# U.S. Nuclear Regulatory Commission Decommissioning Process for the U.S. Department of Energy under the West Valley Demonstration Project Act

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March 23, 2004

# NRC Decommissioning Process for DOE under WVDP Act

- NRC prescribes decommissioning criteria
- DOE submits decommissioning plan (DP)
- NRC performs acceptance review
  - if information not sufficient, inform DOE
  - if information sufficient, publish Federal Register Notice (FRN) to:

    (1) acknowledge receipt of DP for review

    (2) request public comment on DP

# Decommissioning Plan Review

- NRC performs detailed review of DP
  - approve as submitted, or
  - identify requests for additional information (RAIs), consider DOE responses, and determine if RAIs resolved

- NRC completes safety and environmental review

# Steps After NRC Approval of DP

- DOE conducts remediation per approved DP
- NRC conducts in-process monitoring inspections
- DOE submits Final Status Survey Report (FSSR) to show Derived Concentration Guideline Levels met
- NRC reviews FSSR and conducts confirmatory survey, if needed
- NRC reinstates NYSERDA license
- NYSERDA follows decommissioning process/license termination under the Atomic Energy Act

# Opportunities for Public Participation

- During development of the DP
- Upon NRC receipt of the DP
- During public NRC meetings regarding the DP
- Upon publication of the Draft Decommissioning Environmental Impact Statement
- During NYSERDA's decommissioning process

# WVDP Decommissioning
# Regulatory Framework

The West Valley Demonstration Project Decommissioning Plan

## Regulatory Framework

A Briefing for the U.S. Nuclear Regulatory Commission

Dan Westcott

March 23, 2004

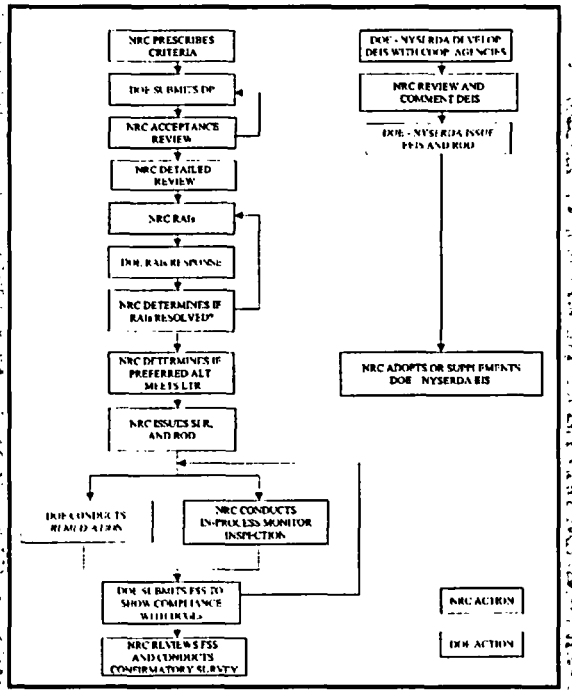
## Overview

- Decommissioning Plan (DP) Starting Point
  - Coordination with Decommissioning EIS
- Regulatory Framework for WVDP Decommissioning
  - WVDP Act
  - DOE/NRC MOU
  - NRC Implementation Plan
- Scoping the WVDP DP
  - Applicability of NUREG-1757 guidance
  - Approach for developing the WVDP DP

# WVDP Decommissioning
# Regulatory Framework

## NRC Request for DOE DP

- NRC letter from Larry Camper to Alice Williams dated February 3, 2003
  - "I am writing to request that DOE submit a Decommissioning Plan (DP) to the NRC."
  - "The DP will provide the basis for NRC's determination of whether the preferred alternative will meet the decommissioning criteria in accordance with the WVDP Act."
  - "NRC requests that the DP be submitted at approximately the same time as the Draft EIS for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center. This will allow parallel review of the information in the EIS and DP."




## Decommissioning Process for WVDP Under WVDP Act

# WVDP Decommissioning
# Regulatory Framework

## DP Starting Point

- Development of the WVDP DP will proceed in parallel with the development of the West Valley Decommissioning EIS
- The proposed action analyzed in the WVDP DP is envisioned to be DOE's preferred alternative in the Decommissioning EIS
- The starting point for the proposed action in the DP is the same as the starting point for the alternatives in the EIS
- There are many waste management actions and facility deactivation/removal activities identified in the draft DOE SOW that are envisioned to obtain NEPA coverage in a manner other than through the Decommissioning EIS
- These activities will not be addressed in either the Decommissioning EIS or the DP

## Waste Management Activities

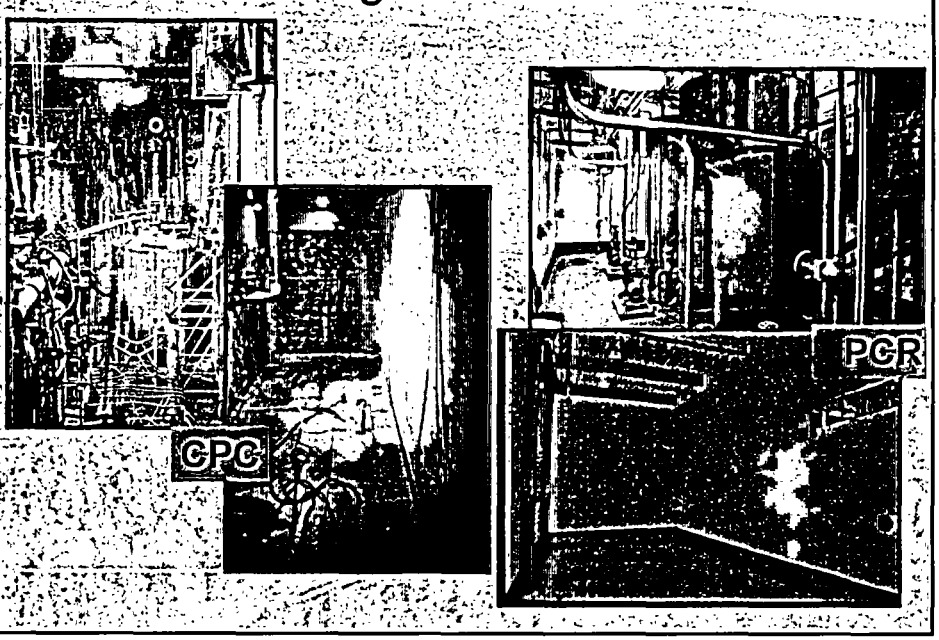
- DOE issued the WVDP Waste Management FEIS in January 2004
  - The preferred alternative involves shipping offsite for disposal all LLW and TRU waste in storage as well as waste that will be generated during ongoing facility deactivation
- All of these waste management activities are outside the scope of the Decommissioning EIS and are assumed to occur prior to decommissioning

