

# Decommissioning, and LTP Update

Meeting with USNRC

August 17, 2004

# Discussion Topics

- Decommissioning Update
- Groundwater Monitoring Results Update
- Building Characterization Results
- Status of Biennial LTP Update
- LTP Amendment Approach
  - Conceptual Model
  - Dose Calculation Methodology
  - Implementation
- Summary and Schedule

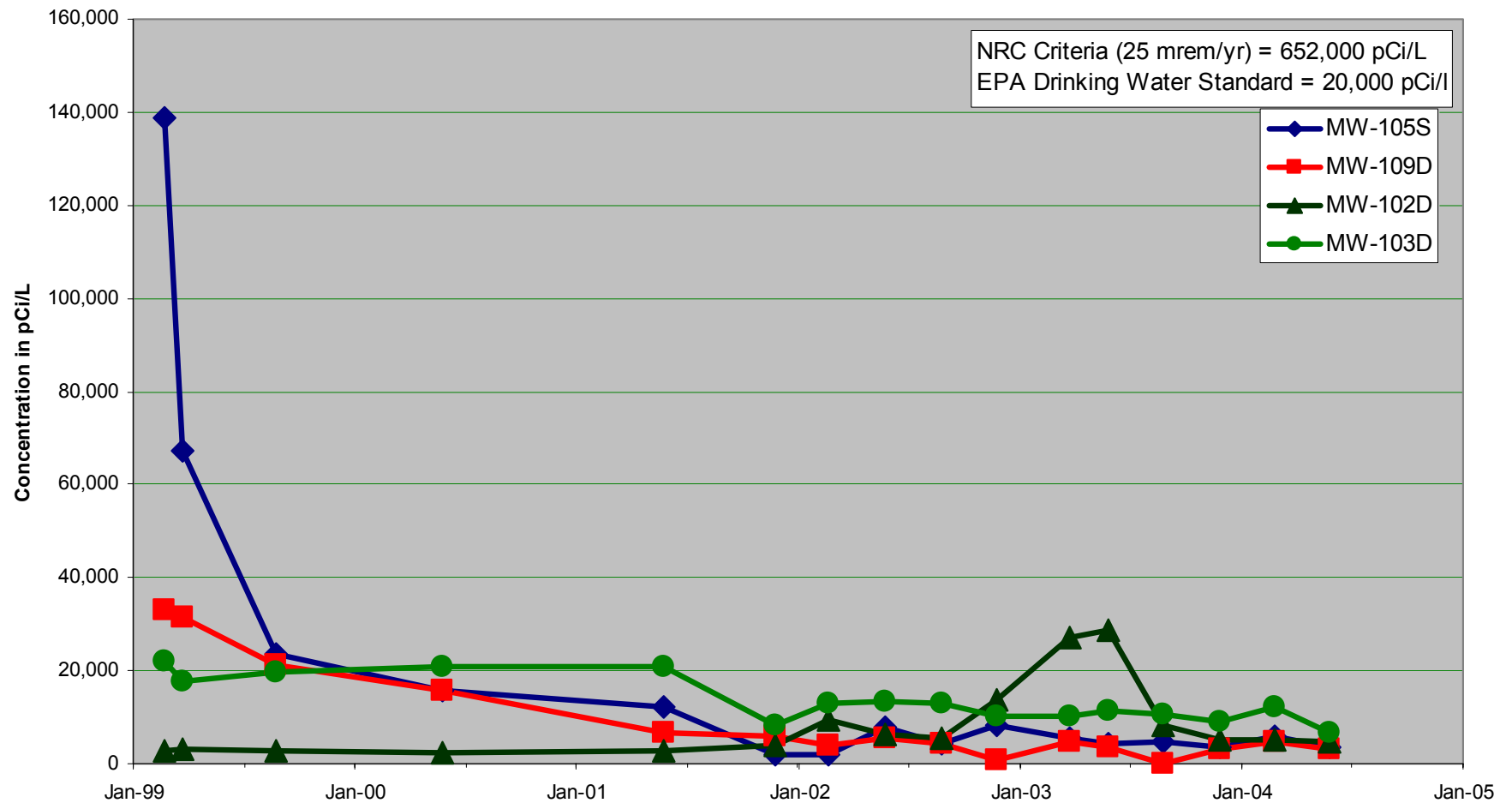
# Decommissioning Update

- |  |          |
|--|----------|
| • FSS of 400 Acres - Class 2 and 3 Areas   | Complete |
| • ORISE Inspection of 400 Acres            | Complete |
| • FSS of Landfill Area – Class 1 & 2 Areas | Complete |
| • 13 of 43 Canisters Located at the ISFSI  | 8/12     |
| • Secondary Side Building Removal          | Begun    |
| • Complete Tank Farm Soil Removal          | 11/04    |
| • Start RCA Building Removals              | 8/04     |
| • Complete Fuel Transfer                   | 1/05     |
| • Complete Physical Decommissioning        | 12/06    |
| • Release Non-ISFSI Areas From License     | Mid-2007 |

