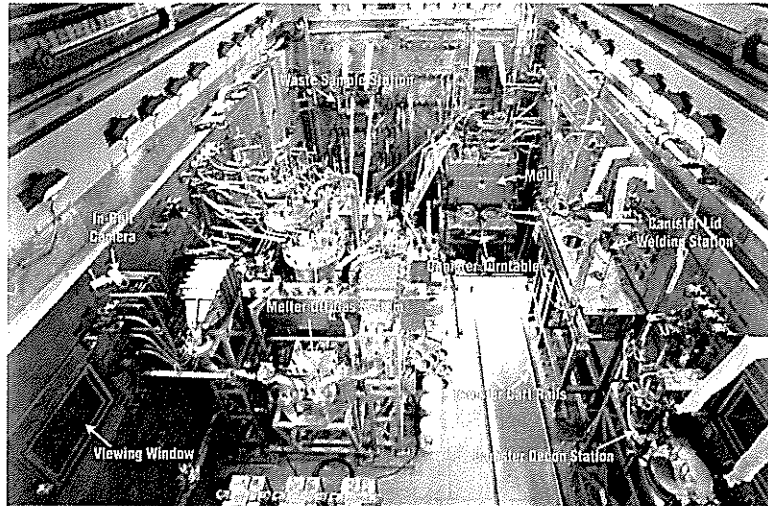
To solidify the radioactive material from approximately 600,000 gallons of high-level radioactive waste into a durable, high-quality glass, both a pretreatment system to remove salts and sulfates from the waste and a vitrification system/process were designed.



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Vitrification Cell



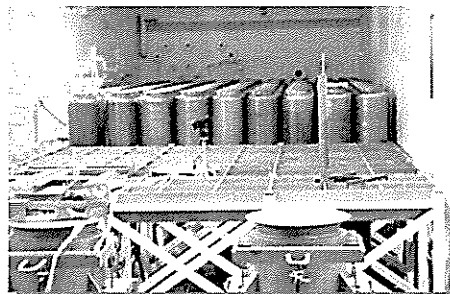
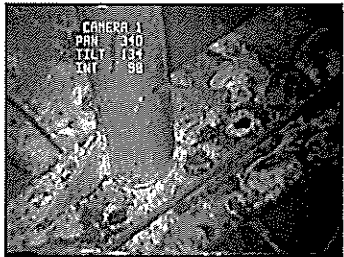
View in 1996
before start of
processing

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High-level Waste Processing

- ◆ Vitrification began in 1996;
85% of the HLW processed by
May 1998
- ◆ Efforts from 1998 through
2002 focused on residual heel
removal and washing/flushing
of the tank to remove as much
waste as practical



A total of 275 canisters of waste glass were produced
and are in storage.

- ◆ HLW processing system safely
shutdown in 2002
- ◆ 275 HLW canisters stored on site

Photo showing bottom of the HLW tank.

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High-level Waste Processing

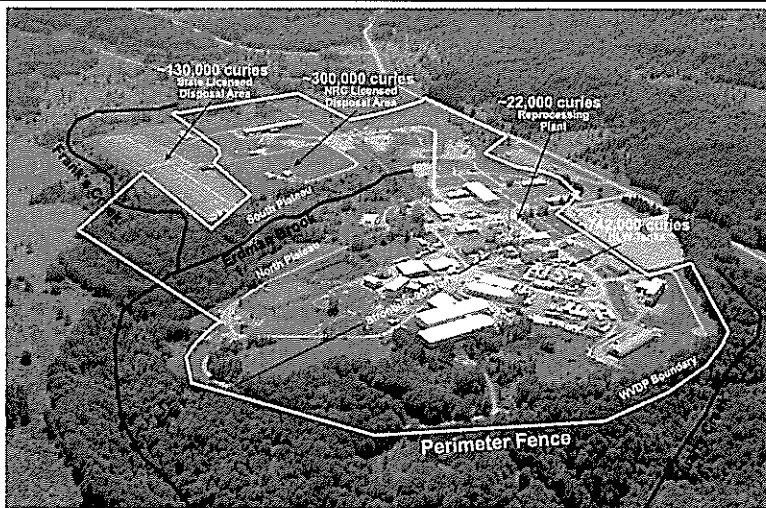
- ◆ Vitrification program a significant technological and environmental success
 - Liquid waste threat eliminated
 - Vitrification system operated better than predicted
 - 78% availability the first year
 - No failures of major components

Vitrification Campaign Statistics	
<p>Pretreatment</p> <ul style="list-style-type: none"> • 1.7 million gallons processed • 19,877 drums of cemented low-level waste produced 	<p>Vitrification</p> <ul style="list-style-type: none"> • More than 1.3 million pounds of waste glass produced • More than 24 million curies processed • Approximately 35% waste loading in glass • Canister dose rates range from ~2000 - 7000 R/hr on contact

18890_15



Major Site Facilities Today



*Estimated Total Curies at the West Valley Demonstration Project
October 25, 2006*

18890_16



2002 – 2006 Work Focused on Completing WVDP Act Mandates

- ◆ **Dispose of Project generated low-level waste and Transuranic waste**
- ◆ **Decontaminate and decommission the tanks, facilities, and any material and hardware used in connection with the Project**
- ◆ **Transport HLW canisters to Federal Repository**
 - working
 - on hold