## Facility Deactivation

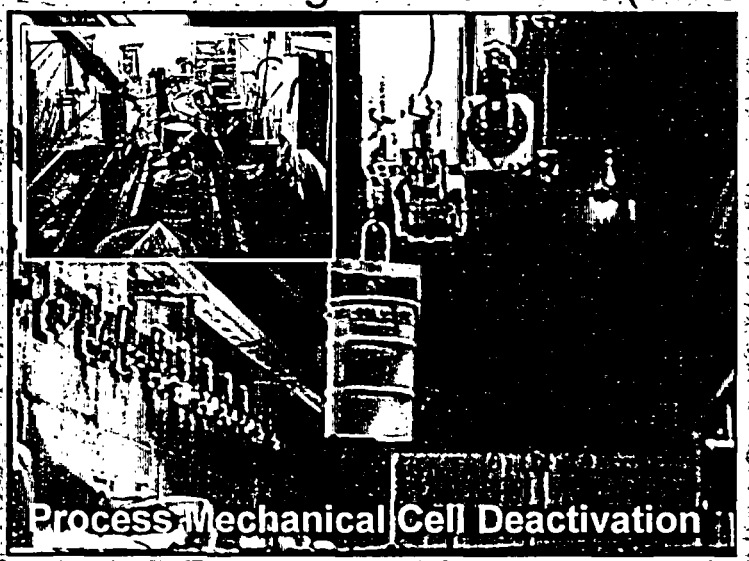
- The Process Building and the Vitrification Facility are currently being deactivated by removing excess radioactive piping and equipment
- The waste generated from "gutting" facility cells/rooms will be shipped offsite for disposal as part of the Waste Management EIS ROD
- All of these facility deactivation activities are outside the scope of the Decommissioning EIS and are assumed to occur prior to decommissioning



## Process Building Deactivation



## Process Building Deactivation (cont'd)

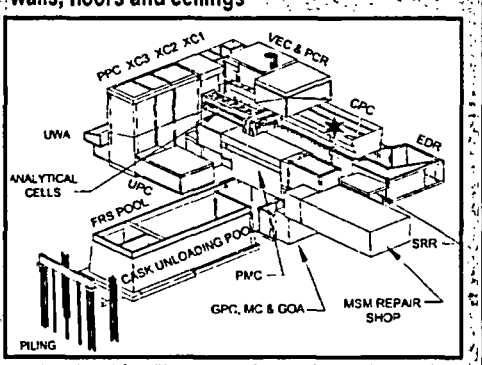




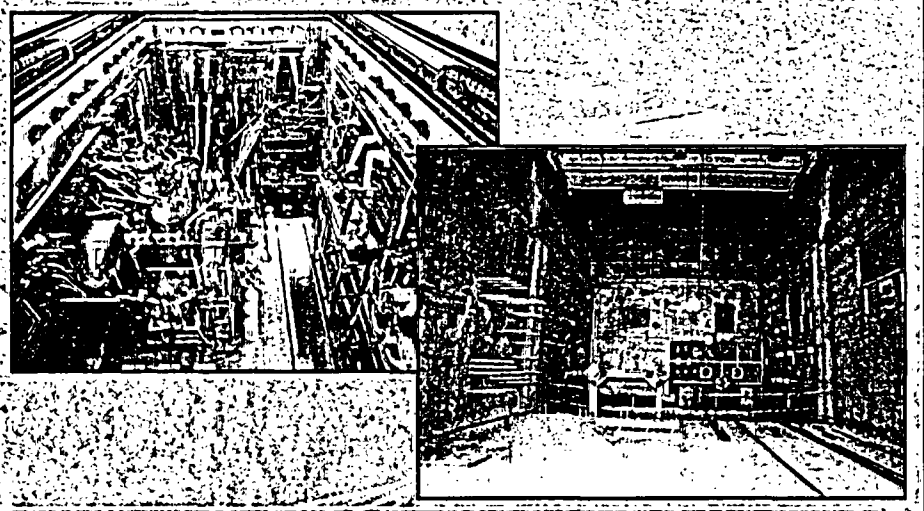

## Process Building Deactivation (cont'd)

- All areas of Process Building to be gutted except for:
  - Chemical Process Cell
  - CPC Crane Room
  - Systems and services required for contamination control and HLW canister storage and removal

Process piping to be cut off flush with walls, floors and ceilings



## Vitrification Facility Deactivation



## Building/Facility Removal

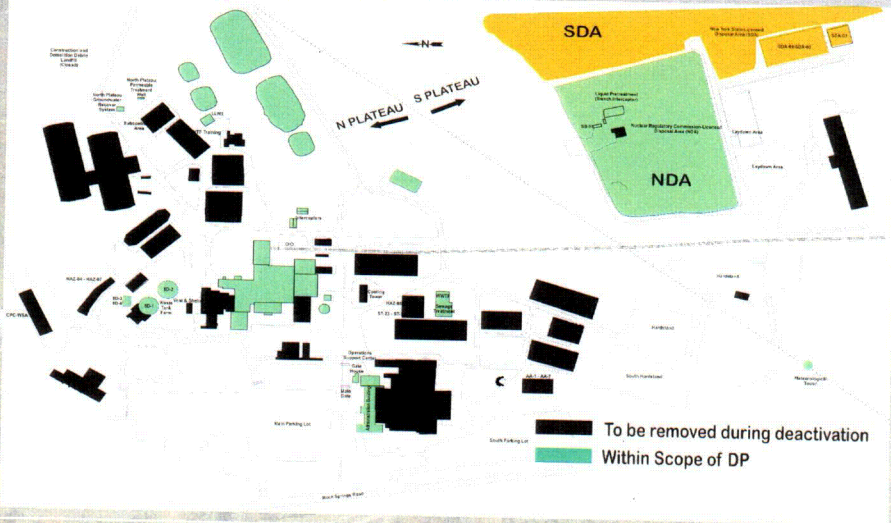
- DOE letter from T.J. Jackson to EIS Cooperating/Involved Agencies dated March 9, 2004
  - Identifies a list of excess buildings that will be removed in the next Contract Scope of Work
  - Identifies the proposed NEPA coverage
  - Indicates that building footprints will be cleaned up to meet LTR unrestricted release DCGLs
- These facility removal activities are outside the scope of the Decommissioning EIS and are assumed to occur prior to decommissioning

