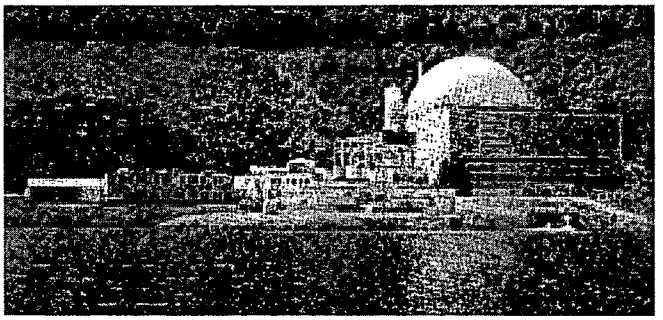
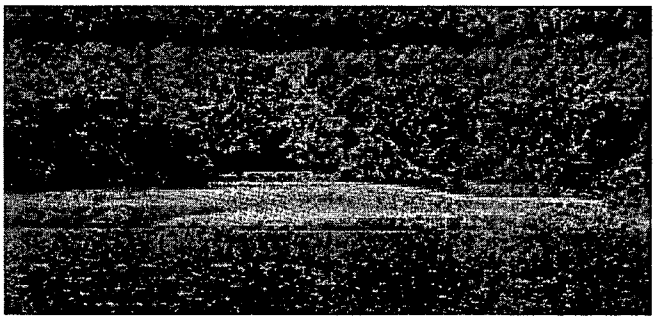
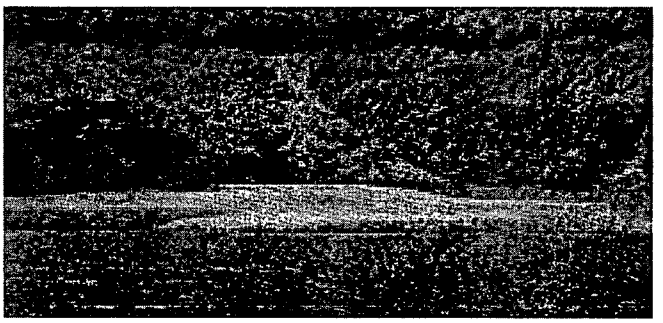
Site Closure Project Plan

Yankee Nuclear Power Station Site Closure Project







Yankee Nuclear Power Station • Rowe, Massachusetts

October 20, 2003 • Revision 1

Site Closure Project Plan

Yankee Nuclear Power Station
Site Closure Project

Yankee Nuclear Power Station
Rowe, Massachusetts

October 15, 2003 • Revision 1

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RICHARD M. KACICH
PRESIDENT

Dear Stakeholder:

Yankee Atomic Electric Company remains committed to the safe and complete decommissioning of the Yankee Nuclear Power Station and the restoration of the site for ultimate release for unrestricted use.

A key step in this process is compliance with all applicable environmental regulations. To that end, we have prepared this Site Closure Project Plan that describes our approach to achieving the necessary regulatory approvals and stakeholder support needed to restore the site and prepare it for reuse.

On behalf of Yankee Atomic Electric Company, I am pleased to present this copy of our Site Closure Project Plan for the Yankee Nuclear Power Station. I ask that you take the time to review this document and provide us with your questions, comments and suggestions.

We can best meet our objectives by listening to you and incorporating your thoughtful input and guidance into our work. It is my sincere belief that through this dialogue, we may best achieve site closure in a manner that meets our mutual interests.

Thank you for your interest in the decommissioning of the Yankee Nuclear Power Station. I look forward to working together towards the successful closure and release of the site.

Sincerely,

Richard M. Kacich

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ACOE	U.S. Army Corps of Engineers
ALARA	As Low As Reasonably Achievable
ALTA	American Land Title Association
ASTM	American Society of Testing and Materials
BUD	Beneficial Use Determination
CAAA	Corrective Action Alternatives Analysis
CAB	Community Advisory Board
D&D	Demolition & Disposal
DCGL	Derived Concentration Guideline Level
DEP	Massachusetts Department of Environmental Protection
DPH	Massachusetts Department of Public Health
EIR	Environmental Impact Report
ENF	Environmental Notification Form
EOEA	Massachusetts Executive Office of Environmental Affairs
EPA	U.S. Environmental Protection Agency
ERA	Ecological Risk Assessment
FGEIS	Final Generic Environmental Impact Statement
FSS	Final Status Survey
HSA	Historical Site Assessment
HASP	Health and Safety Plan
HHRA	Human Health Risk Assessment
ICM	Interim Corrective Measure
ISA	Initial Site Assessment
ISFSI	Independent Spent Fuel Storage Installation
LTP	License Termination Plan
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MCP	Massachusetts Contingency Plan (under 21E)
MEPA	Massachusetts Environmental Policy Act
NHESP	Massachusetts Natural Heritage & Endangered Species Program
NOI	Notice Of Intent
NPDES	National Pollutant Discharge Elimination System