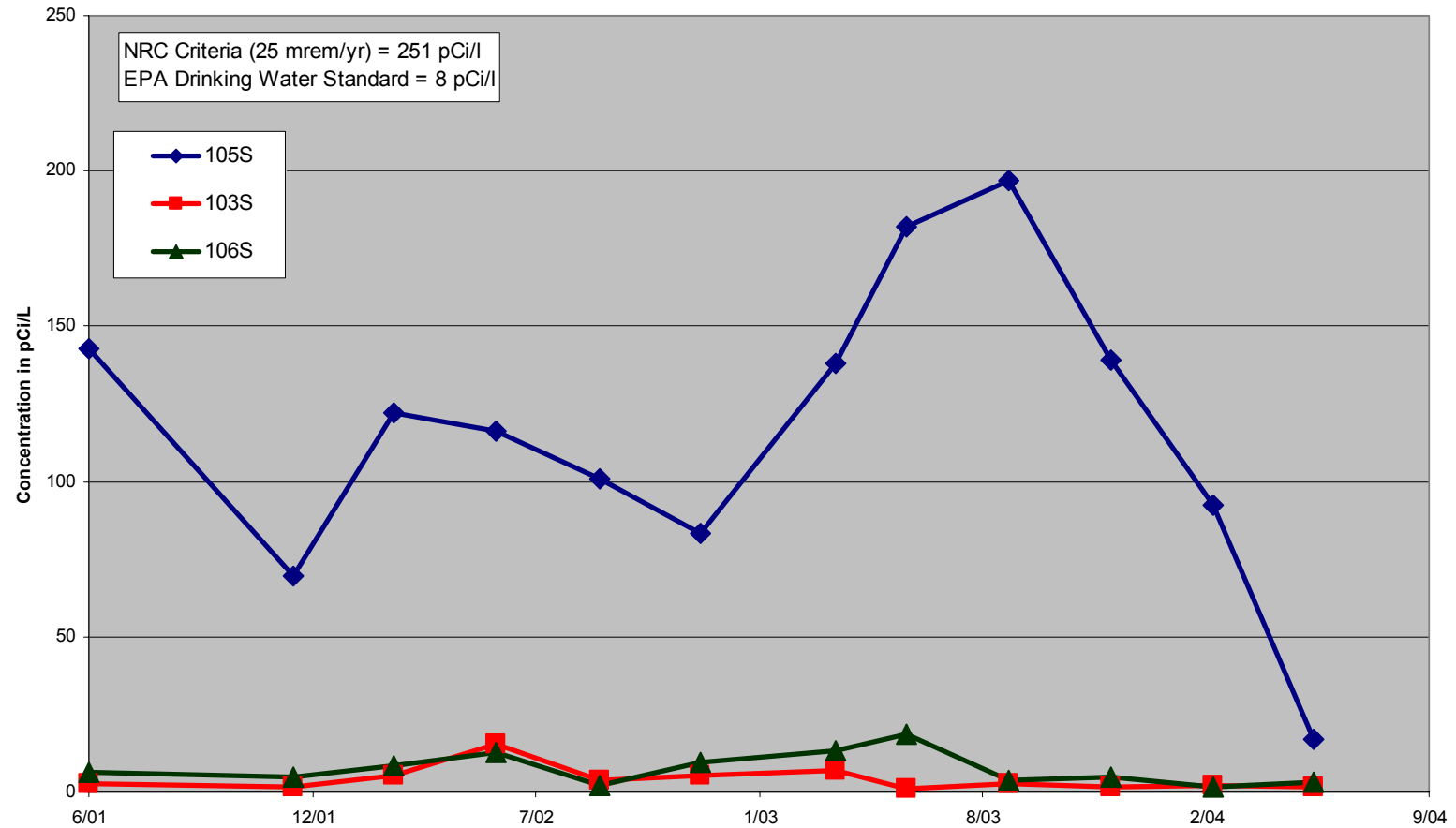
# Biennial LTP Update

- 10 CFR 50.71(e) requires an update of the LTP at least every 24 months
- LTP Update Issuance expected by the End of August
- Changes are the same as discussed on 3/9/04
- No changes have triggered Prior NRC Approval due to the LTP License Conditions or 10CFR 50.59 Criteria

