Yankee Atomic Electric Company
Groundwater Closure Plan

Meeting with USNRC

June 22, 2006

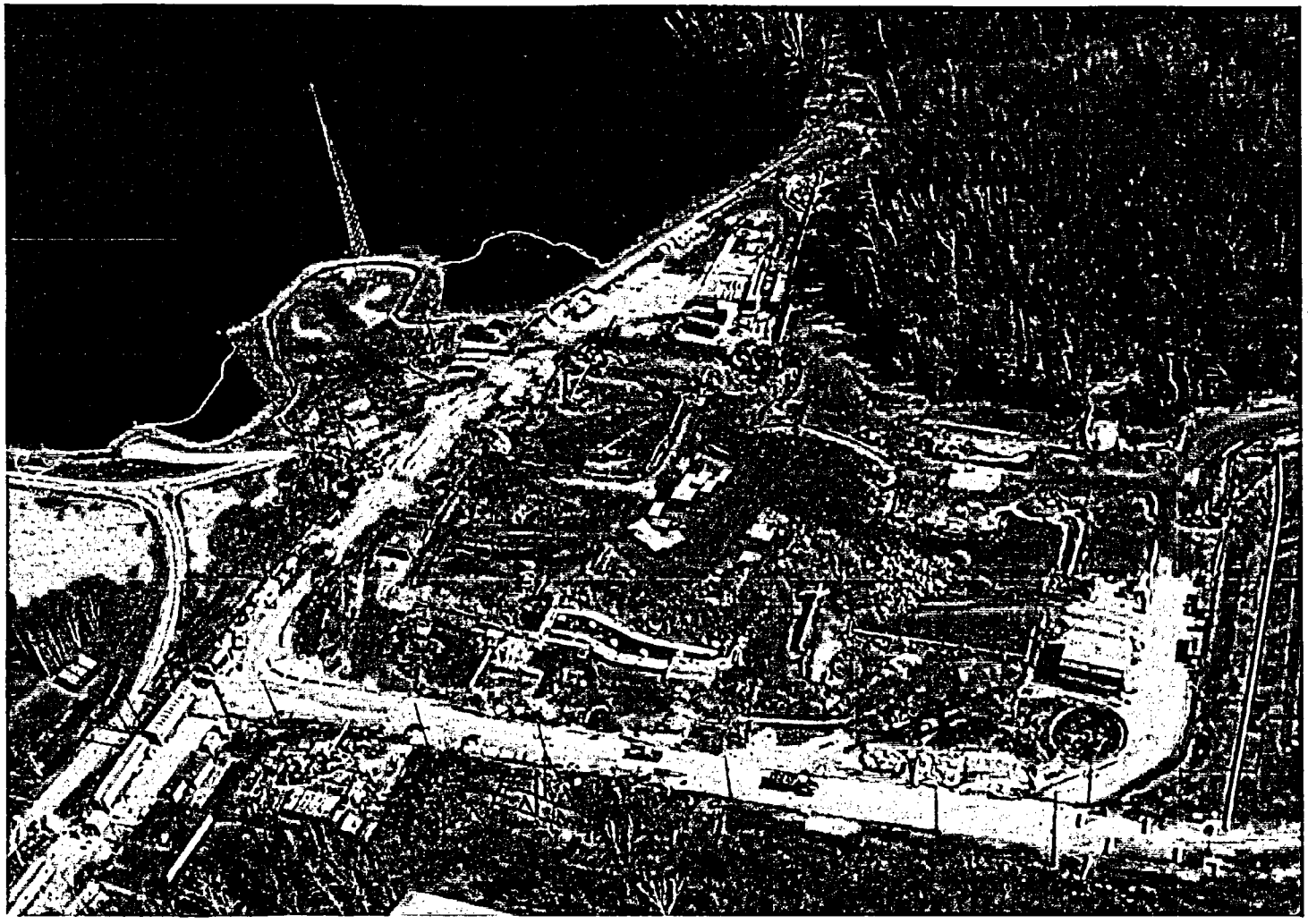
Agenda

- Decommissioning Status
- Site End State
- Groundwater Monitoring History
- Recent Groundwater Activities
- Groundwater Closure Plan
- Fate and Transport Model
- Sampling Schedule
- Questions