NRC	U.S. Nuclear Regulatory Commission
OHM	Oil or Hazardous Materials
PCBs	Polychlorinated Biphenyls
US Gen NE	U.S. Generation New England
QAPP	Quality Assurance Project Plan
RAM Plan	Remedial Abatement Measure Plan
RCA	Radiologically Controlled Area
RCRA	Resource Conservation and Recovery Act
RFDA	Request For Determination of Applicability
RFI	Request For Information
SCFA	Southeast Construction Fill Area
TEDE	Total Effective Dose Equivalent
TSCA	Toxic Substances Control Act
YAEC	Yankee Atomic Electric Company
YNPS	Yankee Nuclear Power Station

SECTION 1

EXECUTIVE SUMMARY

The Yankee Nuclear Power Station (YNPS) encompasses approximately 12 acres developed for industrial use out of approximately 2,200 acres owned by Yankee Atomic Electric Company (YAEC). The YNPS power generating plant began operations in 1960 and operated safely and successfully for 31 years. In February 1992, the YAEC Board of Directors decided it was in the best economic interest of electric customers to cease operations permanently at YNPS and decommission the plant.

This Site Closure Project Plan describes the process by which YAEC will complete the decommissioning, environmental investigation, environmental remediation, site closure and post-closure property transfer of YNPS.

This Site Closure Project Plan (SCPP) describes the process by which YAEC will complete the decommissioning, environmental investigation, environmental remediation, site closure and post-closure property transfer of YNPS. YAEC's goals for the Site Closure Project are to:

- Substantially complete the majority of decommissioning and physical site closure activities at the site by mid-2005;
- Achieve radiological and non-radiological site closure in a safe, responsible, reliable and beneficial manner;
- Integrate stakeholder requirements and interests into the project planning and implementation process to optimize efficiency, avoid duplication of efforts and facilitate acceptance by both regulatory and non-regulatory stakeholders;
- Restore the site to environmental quality standards that will enable future unrestricted use of the site, where feasible; and
- Safely manage the spent nuclear fuel on site until such time that the Department of Energy satisfies its legal obligation to remove the fuel.

The SCPP was developed by YAEC, with the assistance and expertise of three environmental firms, CLF Ventures, Inc. (CLFV, a non-profit affiliate of the Conservation Law Foundation), Environmental Resources Management (ERM) and, Gradient Corporation (Gradient). The SCPP was developed to communicate the activities by which YAEC will complete the site closure process consistent with these goals. Radiation Safety & Control Services (RSCS) serves as the main consultant on License Termination Plan preparation and planning for site radiological assessment. The site closure process developed by YAEC and its team of subcontractors is depicted in Figure 2-3.

Section 2: Introduction

YAEC embarked upon the safe and effective decommissioning of the YNPS beginning in 1992. Through 2003, YAEC's efforts have been largely focused on satisfying its regulatory obligations to the NRC pertaining to safe possession of the facility and storage of spent nuclear fuel, decommissioning and decontamination of the plant, and eventual termination of the NRC operating license. These efforts will continue until YAEC has satisfied its NRC obligations and has ceased licensed activities on-site. Although YAEC may release portions of the site after it has demonstrated that NRC's radiological release criteria have been met, licensed activities related to storage of spent fuel will continue following plant decommissioning until the federal government establishes a repository to receive spent nuclear fuel and Greater Than Class C (GTCC) waste currently stored on-site in a dual-purpose dry storage/transport system.

Because the Department of Energy (DOE) did not meet its statutory and contractual obligation to begin removing the spent nuclear fuel and Greater Than Class C (GTCC) waste generated from the operation of YNPS as scheduled in January 1998, YAEC also needed to design and construct an Independent Spent Fuel Storage Installation (ISFSI) that uses dry cask storage to store and manage this spent fuel and GTCC. Removal of spent fuel from the pool and placement on the ISFSI pad was completed in June of 2003. It is not currently known when the United States Department of Energy (DOE) will be prepared to remove the spent fuel and GTCC waste from the site.

Key site closure activities accomplished to date are summarized in Table 2-1.

The NRC requires YAEC to prepare a License Termination Plan (LTP) which describes site conditions, planned decommissioning activities, site remediation activities and the final site survey plans to confirm the radiological safety of the decommissioned facility. As a central component to the decommissioning process, the LTP will provide YAEC's blueprint for completing the NRC decommissioning and license termination process.

At present, YAEC anticipates that the following activities will be undertaken as part of the YNPS Site Closure Project.