## Building/Facility Removal (cont'd)

| | |
|---|---|
| WMA 1 | 01-14 Building, Recirculation Vent System Building, Hittman Building, Laundry Room |
| WMA 2 | 02 Building, Test and Storage Building, Vit Test Facility, Maintenance Shop |
| WMA 3 | PVS Building, Equipment Shelter, STS Building, Vit Facility, Cold Chemical, HLW Transfer Trench, Con-Ed Building |
| WMA 5 | RHWF, Lag Storage Building, Lag Storage Addition (LSA) 1, LSA 3, LSA 4, CPC WSA, Hazardous Waste Storage Lockers |
| WMA 6 | Old Warehouse, Above-Ground Petroleum Tanks, Cooling Tower, Training Platforms, Salt/Sand Shed, Misc. Trailers |
| WMA 7 | Interim Waste Storage Facility |
| WMA 9 | RTS Drum Cell |
| WMA 10 | Environmental Lab, New Warehouse, Misc. Trailers |
| WMA 11 | Bulk Storage Warehouse |

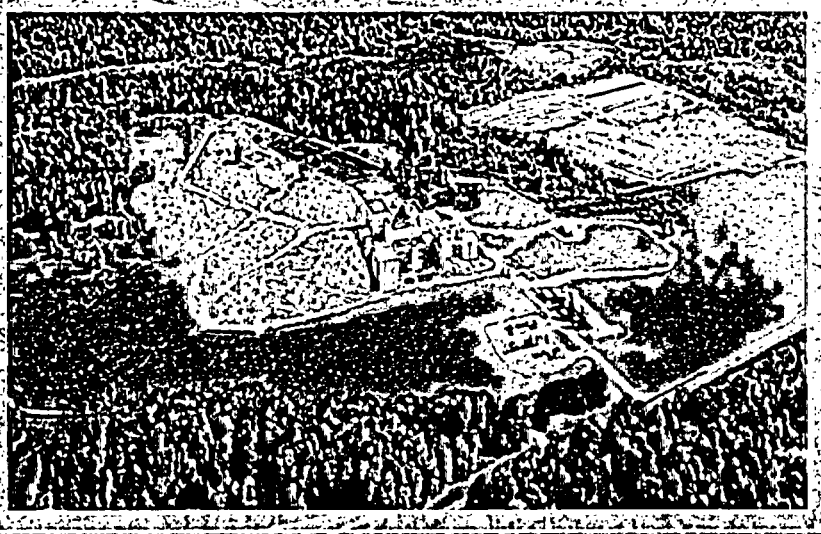


## Site Diagram



## WVDP Decommissioning
## Regulatory Framework

### Site Photo



### Regulatory Framework for WVDP Decommissioning

- WVDP Act
- DOE/NRC MOU
- NRC Implementation Plan

## WVDP Act

- Section 2(a)(5) – The Secretary shall D&D facilities used in accordance with such requirements as the Commission may prescribe
- Section 2(b)(4)(D) – A license amendment shall be submitted for conducting the Demonstration Project
- Section 2(c) – Review and consultation provided by the Commission shall be conducted informally and shall not include nor require formal procedures or actions by the Commission pursuant to the Atomic Energy Act, the Energy Reorganization Act, or any other law

## DOE/NRC MOU

- Section II.A.1 – "The Department has responsibility for the public health and safety associated with this project."

## NRC Implementation Plan

- Section 4.0, Overview of NRC's Approach
  - "It is important to note that DOE is not an NRC licensee at the West Valley site. DOE's decommissioning activities for the WVDP are conducted under the WVDP Act, as opposed to the AEA."
  - "It is expected that DOE's DP will contain most of the information normally contained in a standard DP. However, the DOE can refer to internal DOE regulations and DOE Orders to provide some of the information required by NRC to be in a DP."

## NRC Implementation Plan (cont'd)

- Section 6.0, Key Provisions from the Final Policy Statement
  - "Under the authority of the WVDP Act, the Commission is prescribing NRC's LTR as the decommissioning criteria for the WVDP"
  - Under the authority of the WVDP Act, the Commission is issuing criteria for the classification of reprocessing wastes that will likely remain in the tanks at the site after the HLW is vitrified. The Commission criteria that should be applied to incidental waste determination are: (1) waste should be processed to remove key radionuclides to the maximum extent that is technically and economically practical; and (2) waste should be managed so that safety requirements comparable to the performance objectives of 10 CFR Part 61, Subpart C, are satisfied."

## Applicability of NUREG-1757 Guidance

- The decommissioning of the WVDP is being conducted under the authority of the WVDP Act and not pursuant to NRC's regulatory authority under the AEA
- The applicability of the guidance developed for a standard decommissioning process under the AEA needs to be customized for the WVDP DP
  - Some sections are applicable
  - Some sections are not applicable
  - The guidance needs to be supplemented in order to address site specific issues

## Applicable Sections of Standard DP

- The fundamental purpose of the WVDP DP is to "provide the basis for NRC's determination of whether the preferred alternative will meet the decommissioning criteria in accordance with the WVDP Act."
- Therefore, emphasis will be placed on those sections of NUREG-1757 that contain information that is relevant to assessing whether the LTR has been met
  - Planned Decommissioning Activities (End State)
  - Radiological Status of Facility
  - Dose Modeling
  - ALARA Analysis
  - Final Status Survey (FSS)

## Non-Applicable Sections of Standard DP

- Programmatic sections that are under DOE regulatory authority
  - Health and Safety Program During Decommissioning
  - Environmental Monitoring and Control Program
  - Radioactive Waste Management Program
  - Quality Assurance Program (Exception is FSS)
  - Project Management and Organization (Exception is FSS)
- In these cases, DOE regulations and orders will be referenced and no attempt will be made to provide "how to" details
- Sections that do not apply to government agencies
  - Financial Assurance