Decommissioning Status

- Finalizing Remediation Activities
- Establishing Final Site Grade by 9/06
  - Removing Final Structures and Piping
  - Stockpiling Soil for Final Grade
  - Shipping Contaminated Soil
- Completing Final Status Survey Field Work by 9/06
- Groundwater Monitoring Ongoing
- Goal: Terminate NRC License for Property Outside ISFSI by July 2007

YNPS April 2006



Site End State

- Site Will Meet LTP Criteria
  - <25 mrem/yr TEDE + ALARA
  - <20,000 pCi/L H-3
    - "Resident Farmer's" Well
    - Offsite Down-Gradient Monitoring Wells
- Minimal Structures Will Remain Outside ISFSI
  - Partial Structures - MADEP "No Detectable" Criteria
  - Buried Commodities - Free Release Criteria
  - ISFSI Support Buildings - Free Release Criteria
- ISFSI Will Remain

Groundwater Monitoring:1997-2001

- 34 Monitoring Wells
  - Generally Shallow Locations
  - Distributed Throughout Site
- Low Levels of H-3 :
  - Decreasing Trend Since 1997
  - July 2000: Up To 5,000 pCi/L (MW-5, Under VC)
  - April 2001 Up To 6,400 pCi/L (CB-10, Ion Exchange Pit)
- No HTD or Gamma-Emitting Nuclides

Groundwater Monitoring: 2002-2003 Data Gaps Addressed

- 12 New Wells Installed
  - 7 "Bedrock" Wells
  - 5 Deep/Shallow Well Pairs
- "Nested Boulder" Layer Under VC Characterized
- Extent of Down Gradient Contamination Defined
- Potable Water Well as Bedrock Background
- New Procedures For Drilling, Sampling and Analysis

Groundwater Monitoring: 2003 Summary of Results

- Tritium:
  - Generally Low Levels in Industrial Area Shallow Aquifer (2,000 – 6,000 pCi/L)
  - Up to 46,000 pCi/L Identified in One Location Near SFP (MW-107)
- No HTD or Gamma-Emitting Nuclides

Groundwater Monitoring: 2004 Continued Improvements

- Installed 10 New Wells
  - 3 Bedrock Wells, 3 Deep / Shallow Clusters
  - Bound Extent of H-3 Plume at 3 Key Locations
  - Define Hydrogeological Features of Site
- Installed Data Logging Transducers
- Installed Data Logging Rain Gage

Groundwater Monitoring: 2004 Summary of Results

- Tritium:
  - Generally Low Levels in Industrial Area Shallow Aquifer (1,000 – 7,000 pCi/L)
  - 42,000 pCi/L Identified in One Location Near SFP (MW-107C)
- No HTD or Gamma-Emitting Nuclides
- Some Hydraulic Connections Noted
- 22 Wells Permanently Abandoned for D&D
- SFP Emptied and Drained

Groundwater Monitoring: 2005 Focus on D&D

- Groundwater Related Activities Limited Due to D&D Activities
  - Source Term Areas Remediated
  - Wells Sampled in Beginning and End of 2005
- Tritium:
  - Shallow Locations Increased Following Uncovering of Soil and Concrete Removal Areas
  - Deeper Wells Generally Unchanged
- No HTD or Gamma-Emitting Nuclides

Groundwater Monitoring: 2006 Groundwater Work Underway

- Sampling Continuing
  - Quarterly Sampling
  - Selected Monthly Sampling for Tritium
- Additional Wells Installed
  - 2 Cluster Near SFP (MW-110, MW-111)
  - 1 Cluster Down Gradient (MW-113)
  - 2 New Wells to Define MW-107 Sand Lenses
- Aquifer Characterization Test In Progress
- LTP Groundwater Monitoring Plan Drafted