- Demolish all existing structures with the exception of the ISFSI and some administrative support buildings. The demolition debris will be disposed of at appropriate off-site disposal or recycling facilities;
- Perform permitting and compliance activities necessary to comply with all radiological and non-radiological regulatory programs applicable to site closure activities;
- Characterize site environmental conditions as necessary to meet all applicable regulatory needs and to ensure that significant stakeholder information needs about site closure activities and post-closure conditions are met;

- Conduct remediation of radiological and non-radiological releases as necessary to satisfy applicable regulatory requirements, including NRC (radiological) and DEP (non-radiological and radiological), and to support unrestricted future use of the property;
- Complete the facility decommissioning process; and
- Establish appropriate environmental end-state conditions and supporting docmentation, based on cleanup standards applicable to residential and unrestricted future use scenarios, to allow the property to be made available for and amenable to appropriate post-closure transfer. Current transfer options include making the land available for conservation or open space use.

By mid-2005, YAEC intends to substantially complete the majority of physical closure activities at the site. The major site closure activities currently planned by YAEC are summarized in Table 2-2.

Section 3: Stakeholder Communications and Outreach

The SCPP presents the goals, requirements and stakeholder interests addressed by the site closure process. Accordingly, the SCPP maps a prospective pathway to achieve closure of the site in 2005. The specific pathway to site closure will continue to be developed through YAEC's ongoing interaction with stakeholders to resolve uncertainties, confirm specific requirements and address stakeholder interests. To prepare the SCPP, YAEC and CLFV met with stakeholders, including the stakeholder groups identified in Section 2.5, to inform them about the site closure process and to identify specific stakeholder preferences and requirements. YAEC's plans for stakeholder involvement in site closure are presented in Section 2.5 and in Section 3.

The SCPP is intended to be a living document reflecting YAEC's plan for addressing aspects of the site closure process. It is intended to be a comprehensible blueprint of the site closure process prepared so that all stakeholders, including regulators, interested members of the public, and potential successor owners of the site may review and provide input to YAEC's plans for site closure and re-use. As information is further developed about site conditions and stakeholder interests during the site closure process, YAEC will update the SCPP and maintain it as an accurate and current description of intended site closure activities. YAEC has established a website (www.yankee.com) as a communication vehicle to assist in stakeholder outreach and to receive stakeholder comments and feedback regarding the project. As site closure proceeds, YAEC will maintain up-to-date information about the status of site activities on this web site, together with significant documentation available for stakeholder review.

Section 4: Site Definition

Section 4 of the SCPP describes several site definition tasks currently underway to further delineate the physical, ecological and cultural resources associated with the Site, as well as developing corresponding resource management plans. The site definition tasks include:

- Conducting an American Land Title Association (ALTA) survey to document the legal boundaries of the site using modern survey and geographical information systems techniques. Topographic maps of the property are being developed to support this effort.
- Conducting a natural resource inventory to delineate the ecological resources associated with the YNPS. This survey will take place over multiple seasons and will include the following tasks: Vegetation Survey, Wildlife Inventory, Endangered Species Analysis, Forest Health and Value Analysis, and Natural Resource Inventory and Management Plan.
- Undertaking a survey to delineate the site's archeological and cultural resources. This survey will be completed in accordance with guidelines developed by the Massachusetts Historical Commission.

Based on the results of these tasks, corresponding resource management plans will be developed.

Section 5: Regulatory and Permitting Context and Closure Plan

Section 5 presents the results of a comprehensive assessment, prepared by YAEC and its subcontractors, of the regulatory environment in which site closure will be conducted. This assessment reviewed regulatory requirements relevant to both the radiological and non-radiological environmental profile of the activities necessary to achieve site closure. Regulatory Compliance Plans were developed to define the measures to be taken to address these regulations. The results of the assessment are summarized in Figure 5-1, which provides the major site closure activities and the potentially applicable regulatory programs in matrix form. Required permits or submittals are identified within red cells of Figure 5-1 if the regulation is applicable to the site closure activity, or within yellow cells if more information is required to determine if the regulation is potentially applicable. This figure will be updated in future SCPP versions as information is developed to further define the regulatory status of the site closure activities.

As discussed in Section 5.2, the closure compliance pathway for regulatory programs specifically addressing radiological substances or impacts is well defined. The focal point of regulation of radiological aspects of site closure is the NRC license held by YAEC pursuant to Title 10 of the Code of Federal Regulations. In addition, Massachusetts

Department of Public Health (DPH) has established performance standards for radiologically remediated facilities. Consistent with its overall regulatory approach, YAEC intends to demonstrate compliance with both the NRC criteria and the DPH standards.

Because decommissioning and license termination of YNPS is a federal agency action, the NRC is required to assess the potential environmental impacts of this action under the National Environmental Policy Act (NEPA). NEPA requires the assessment of the environmental impacts of "federal actions" generally and does not distinguish between radiological and non-radiological regulatory contexts. Decommissioning activities, license termination activities and potentially other site-specific closure activities may have environmental impacts of concern. NRC prepared a Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities to assess the environmental impacts of decommissioning common to all nuclear facilities. Section 8 of the LTP is required by NRC regulations to evaluate the site-specific aspects of decommissioning to complete the environmental assessment of the NRC license termination and decommissioning process required by NEPA.