## Information Not Normally Contained in a DP

- A section will be added to the WVDP DP to address the analysis of incidental waste

## Summary

- The starting point for the WVDP DP is more than four years in the future and does not include near-term facility deactivation/removal and waste management activities
- The standard DP checklist in NUREG-1757 needs to be modified to reflect that the Demonstration Project is being decommissioned under the WVDP Act and not the AEA

The West Valley Demonstration Project Decommissioning Plan

# Decommissioning Approach and Scope

A Briefing for the U.S. Nuclear Regulatory Commission

Frank McCoy

March 23, 2004

## Objective

To generally describe the WVDP decommissioning approach and scope that will implement DOE's preferred alternative for the Decommissioning EIS

The presentation will not cover:
- Radiological status
- Decommissioning Plan content
- The performance assessment

These will be addressed separately.

DOE's Approach (Preferred EIS Alternative)
for the WVDP Decommissioning

## Key points

**A phased decommissioning approach tailored to the complex site**

- The Decommissioning Plan will provide for a phased decommissioning approach
- Phase 1 will maintain the deactivated Process Building capable to safely store and remove the HLW canisters and will decommission the remainder of the WVDP facilities.
- Phase 2 will safely store the HLW canisters in the deactivated process building such that they can be maintained by a government agency until the repository is available to receive them.
- Phase 3 will remove and ship HLW canisters, decontaminate and decommission the Process Building and support areas and complete final status surveys and final preparations of WVDP project premises for surrender to NYSERDA under NRC license such that LTR can be met.

## Key points

**A decommissioning approach that meets NRC's LTR**

- The Decommissioning Plan will decommission facilities used in the WVDP to achieve residual radioactivity criteria prescribed by NRC's License Termination Rule for restricted release
- A performance assessment will be used to predict potential future radiation exposure from residual radioactivity
- DCGLs will be established for decontamination criteria
- Final status surveys using MARSSIM protocols will confirm that decontamination has been successful to meet the LTR

## Key points

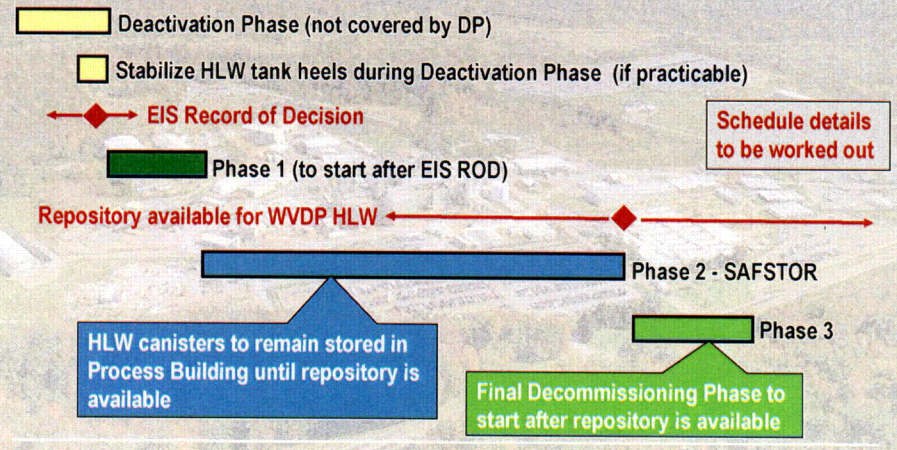
A decommissioning approach that will reflect changes in deactivation and in the EIS

- The Decommissioning Plan will be maintained as a living document with NRC approval of changes as appropriate, such as:
  - Changes related to completion of deactivation activities
  - Changes related to the EIS Record of Decision
- The DP will be "government neutral"
  - Where responsibility for activities under the plan is not yet resolved, the DP assumes that responsibility will lie with the Federal government (DOE), the State (NYSERDA), or with some combination of the 2 governments to be determined



## Conceptual schedule

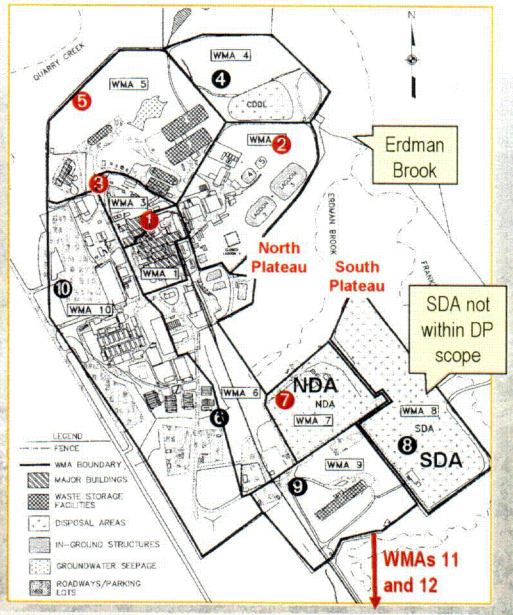
Reflecting the general sequence for the decommissioning approach



DOE's Approach (Preferred EIS Alternative)
for the WVDP Decommissioning

## Phase 1

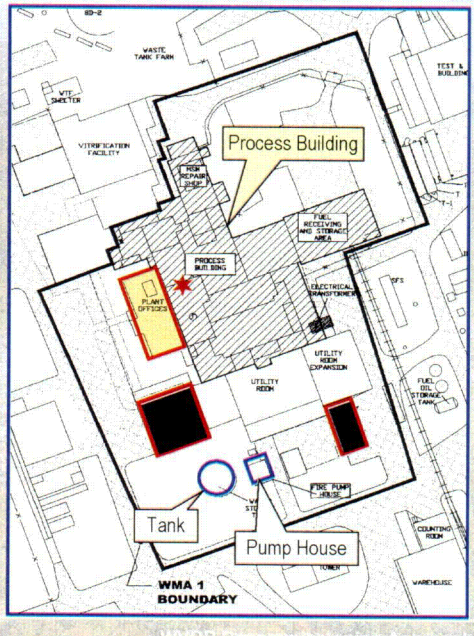
- Phase 1 activities under the DP fall within
  - WMA 1 Process Building
  - WMA 2 LLWTF/lagoons
  - WMA 3 HLW tanks
  - WMA 7 NDA stabilization
  - WMA 11 test wells
  - WMA 12 school house