LTP Groundwater Monitoring Plan: Objectives

- Define Criteria for LTP Compliance Demonstration
- Identify Activities Required to Gather Additional Modeling Information
- Define Process to Demonstrate Groundwater Concentrations Comply with LTP
- Identify Completion Schedule and Documentation Requirements

LTP Groundwater Monitoring Plan : Closure Criteria

- Tritium Concentrations <20,000 pCi/L in Resident Farmer Well
  - 0.7 gpm From Highest Tritium Location
  - Use Aquifer Characterization Testing and Numerical Model Results
- Tritium Trends Acceptable
  - Resident Farmer Demonstration Not Affected
  - Down Gradient Offsite Wells <20,000 pCi/L
- Site Radionuclides (Excluding Tritium) Do Not Exceed Amendment No. 158 Limits

LTP Groundwater Monitoring Plan : 2006 Activities

- Perform Aquifer Characterization Test
  - Identify Hydraulic Connections Between Aquifers
  - Determine Hydrogeological Parameters
- Develop Fate and Transport Model
- Continue Sampling and Analysis
  - 5 Quarterly Samples (Includes Two Spring Seasons)
  - Consider Reducing Analyses for Certain Nuclides
- Demonstrate Yield and Radiological Water Quality of "Resident Farmer" Well

Fate and Transport Model: YNPS Groundwater Model

- Uses 3-D MODFLOW/MODPATH/MT3DMS
- Includes Large Area on Both Sides of River
- Assumes Finer Grid On and Near Site
- Assumes 15 Layers
  - Glaciofluvial(1)
  - Till (3 sand layers sandwiched between 4 till layers)
  - Glaciolacustrine (2 sand layers sandwiched between 3 Glaciolacustrine layers)
  - Upper bedrock
  - Lower Bedrock

Fate and Transport Model: Use of Model

- Match Pressure Transient Tests by Varying Continuity of Sand Lenses
  - Pressure Transient Tests June 2006
  - Pumping Test MW-107C June 2006
- Simulate Historical Rates of Tritium Movement
- Revise Conceptual Site Model
- Predict Fate and Transport of Tritium Plume

Fate and Transport Model: Data for Model Development

- Base Maps
  - 1997 Orthophotos; DEM10; YAEC land 5'-contour
  - 1974 10 foot bathymetric contour map of Reservoir
- Geology
  - Original borings and seismic
  - 1977-82 borings, testpits, mapping and seismic
  - 1993-2006 borings and monitoring wells
- Water levels
  - Approx. quarterly since 1993
  - Datalogger records 2003-2006

Fate and Transport Model: Data for Model Development

- Physical Tests on Soil
  - Seismic Refraction and Shear Wave Velocities
  - Tests on Undisturbed Till from 1977 Testpits
  - GeoTesting Express Soil Testing 2003
- Water Quality Data
  - Radiological (Particularly Tritium) from 1965 on
  - Boron 2003-2004; 2006
  - Anion/Cation Summer 2006

Fate and Transport Model: Model Calibration

- Match Avg Annual Historical Water Levels Under Plant Operating Conditions
- Match Vertical Groundwater Gradients
- Match Response to Rainfall
- Match Rate of Tritium Movement in Glacial Drift; Downward in Glacial Till
- Match Pressure Transient and Pumping Tests from 2006

Groundwater Closure Plan: Documentation of Results

- Mid-2006 Groundwater Report
  - Well Characteristics
  - Aquifer Characterization Results
- 2006 Groundwater Report
  - Numerical Model Results
  - Resident Farmer Demonstration
- 1Q 2007 Supplemental Report to Confirm LTP Criteria Met

Groundwater Closure Schedule

Quarterly Sampling	Ongoing
Monthly H-3 Sampling	Ongoing
Aquifer Characterization Test	June-July 2006
2Q 2006 Sampling Round	June-July 2006
2006 Interim Report	September 2006
3Q 2006 Sampling Round	September 2006
4Q 2006 Sampling Round	December 2006
2006 Groundwater Report	February 2007
1Q 2007 Sampling Round	March 2007
Summary Letter	April 2007
License Termination	July 2007