Some areas on the site are likely to have some residual radioactivity after YAEC completes the activities specified in its LTP. NRC regulations require that a site may not be released for unrestricted use, as YAEC intends, unless the residual radioactivity distinguishable from background radiation is less than 25 millirem per year (mrem/yr) total effective dose equivalent (TEDE). NRC regulations also require that residual radioactivity be reduced to levels that are as low as reasonably achievable (ALARA), a standard that requires achieving technologically feasible reductions in residual radioactivity. DPH's radiological site release criteria require achieving a level of residual radioactivity less than 10 mrem/yr.

> ***YAEC Radiological Regulatory Compliance Plan***: Pursuant to the LTP, YAEC will conduct the necessary remedial actions to achieve residual radioactivity levels that are below 25 mrem/yr and will also meet the ALARA requirements. YAEC will confirm compliance with this requirement through its Final Status Survey that will characterize site conditions and residual radioactivity levels after any necessary remediation is complete. YAEC will use the resident farmer scenario to assess the residual risks and will establish the target concentration and surface radioactivity limits to demonstrate compliance with the NRC residual radioactivity criteria for unrestricted use for the YNPS site. YAEC remedial actions will be sufficiently extensive to also comply with the DPH criterion of 10 mrem/yr. The method for demonstrating compliance with the DPH 10 mrem criterion will be described in a Workplan that will be available for stakeholder review and input.

On the state and local level, the major regulatory programs potentially applicable to YAEC's non-radiological site closure activities are the Massachusetts Environmental Policy Act (MEPA), the Wetland Protections Act (WPA), the Massachusetts Clean Waters Act (CWA), the Public Waterfronts Act (Chapter 91), the Massachusetts solid

waste management regulations and the Massachusetts Contingency Plan (MCP). The Non-radiological Regulatory Compliance Plan for these programs is described in Section 5.3.1. With respect to the requirements imposed by the federal Resource Conservation and Recovery Act (RCRA), Massachusetts is a delegated state with commensurate authority and regulations, 310 CMR 30, which are applicable to hazardous waste management activities at the site.

MEPA requirements may be triggered and the Executive Office of Environmental Affairs (EOEA) may be required to review the potential of site closure to damage the environment if one or more of the MEPA review thresholds are exceeded and one or more regulatory permits related to the threshold are required from a state agency. YAEC's review of the MEPA thresholds indicates that the activities affecting wetlands resources may exceed the Wetlands, Waterways, and Tidelands thresholds but that no other MEPA thresholds are likely to be exceeded.

The WPA regulates activities in wetland resource areas and associated Buffer Zones, which are defined as areas within 100 feet of a wetland resource area or within 200 feet of a river. Many of the activities relevant to the MEPA threshold also will require WPA compliance.

The CWA requires that a Section 401 Water Quality Certificate be issued for projects that have the potential to adversely impact surface water quality, specifically the sediment remediation activities which are likely to require sediment removal.

The Public Waterfront Act, Chapter 91 (310 CMR 9), requires that a license be issued for work within certain waterways. Preliminary discussions with the Massachusetts Department of Environmental Protection (DEP) indicate that Sherman Reservoir is subject to Chapter 91 regulations and that therefore a Chapter 91 permit will be required for sediment remediation.

The Solid Waste Regulations regulate the handling and disposal of solid waste. The Southeast Construction Fill Area (SCFA) is a construction debris landfill that occupies an approximately 1.2-acre portion of the site. The SCFA contains primarily native site soil (boulders and soil) removed from the footprint of the power plant during its construction, as well as minor amounts of plant construction debris. YAEC has determined that the most effective option for addressing the contents of the SCFA will be excavation and removal of the landfill, disposal of non-native debris off-site and re-use of native materials on-site for re-grading, each of which must be done in compliance with these regulations.

The MCP regulates the notification, investigation and cleanup of releases of oil or hazardous materials to the environment. Several discrete areas of lead, petroleum and PCB-containing paint chip contamination of soil and sediments have already been addressed by short-term MCP risk reduction measures (Immediate Response Actions,

Release Abatement Measures and Limited Removal Actions) completed to date or ongoing at the site. Phases I through III of the MCP investigation and remediation process that define the extent of impact and the need for and type of cleanup have also been completed. As a result of the release of paint chips containing PCBs into the environment, YAEC has been classified under the MCP as a Tier II site that is being overseen by a Licensed Site Professional (LSP).

YAEC's Non-radiological Regulatory Compliance Plan for these state and local regulatory programs is summarized in Table 1-1.

On the federal level, RCRA, the National Pollutant Discharge Elimination System (NPDES) program, the Toxic Substances Control Act (TSCA), the Federal Energy Regulatory Commission (FERC) requirements and Section 404 of the federal Clean Water Act (CWA) are the major regulatory programs applicable to YAEC's site closure activities. YAEC's Non-Radiological Regulatory Compliance Plan for these programs is described in Section 5.3.2.