18890_17



WVDP National Environmental Policy Act Background

- | | |
|--------|---|
| 1982 | Environmental Impact Statement (EIS) and Record of Decision for HLW processing |
| 1986 | Environmental Assessment for on-site low-level waste disposal <ul style="list-style-type: none">— litigated— evaluation deferred to closure EIS |
| 1988 – | National effort to develop regional LLW sites |
| 1992 | (Intent was to dispose of all LLW on site; dispose of transuranic and HLW off site) |
| 1996 | Draft EIS for WVDP completion and long-term site management released for public review; for LLW considered on-site storage and disposal, and off-site disposal |
| 1997 | WVDP began disposition of LLW off site |
| 2001 | Rescoped EIS <ul style="list-style-type: none">— new EIS for off-site shipment of WVDP wastes for disposal— focused completion/closure EIS on facilities posing greatest long-term environmental risk; disposal areas, reprocessing plant, underground tanks |

18890_18



WVDP National Environmental Policy Act Background

- 2003 Notice of Intent to prepare Decommissioning and/or Long-Term Stewardship at the WVDP and Western New York Nuclear Service Center
Notice of Availability of the WVDP Draft Waste Management EIS
- 2004 Notice of Availability of the WVDP Final Waste Management EIS
- 2005 Record of Decision following WVDP Final Waste Management EIS

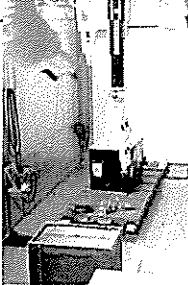
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Work Accomplished Between 2002 - 2006

- ◆ Completed construction and operated Remote-Handled Waste Facility
- ◆ Shipped remaining used nuclear fuel to DOE's Idaho facility for storage
- ◆ Shipped over 800,000 cubic feet of low-level waste for disposal
- ◆ Remotely dismantled, and removed and packaged vitrification processing equipment
- ◆ Drained and shut down the used fuel storage pool
- ◆ Removed and packaged contaminated hardware from highly radioactive chambers in the reprocessing plant
- ◆ Removed and demolished unneeded, excess facilities
- ◆ Dispositioned equipment in open storage areas (hardstands)

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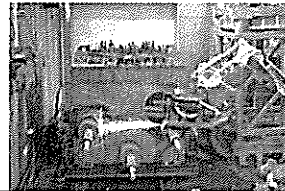
Remote-Handled Waste Facility



Spent Fuel Shipment



LLW Shipment

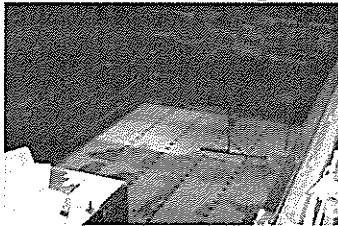


Vitrification Facility Decontamination

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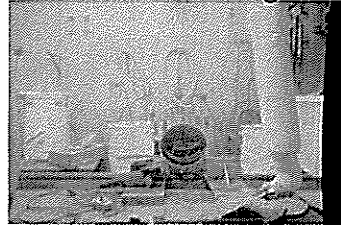


Drained Fuel Storage Pool

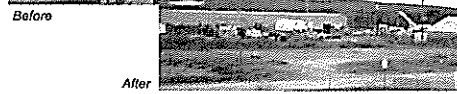


Removed Excess Facilities

Drained Fuel Storage Pool



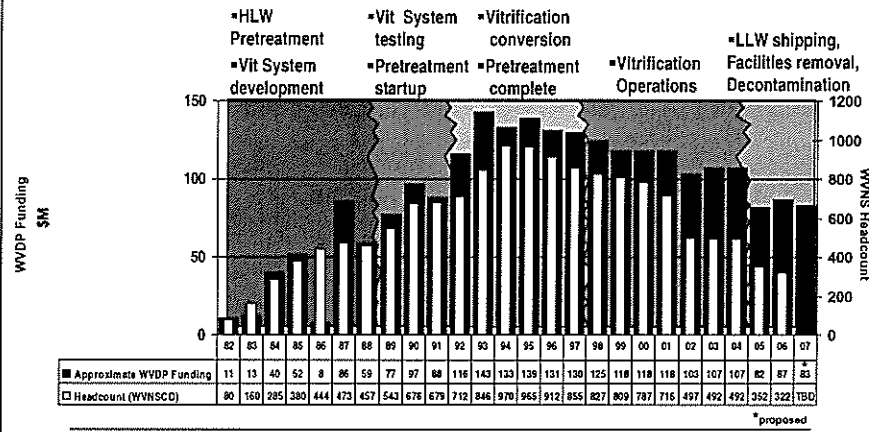
Dispositioned Equipment on Hardstands



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Funding and Headcount



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WVDP 2007 - 2010

- ◆ DOE issued Request for Proposals for new primary contractor to begin January 1, 2007
- ◆ A WVDP Interim End State to be achieved by 2010
 - Description in DOE WVDP Site Utilization Management Plan August 2005

18890_24



Interim End State Completion - 2010



18890_25