# Tritium Trend

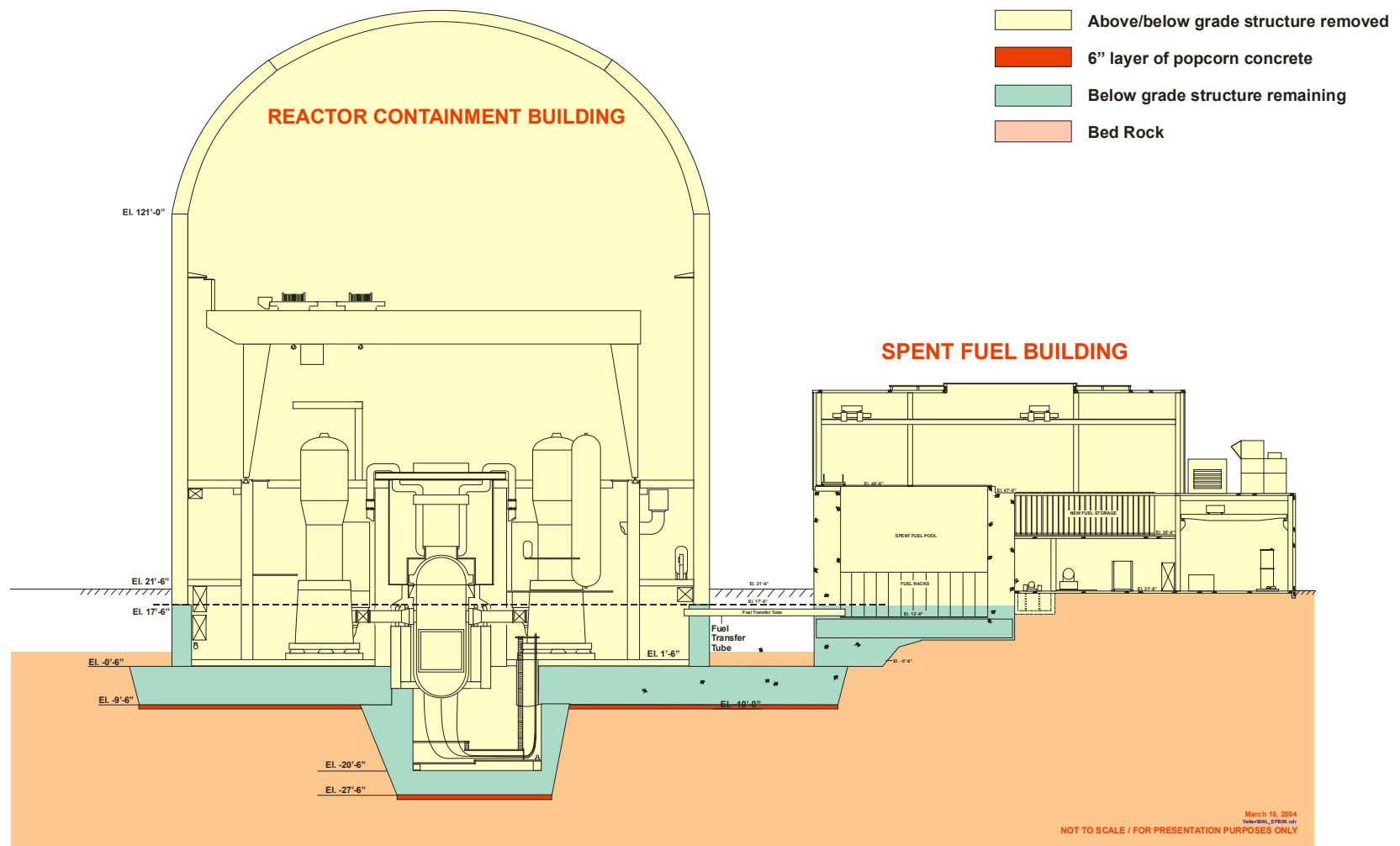


# Strontium-90 Trend



# GW Source Identification





CONNECTICUTYANKEE ATOMIC POWER COMPANY  
GENERAL ARRANGEMENT DRAWING

**POTENTIALLY CONTAMINATED BELOW GROUND CONCRETE**





# Building/Pipe Characterization

- Concrete Cores Taken In:
  - RHR Pit
  - Cable Vault
  - Containment Walls and Mat (Also Bedrock Cores)
  - In-Core Sump
- Analyzed for:
  - Gamma Radionuclides
  - Tritium
  - Selected Samples analyzed for
    - Transuranic Radionuclides
    - Sr-90
    - Other Hard to Detect Radionuclides
- Containment Sump RHR Suction Line Survey

# Building Characterization Results

- RHR Pit of the Primary Auxiliary Building
  - Significant Interior Surface Contamination
  - H-3 Volumetric Contamination of Pit Wall near to Former RWST Area below 25 mrem/yr DCGLs
  - Decision: Remove Entirely
- Cable Vault
  - Low Internal Surface Contamination
  - H-3 & Sr-90 Volumetric Contamination of Walls and Floors below 25 mrem/yr DCGLs
  - Decision: Remove to 4 foot Below Grade

# Building Characterization (Cont.)

- Containment Areas other than In-Core Sump
  - Significant Surface Contamination of Internal Floors
  - Volumetric Contamination of Concrete outside of the Containment Liner below 25 mrem/yr DCGLs:
    - Primarily H-3, Other Radionuclides well below DCGLs
  - Decision: Remove Concrete to Containment Liner
- Containment In-Core Sump
  - One Sample (Area of expected highest activation under Reactor)
  - Estimates of Levels of H-3 in Concrete to Remain Significantly Higher than Current Volumetric DCGL
  - Decision: Difficult Remediation - Use Basement Fill Model

# Building Characterization (Cont.)

- Containment Sump RHR Suction Line
  - Initial Contamination Levels Approximately 1 Million dpm/100cm<sup>2</sup>
  - Pipe Decon conducted using 40,000 psi Hydrolazer
  - 9 Full Passes of Embedded Pipe
  - Post Decon Survey: No Contamination over Background
  - FSS of pipe to be conducted when exterior soil has been removed in October 2004 time frame

# LTP Revision 1a Demolition Approach

- Decontaminate Building to Surface and Volumetric DCGLs
- Conduct Final Status Survey with Building Standing
- Buildings Demolished to 3 foot below grade
- Demolition Debris used to backfill the basement