RCRA applies to YAEC's current status as a Large Quantity Generator of hazardous waste and waste oil due to the volume of wastes generated during decommissioning, specifically the management of paint-chip waste containing PCBs. YAEC has obtained a waiver from DEP from the 90-day limit for storage of the PCB wastes and mixed wastes (i.e., wastes that are classified as radiological wastes and hazardous waste) during the course of site closure activities due to the unique nature of the waste streams and limited number of receiving facilities.

The facility has maintained an NPDES permit for the discharge of storm water, service water, and non-contact cooling water from the United States Environmental Protection Agency (EPA) and the State since the inception of the program. YAEC recently obtained approval for renewing the existing NPDES permit and amending it to allow for a one-time treatment and discharge of the cooling water from the spent fuel pool, for discharge of groundwater collected from construction dewatering activities during decommissioning and remedial activities, and for management of stormwater.

TSCA regulates the remediation of the release of PCB-containing materials with a total PCB concentration greater than or equal to 50 parts per million (ppm) total PCBs, which may encompass some of the sediments, soils and demolition material from the site closure.

FERC controls activities performed within the boundaries of the Sherman Dam hydroelectric facility. These activities must be addressed with respect to any sediment and structure removal or modification activities within the boundaries of the Sherman Dam hydroelectric facility.

The Army Corps of Engineers (ACOE) regulates impacts to wetland areas through Section 404 of the Clean Water Act (CWA), including any sediment and structure removal activities within Sherman Reservoir.

YAEC's Non-radiological Regulatory Compliance Plan for these federal regulatory programs is summarized in Table 1-2.

As described in Section 5.3.3, YAEC determined that some of the regulatory programs examined during its regulatory assessment are not triggered by site closure activities and will not require specific compliance measures. These include the Historical and Archeological Preservation regulations and the Massachusetts Natural Heritage & Endangered Species Program (NESP).

Section 6: Site Characterization

As described in Section 6 of the SCPP, YAEC's site closure activities will include a systematic site characterization effort to collect sufficient data to ensure comprehensive regulatory compliance, in both the radiological and non-radiological regulatory arenas, and to demonstrate that site closure activities meet risk and performance standards that may be required by regulators or sought by other stakeholders. To this end, YAEC is undertaking coordinated radiological and non-radiological site characterization efforts.

Environmental characterization data will be collected and used to evaluate radiological constituents in order to meet the requirements of the LTP and to support the Final Status Survey. Similarly, environmental characterization data will be collected and used to characterize non-radiological constituents at the site. The study areas addressed in site characterization activities are depicted on the site map attached as Figure 6-1 and described in Table 6-1.

The environmental characterization program will focus its characterization efforts on non-radiological constituents and will be conducted consistent with current DEP and EPA guidelines. It is expected that the radiological data collected to support the LTP and Final Status Survey will sufficiently characterize the site for both LTP purposes, and to support the site risk assessments and meet DEP and DPH guidelines concerning radiological constituents. The environmental characterization program will be coordinated with the LTP characterization efforts in order to take advantage of joint field sampling opportunities to the extent feasible.

Upon completion of field sampling efforts, site characterization reports will be prepared to document the results of the historical data usability analysis and to present newly collected and confirmed data to stakeholders. These site characterization reports are intended to compile all of the environmental data necessary to demonstrate compliance with applicable environmental regulatory programs. This compilation is also intended to provide or reference the environmental data relevant to property transfer due diligence requirements.

Section 7: Risk Assessments

Several of the regulatory programs of potential relevance or applicability to site closure require quantitative measurement and assessment of environmental risk posed by site conditions. Accordingly, YAEC will conduct a number of environmental risk assessments described in Section 7 of the SCPP, consistent with the requirements and guidelines of applicable radiological and non-radiological regulatory programs. Assessments of environmental risks will ensure that post-closure conditions will not exceed the level of risk appropriate to the expected future property use. In addition to meeting the regulatory requirements for evaluation of risk, the YNPS risk assessments are a critical component of planned stakeholder information and outreach and, in particular, will demonstrate due diligence to the potential future owner(s) of the property.

YAEC will target its risk assessments and remedial actions to meet a number of acceptable risk criteria required by NRC, DPH, EPA and DEP to ensure future unrestricted site use. Four site risk assessments will be conducted by YAEC to determine the actions necessary to meet these criteria:

- Radionuclide dose risks will be assessed in the LTP. The NRC-acceptable dose limit is 25 mrem/year above naturally occurring background radiation.
- Radionuclide dose risks will also be compared to the DPH-acceptable dose limit of 10 mrem/year above naturally occurring background radiation.
- Combined radionuclide and non-radionuclide cancer and non-cancer risk to human health will be assessed in the Human Health Risk Assessment under MCP guidance for Method 3 human health risk assessment procedures. A future residential use of the site is presumed under Method 3 guidelines to evaluate whether the resultant risk levels will allow unrestricted future site use. The acceptable cancer limit from combined radionuclide and non-radionuclides is, under the MCP, 1×10^{-5} (assessed as an increment above background), and the acceptable non-cancer limit is a Hazard Index of 1.
- Ecological site risks due to radiological and non-radiological constituents will be assessed in a one or two-stage Ecological Risk Assessment under DEP MCP guidance for Method 3 ecological risk assessment procedures. Generally, a Hazard Index of 1 for each potential ecological receptor is considered to be acceptable risk.