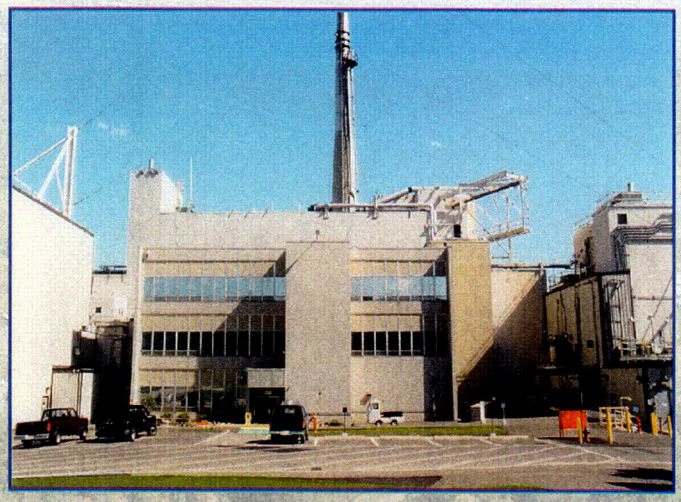

## Phase 1 - WMA 1

- The deactivated process building will be maintained capable to safely store and remove the HLW canisters
- Remaining operational until Phase 3
  - Plant Office Building
  - Fire Pump House and Water Storage Tank
  - Electrical Substation
  - Other systems required for HLW canister storage/removal and contamination control



DOE's Approach (Preferred EIS Alternative)
for the WVDP Decommissioning

## Phase 1 - WMA 1



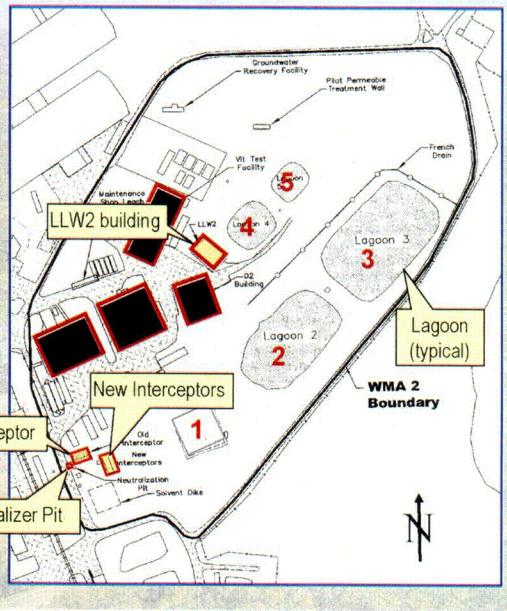
PROCESS BUILDING



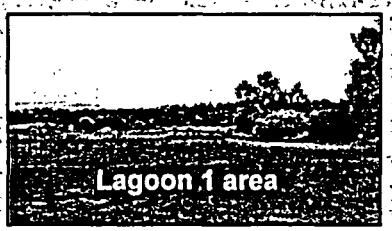
## Phase 1 - WMA 2

- Lagoons to be decontaminated and decommissioned*
- Facilities to be removed
  - LLW2 Building
  - Neutralizer Pit
  - Interceptors

*After stabilizing the NDA as discussed in WMA 7

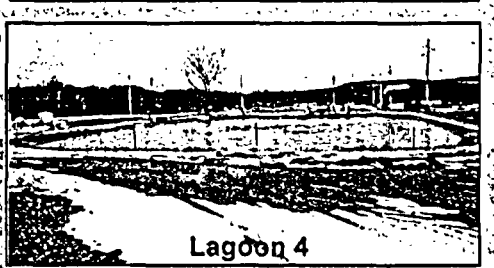


## Phase 1 - WMA 2




Lagoons 2, 3, 4, and 5 will be pumped dry. The liners will be removed from Lagoons 4 and 5 (2 and 3 are unlined). Residual radioactivity will be exhumed and the soil in the areas remediated to DCGLs, surveys performed and independently verified, and the cavities filled with earth.

Lagoon 1 contains contaminated debris – asphalt, trees, stumps, and weeds – covered with clay and earth. The radioactive debris will be removed and the soil remediated to DCGLs, surveys performed and independently verified, and the cavity filled with earth.




## Phase 1 - WMA 2

The Interceptors and the Neutralizer Pit will be removed and any contaminated soil in their footprints remediated to soil DCGLs, surveys performed and independently verified, and the cavities filled with earth.

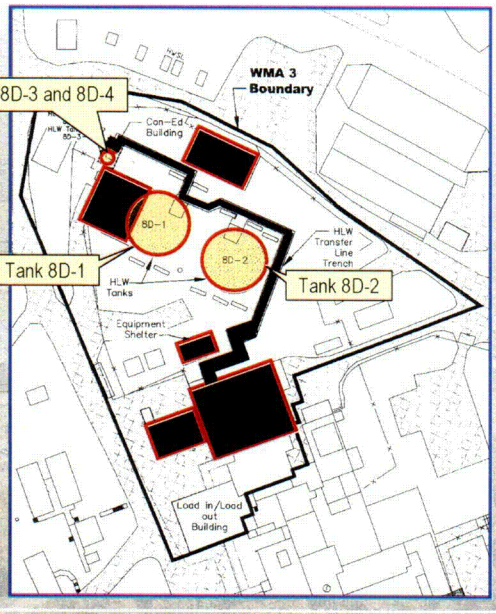
The Interceptors were used to collect waste water for sampling before transfer to Lagoon 2. The Old Interceptor was an open unlined concrete tank; the 2 New Interceptors are lined with stainless steel.

The Neutralizer Pit is a smaller concrete tank used to collect waste from process areas.