# Dose Modeling and Final Status Surveys

- Land Areas

- Three Dose Pathways Included

- Soil

- Existing Groundwater

- Areas Impacted by Aquifer Plume

- Buildings

- Groundwater from Buried Debris



Resident Farmer

$$25mr / yr \geq D_{Total} = D_{Soil} + D_{Existing GW} + D_{GWfromDebris}$$

# Revised Demolition Approach

- **Containment Basement:**
  - Remove Internal Concrete to the Containment Liner
  - Perform Final Status Survey of Surfaces and Volumetric Contamination to Building Occupancy DCGLs Except for Inaccessible Areas;
    - Piping to be grouted
    - In-core Sump rendered inaccessible with “Flowable Fill”
  - Calculate “Future Groundwater” Dose with “Basement Fill Model”
  - Backfill Basement w/Clean Fill to Approximately 3 ft below grade (includes a protective membrane covered with 1 foot of fill)
  - Dispose of Building above 4 ft below grade, membrane and sacrificial fill above membrane as Rad Material
  - Survey Surface of fill remaining at 4 ft below grade
  - Backfill to grade with clean fill and conduct Surface and Subsurface Final Status Surveys after Isolation and Controls established

# Revised Demolition Approach (Cont.)

- **Fuel Building Spent Fuel Pit:** Same Approach as Containment except that liner is to be removed
- **Other RCA Building Basements to Remain** (such as B Switchgear & Cable Vault with very low contamination history)
  - Characterization Results indicate that Decontamination of Basement may not be required
  - Membrane and Sacrificial fill layer may not be required due to low contamination history of structure above 4 foot below grade
  - Otherwise approach is same as Fuel Building



# Basement Fill Model

- Calculates Dose from “Future Groundwater”
- Determines Total Activity Inventory Available for Release to Groundwater from:
  - Liner and Embedded Piping Inside Surfaces
  - Radioactivity Released from Volumetric Contamination Controlled by Diffusion Rate thru Basement Walls and Flowable Fill (Based on Brookhaven Lab Diffusion Study) for:
    - Containment Walls and Floor Mat
    - In-Core Sump (Includes Flowable Fill)
    - Spent Fuel Pit

# Basement Fill Model (Cont.)

- Equilibrium Calculated between Backfill Soil and Groundwater for each Basement
- Assumptions of Basement Fill Model:
  - Backfill Material  $K_d$  to be determined by Testing of Actual Backfill Soil Samples at Brookhaven Lab
  - No Recontamination of Liner Walls
  - No Credit for Containment Liner

# Basement Fill Model (Cont.)

- Resulting Groundwater Concentration will be compared to the Groundwater DCGL in HNP LTP Revision 1a to determine dose from “Future Groundwater”
- For Land Areas which include a Building Basement, Sum of Doses to Show compliance Includes:
  - Soil Dose (per HNP LTP Revision 1a)
  - Existing Groundwater Dose (per HNP LTP Revision 1a)
  - “Future Groundwater” Dose calculated by “Basement Fill Model” (Per Proposed License Amendment)

# Chapters Effected By LTP Amendment

- Chapter 2 – Summary of Concrete Characterization Results
- Chapter 5
  - Core Samples Required for “Future GW” dose calculation: (See Table at right)
  - Additional Buried Pipe Release Values for Additional Pipe Sizes

Building	Charact. Samples	FSS Samples
Containment Walls	4	6
Containment Mat	8	6
In-Core Sump	1 Taken 4 Planned	4
Spent Fuel Pool	6 Planned	6
Cable Vault	7	6

# Chapters Effected by LTP Amendment (Cont.)

- Chapter 6
  - Details of Basement Fill Model
  - Method of Calculation of Dose - Basement Fill Model
  - Summary of Brookhaven Concrete Diffusion Study
  - Summary of Brookhaven Backfill Soil Kd Study

# Summary and Schedule

- Submittal of Amendment in September
- Will Include
  - Method to be used to Calculate Future Groundwater
  - Estimate of Future Groundwater Dose based on Characterization Results to Date
- Approval Needed by May 2005 to support Demolition Schedule
- Questions/Discussion