Section 8: Remediation Plan

Section 8 describes how YAEC will determine its plan for actions to remediate impacts at the site to address risks from both radiological and non-radiological constituents. YAEC will conduct all radiological restoration required by the LTP and the MCP. Restoration of impacts from non-radiological constituents presently known to be required will be conducted primarily following the requirements of the MCP. YAEC will conduct non-radiological site assessment and remedial response actions under the

oversight and authority of a Licensed Site Professional (LSP) who ensures compliance with MCP requirements and certifies cleanup.

The most significant environmental remediation project currently underway at the site involves cleanup of soil, wetlands and sediment contamination resulting from chips of PCB-containing paint used to coat building surfaces at the facility. This remediation is expected to consist of excavation, removal and off-site disposal of paint chips with PCBs found in the soils and sediments from Sherman Reservoir, adjacent shoreline areas and upland areas of contamination. The total volume of soil requiring remediation in these areas is currently estimated to be approximately 2,000 cubic yards, over an approximately one-acre area adjacent to the former power plant. Two sediment areas have been identified as requiring remediation to address the PCB-paint chip release. The total volume of sediment requiring remediation in these areas is estimated at approximately 550 cubic yards, over an area of approximately one-third of an acre.

YAEC will conduct its remediation of PCB in soil and sediment to achieve a remedial action objective of one ppm PCB in soil and sediment. Under the MCP, this cleanup level will restore the site to a condition of "No Significant Risk", meet MCP performance standards for a Permanent Solution for the site and be consistent with federal standards for cleanup under TSCA.

The need for, and type of, remediation for cleanup of other media or materials will be determined by the results of the site characterization activities described in Section 6 and the risk assessment results described in Section 7.

SECTION 2

INTRODUCTION

This Site Closure Project Plan (SCPP) describes the process by which Yankee Atomic Electric Company (YAEC) will complete the decommissioning, environmental remediation, site closure and post-closure property transfer of the Yankee Nuclear Power Station (YNPS) located in Rowe, Massachusetts. YAEC's goals for the Site Closure Project are to:

- Substantially complete the majority of decommissioning and physical site closure activities at the site by mid-2005;
- Achieve radiological and non-radiological site closure in a safe, responsible, reliable and beneficial manner;
- Integrate stakeholder requirements and interests into the project planning and implementation process to optimize efficiency, avoid duplication of efforts and facilitate acceptance by both regulatory and non-regulatory stakeholders;
- Restore the site to environmental quality standards that will enable future unrestricted use of the site, where feasible; and,
- Safely manage the spent nuclear fuel on site until such time that the Department of Energy satisfies its legal obligation to remove the spent fuel and GTCC waste.

The SCPP presents the current status of site closure activities and the manner by which YAEC intends to complete its closure activities consistent with these goals. Integral to the realization of YAEC's project goals is the development of an effective working relationship with the project's many stakeholders. To this end, YAEC has developed the SCPP as an important means to communicate to stakeholders the many inter-related aspects of the closure project. The SCPP presents the goals, requirements and interests to be addressed by the site closure process and maps the prospective pathway, as currently intended by YAEC, to achieve closure of the site in 2005. The pathway will be developed through YAEC's ongoing interaction with stakeholders to resolve uncertainties, confirm specific requirements and address stakeholder interests.

The SCPP is intended to be a living document that will be periodically updated throughout the course of the closure project and available on the YAEC website, www.yankee.com. The introductory section of each successive version of the SCPP will describe the

current status of site closure activities and summarize accomplishments and developments since publication of the prior SCPP version.

YAEC welcomes your review and comments on each version of the SCPP and on any aspect of the site closure process and invites your participation in the successful completion of the YNPS closure project. Please address comments regarding the SCPP or other aspects of the Site Closure Project to any of the following individuals:

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2.1: Site Description

2.1.1 — PHYSICAL AND ENVIRONMENTAL SETTING

The Yankee Nuclear Power Station (YNPS) plant site encompasses approximately 12 acres developed for industrial use out of approximately 2,200 acres of undeveloped woodland owned by Yankee Atomic Electric Company (YAEC). The site is located in the northwestern Massachusetts Town of Rowe, on the southern Vermont border. The YNPS site abuts the eastern shore of the Deerfield River, adjacent to Sherman Dam, one of several dams along the Deerfield River used for hydroelectric power generation. Sherman Reservoir, the impoundment behind the dam, was used as the source of cooling water during plant operation. Sherman Reservoir is approximately two miles long, one-quarter of a mile wide and up to 75 feet deep along the former river channel. The YNPS plant is situated on a portion of a river terrace, which is recessed into, and largely surrounded by, steep-sided slopes of the Deerfield River Valley. In the vicinity of the plant, the sides of the river valley rise to over 1,000 feet above the river elevation, creating a deep narrow valley approximately two miles wide. The northern portion of the Deerfield River Valley is unique in Massachusetts for this topography, a product of alpine-type glacial erosion. See Figure 2-1, Site Location map.