DOE's Approach (Preferred EIS Alternative)
for the WVDP Decommissioning

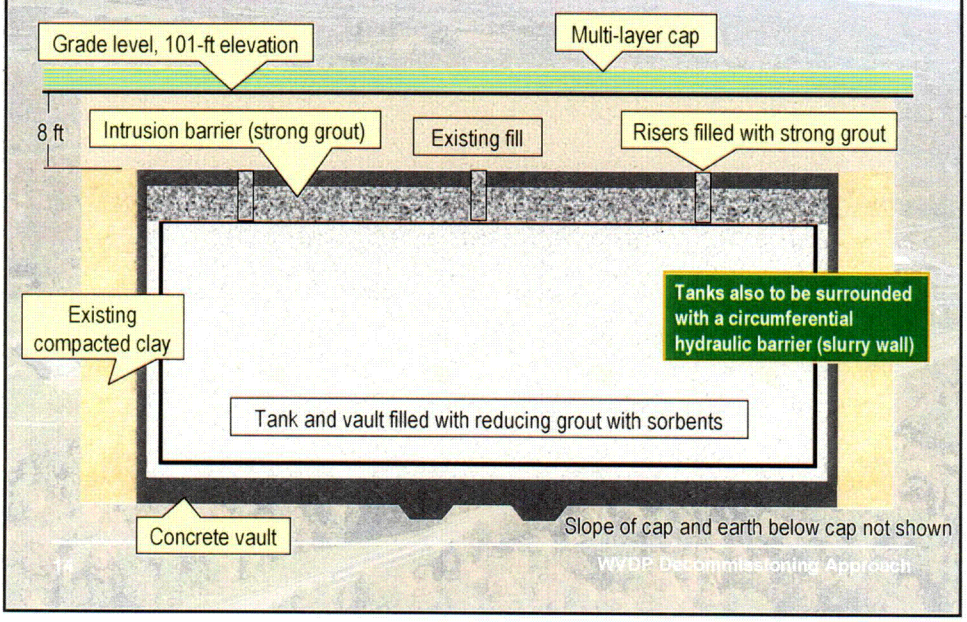
## Phase 1 - WMA 3

- The HLW tanks will be closed in place
  - Tanks and vaults filled with reducing grout and sorbents
  - Topped with high strength grout intrusion barriers
  - Capped with fill and a multilayer cap
  - Surrounded by a circumferential hydraulic "slurry wall" barrier






## HLW tank closure concept

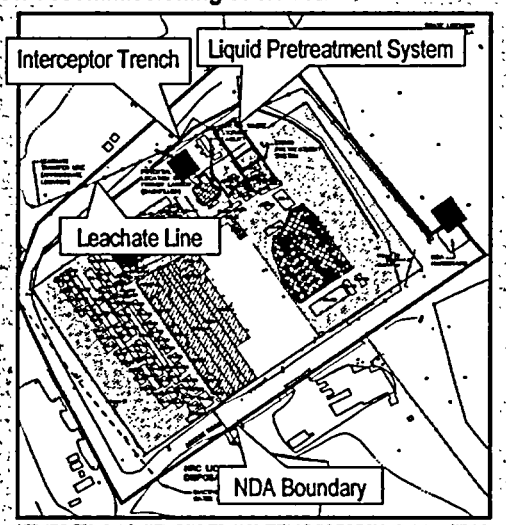


DOE's Approach (Preferred EIS Alternative)
for the WVDP Decommissioning

## Phase 1 - WMA 7

**Stabilization of NDA to allow decommissioning of WMA 2**

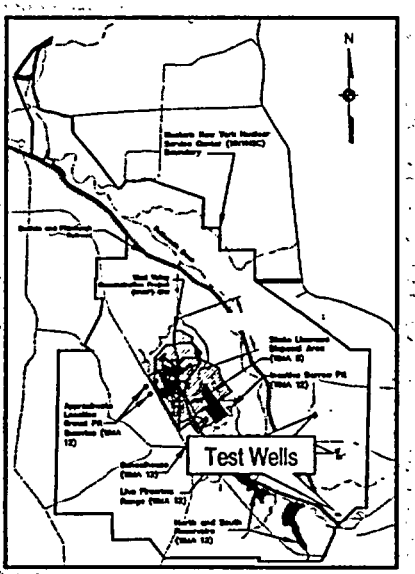
- Interceptor Trench to be grouted
- Liquid Pretreatment System to be removed
- Leachate Transfer Line to be grouted
- NDA to be surrounded by a slurry wall and covered with a geomembrane cap




## Phase 1 – WMA 11

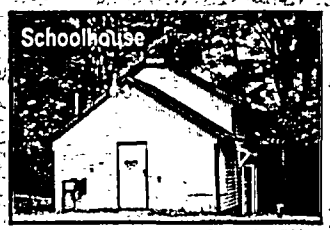
- Hydrofracture test well area to be grouted

***ORNL installed these 5 wells in 1969 in connection with a pilot study – Zr-95 was used as a tracer.***

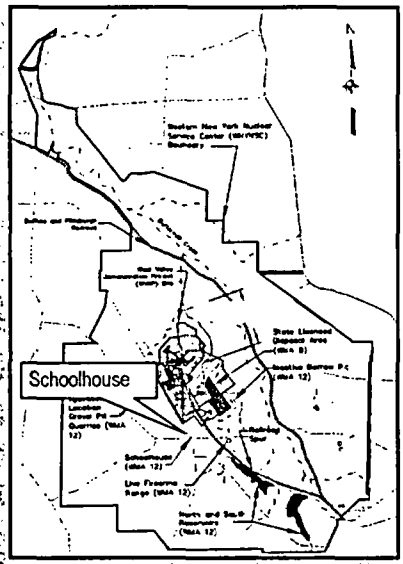


## Phase 1 – WMA 12

- To be surveyed and left in place
  - School House




*No radioactive contamination is expected*



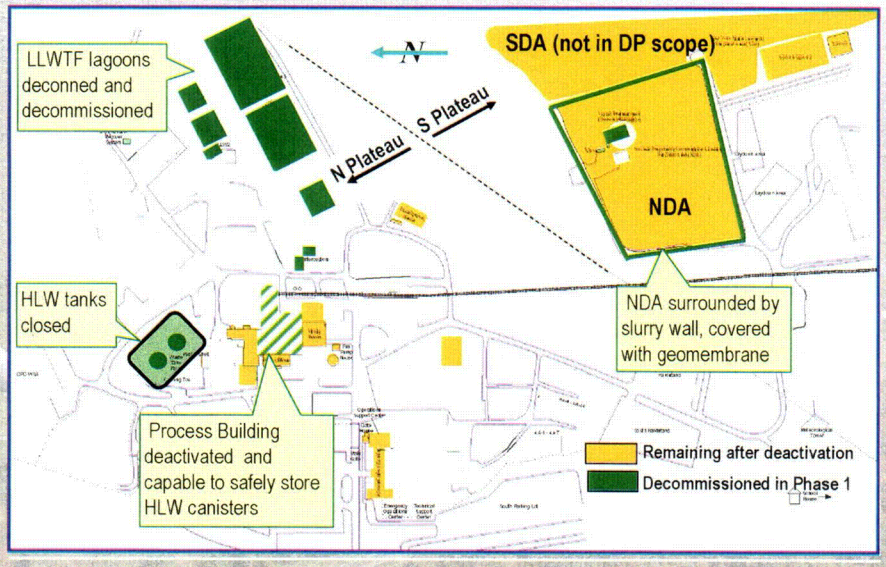

## Phase 1 – all areas

Contaminated subsurface and embedded piping

- Contaminated underground piping and equipment will be removed, except in cases where source terms were considered in the performance assessment and found to be acceptable under the cleanup criteria
- Subsurface piping and equipment is now being evaluated
  - Decommissioning Plan will reflect details

DOE's Approach (Preferred EIS Alternative)
for the WVDP Decommissioning

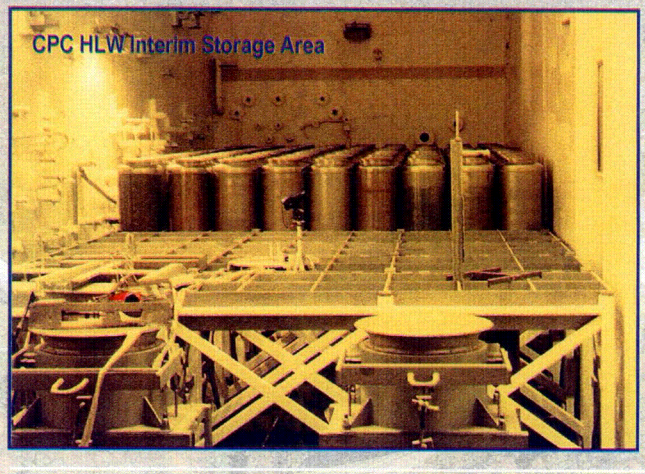
## At the end of Phase 1






## Phase 2 - SAFSTOR

After Phase 1, and during Phase 2, the 277 HLW canisters will remain in the CPC until the repository becomes available




**Systems required for safe storage and contamination control to remain operational.**

DOE's Approach (Preferred EIS Alternative)
for the WVDP Decommissioning

## Phase 3

Final phase will include removal and shipping HLW and preparing facilities for surrender to NYSERDA

- Removing HLW canisters and shipping them to repository
- Decontaminating and decommissioning process building
- Decommissioning remaining support areas
- Completing remaining final status surveys to confirm LTR met
- Formal turnover of WVDP project premises to NYSERDA

## Phase 3

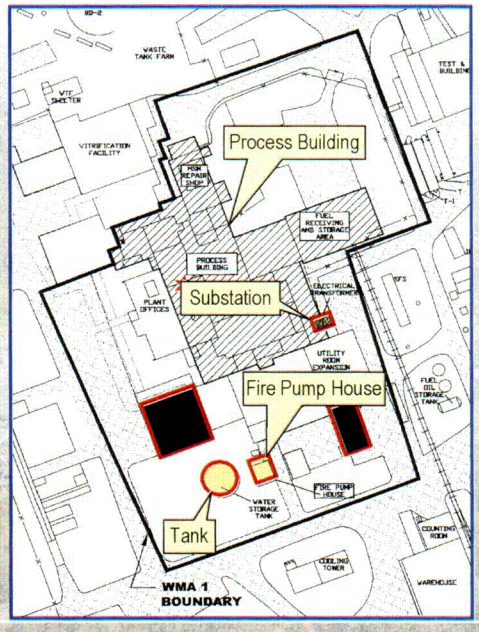
Transporting the HLW canisters to the repository

- The canisters will be
  - Moved thru the EDR into the Load-In/Load-Out Area
  - Placed in their transport containers
  - And transported to the repository by rail or by truck

DOE's Approach (Preferred EIS Alternative)
for the WVDP Decommissioning

## Phase 3 - WMA 1

- Remaining Process Building systems will be removed
- Process Building will be decontaminated, decommissioned and left standing
- Also to be decommissioned and left standing are
  - Fire Pump House and Water Storage Tank
  - Electrical Substation
  - Plant Office Building

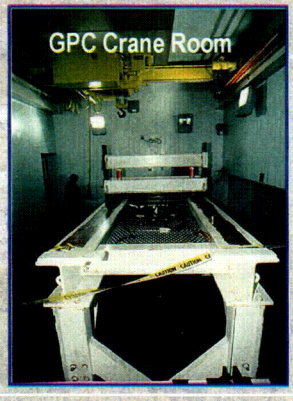





## Phase 3 - WMA 1

Process Building interior surfaces, including the fuel pools, are to be decontaminated to DCGLs based on performance assessment modeling for maintenance worker occupancy under restrictions and for intruders if institutional controls were to fail.

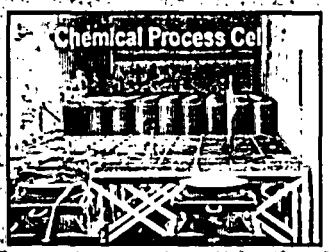
Remaining contaminated piping penetrating walls, floors, and ceilings will be removed



DOE's Approach (Preferred EIS Alternative)
for the WVDP Decommissioning

## Process Building

Areas where significant decontamination will be necessary



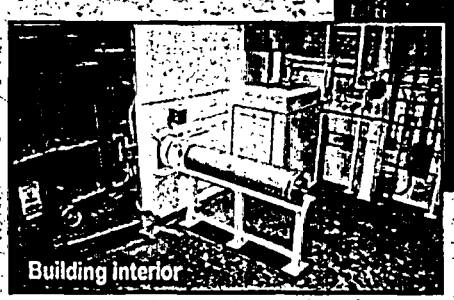

In the CPC:

- In 1994, floor dose rates averaged 0.83 R/h before final decon and 2 sumps were reading 4.6 R/h and 15.5 R/h.
- Contamination was painted over before canister racks were installed.
- There has been no personnel access in the CPC since the plant began operation.