2.1.2 — HISTORY OF PLANT OPERATIONS

The YNPS power generating plant achieved initial criticality in 1960 and began commercial operations in 1961. Originally the station was designed as a 145 MW plant and later increased to 185 MW. The YNPS operated safely and successfully for 31 years. In February 1992, the YAEC Board of Directors decided to cease power operations

permanently at YNPS and decommission the facility based upon economic analysis indicating that shutdown of the plant was in the best economic interest of electric customers. In December 1993, YAEC submitted the YNPS Decommissioning Plan to the Nuclear Regulatory Commission (NRC) in accordance with the requirements of 10 CFR 50.82(a) in place at the time. The Decommissioning Plan was approved on February 14, 1995 and, due to subsequent litigation, was re-approved on October 28, 1995.

2.2: Site Closure Activities To Date

2.2.1 — DECOMMISSIONING ACTIVITIES TO DATE

YAEC embarked upon the safe and effective decommissioning of the YNPS beginning in 1992. Through 2003, YAEC's efforts have been largely focused on satisfying its regulatory obligations to the NRC pertaining to safe possession of the facility and storage of spent nuclear fuel, decommissioning and decontamination of the plant, and eventual termination of the NRC operating license. These efforts will continue until YAEC has satisfied its NRC obligations and has ceased licensed activities on-site. Although YAEC may release portions of the site after it has demonstrated that NRC's radiological release criteria have been met, licensed activities related to ISFSI dry cask storage of spent fuel and GTCC waste will continue following plant decommissioning until the federal government establishes a repository to receive spent nuclear fuel and Greater Than Class C (GTCC) waste. It is not known when the United States Department of Energy (DOE) will meet its obligation to remove the spent fuel and GTCC waste from the site.

In May 1997, YAEC submitted a License Termination Plan (LTP) to the NRC identifying the remaining decommissioning work and the actions necessary to comply with NRC license termination requirements. Initial LTP activities were based upon the NRC guidance that was in effect at the time for conducting site radiological surveys. Changes in NRC guidance prompted YAEC to withdraw the 1997 LTP and prepare a new LTP to conform to this new guidance, the "Multi-Agency Radiation Survey and Site Investigation Manual", NUREG-1575, Reference 1-9 (MARSSIM). The new LTP will provide YAEC's blueprint for satisfying the NRC requirements for license termination.

In the phases of decommissioning accomplished to date, major plant systems and components were removed from site buildings. Systems and components removed include the steam generators, reactor vessel, and reactor coolant piping, as well as the turbines, generator and other plant systems not serving spent fuel pool support functions. Since 1993, removal of plant components includes more than 21 miles of piping and tubing, 33 miles of conduit and cable tray, thousands of valves, and pipe hangers, hundreds of pumps, and other related materials. In addition, six large components, including the reactor vessel, weighing a total of more than 500 tons were also removed. Low-level radioactive waste was sent to the Barnwell, South Carolina low-level radioactive waste disposal facility for permanent disposal.

2.2.2 — SPENT FUEL STORAGE ACTIVITIES TO DATE

YAEC constructed an Independent Spent Fuel Storage Installation (ISFSI) adjacent to the plant that utilizes an NRC-licensed dual-purpose (storage and transport) canister system for storage of spent nuclear fuel and GTCC waste generated from the operation of the YNPS. In June 2003, YAEC's contractor, NAC International, completed the removal and transfer of spent fuel and GTCC waste from the spent fuel pool to the specially designed dry storage casks. YAEC anticipates that the ISFSI installation and associated structures will remain on the site until the DOE meets its statutory and contractual obligation to take possession of the spent fuel and GTCC waste and transport it off site for storage and/or disposal.

2.2.3 — ENVIRONMENTAL CLOSURE ACTIVITIES TO DATE

Environmental studies, surveys and reports have documented radiological and non-radiological constituents in environmental media (soil, sediment, water, etc.) and on building surfaces at YNPS. Environmental characterization efforts from 1992 until 1997 focused primarily on radiological constituents. During this time-period, some initial sampling for volatile organic compounds, petroleum, and metals in groundwater was performed. The purpose for conducting these early sampling efforts was to characterize conditions as necessary to proceed with decommissioning. Beginning in 1997, an ongoing program was initiated to characterize environmental conditions for non-radiological constituents in soil, groundwater, the stormwater system, and Sherman Reservoir sediments.