After the last decontamination efforts, radiation levels near the floor of the EDR were typically in the 3 – 50 mR/h range, with 1.5 R/h in the sump.

## Process Building

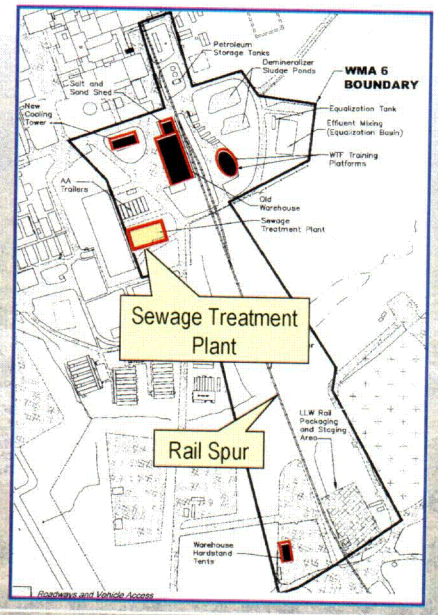
Load-In/Load-Out Area to be removed



DOE's Approach (Preferred EIS Alternative)
for the WVDP Decommissioning

## Phase 3 - WMA 6

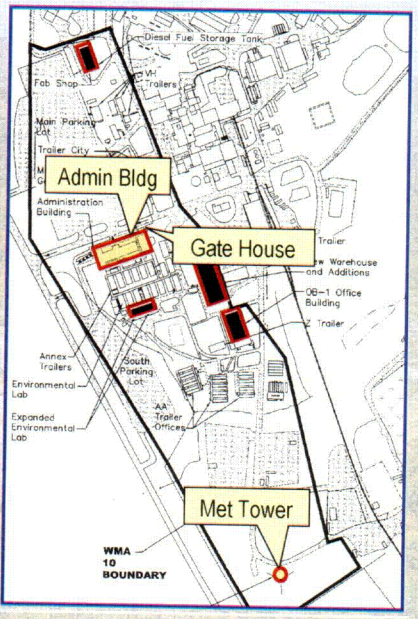
- To be surveyed and left in place
  - Rail Spur (after last HLW cask shipment)
  - Sewage Treatment Plant
  - Equalization Basin
  - Equalization Tank






## Phase 3 – WMA 10

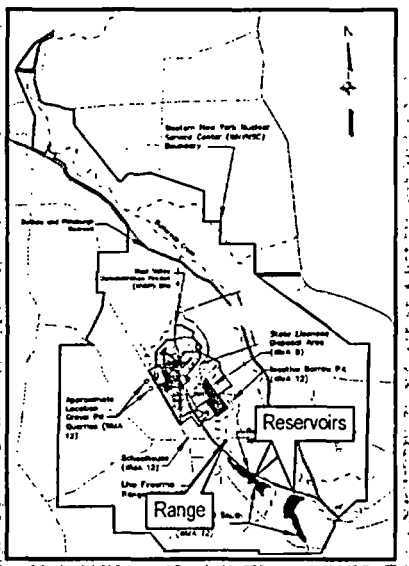
- To be surveyed and left in place
  - Administration Building
  - Gate House
- To be removed
  - the Meteorological Tower



## Phase 3 – WMA 12

- To be left in place
  - Live Fire Range
  - Dams and reservoirs

*No radioactive contamination in these facilities is expected*

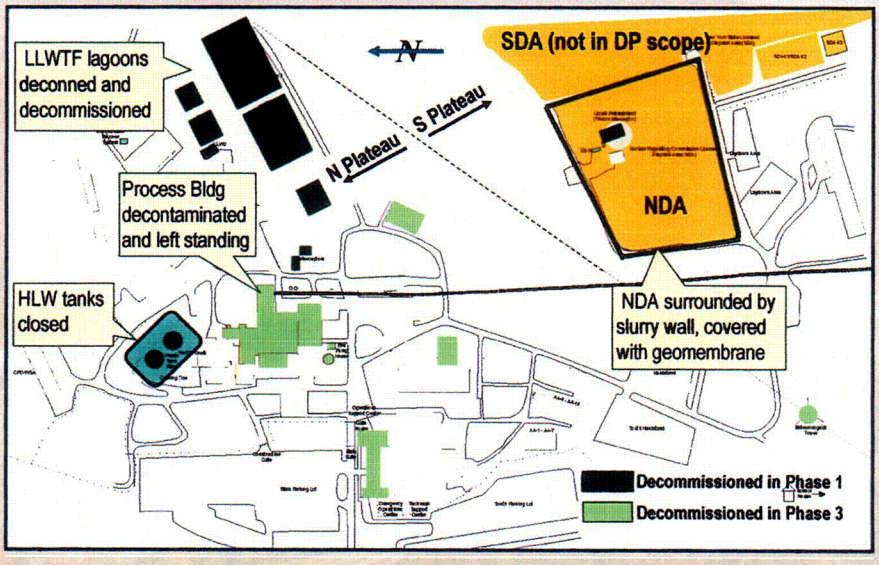



## Final status surveys

Will be outlined in the Decommissioning Plan

- Surveys will follow MARSSIM protocols
- A phased approach is planned
  - Final characterization surveys performed at the end of deactivation will be considered for endorsement
  - Where areas are completely decontaminated and can be effectively isolated, surveys will be done area by area
  - Confirmation surveys by an independent DOE subcontractor will be included
- Surveys will ensure DCGLs have been achieved and that residual radioactivity meets LTR requirements for license termination under restriction in DOE areas

## At the end of Phase 3






## In summary

The major points that have been addressed

- The DP will describe how DOE's preferred alternative for the Decommissioning EIS will be implemented
- The DP will provide for a phased decommissioning approach
- The DP will enable maintenance of high level waste canisters during SAFSTOR by an appropriate government agency
- The DP will assure NRC's LTR for restricted release is met
- The DP will enable eventual surrender of the project premises to NYSERDA for maintenance under NRC license with LTR met
- The DP will be maintained as a living document with appropriate NRC approval of changes and will reflect any changes from deactivation and the EIS.





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