Investigation and remediation to address a release of PCB-containing paint chips to soil and sediment have been underway in accordance with Massachusetts Contingency Plan (MCP) requirements since 2000. The site was classified as Tier II based on the results of a Phase I Initial Site Investigation and Tier Classification, which were submitted to the Massachusetts Department of Environmental Protection (DEP) in April 2001. A Phase II Comprehensive Site Assessment and Phase III Remedial Action Plan were submitted to DEP in April 2002. A Release Abatement Measure is currently in effect to allow for the maintenance of catch basins filters and the management of PCB-impacted soils during decommissioning.

Characterization of potential impacts to the environment associated with the Southeast Construction Fill Area (SCFA), a former construction debris fill area, has been underway since 1999. An Initial Site Assessment and Comprehensive Site Assessment were completed in 2001. Annual groundwater, surface water, and soil gas sampling is performed around the SCFA.

Underground storage tanks that had been used to store fuel oils, gasoline, and waste oil were removed from the site between 1989 and 1994. No signs of impact were observed during the tank removals.

Key site closure activities accomplished to date are summarized in Table 2-1.

2.3: Planned Site Closure Activities

At present, YAEC anticipates that the following activities will be undertaken as part of the YNPS Site Closure Project. As the project matures, regular updates on these tasks will be forthcoming.

- Demolish all existing above ground structures with the exception of the ISFSI and related support structures;
- Perform permitting and compliance activities necessary to comply with all regulatory programs applicable to site closure activities;
- Characterize site environmental conditions with sufficient thoroughness to meet all applicable regulatory needs and to ensure that significant stakeholder information needs about site closure activities and post-closure conditions are met;
- Conduct remediation of radiological and non-radiological releases as necessary to satisfy applicable and relevant regulatory requirements, including NRC (radiological) and DEP (non-radiological and radiological), and to support unrestricted future use of the property;
- Complete the facility decommissioning process and terminate the NRC license; and
- Establish appropriate environmental end-state conditions and supporting documentation, based on cleanup standards applicable to residential and unrestricted future use scenarios, to allow the property to be made available for and amenable to appropriate post-closure transfer.

YAEC and its subcontractors are currently conducting Phase I of its structure demolition program, involving the demolition of all above ground site structures, other than structures on the shoreline, to grade and disposal of resultant demolition debris. Demolition debris will be removed and disposed in an appropriate licensed disposal facility. The Vapor Container (including all interior structures) is being dismantled, removed from the plant site and disposed of off-site as radioactive waste. Phase II of the structure demolition program will include the dismantling and potential off-site disposal of remaining structures and facilities at or near grade as well as those structures and facilities adjacent to and in the subsurface of Sherman Reservoir dependent upon regulatory requirements. Accompanying the removal of shoreline structures, YAEC will characterize and remediate, as necessary, impacted soil and sediment. YAEC will re-use acceptable landfill soil to re-grade the site.

YAEC intends to substantially complete a majority of site closure activities by mid-2005. The major site closure activities currently planned by YAEC are summarized in Table 2-2.

2.4: Future Property Use

YAEC expects the process of decommissioning to focus primarily on the approximately 12 acres of the industrial site used for power generation. The remaining 2,200 acres of forested land that have not been utilized for industrial purposes will be characterized to document environmental conditions and to confirm that there have been no adverse impacts from industrial operations.

YAEC will be developing a plan for the ultimate release of all YNPS property. At this time it is envisioned that all areas outside of the industrial zone may be released for conservation or open space to either local, state, or federal governmental or non-profit entities. As a short term measure, the industrial zone and a portion of the property immediately adjacent may remain under YAEC control until such time that the spent fuel is removed from the site and the ISFSI facility is decommissioned, at which time YAEC expects that the remaining industrial area will be released for unrestricted use. YAEC expects that the 2,200-acre forested non-industrial portion of the site will achieve unrestricted status under the NRC regulations and residential use status under the MCP and may be released for conservation uses upon the conclusion of the LTP and MCP processes. After the ISFSI is decommissioned, YAEC anticipates that the industrial portion of the site will also be devoted to similar uses.

2.5: Development of Site Closure Project Plan

Accomplishing the foregoing site closure goals and activities will require the coordination of radiological and non-radiological closure efforts, demolition activities, and spent fuel storage management activities with numerous local, state and federal regulatory and permitting authorities, together with the interests and concerns of existing and adjacent land owners and residents. In addition, the site closure plans will be based upon consideration of the interests and concerns of the general public and a variety of other public and environmental stakeholders. Successful coordination of the necessary activities and integration of stakeholder interests will allow for a safe, reliable and timely completion to the site closure process and timely release of the site property for unrestricted use. The interactions among these components of site closure are depicted in Figure 2-2.

The SCPP was developed as a management and communication tool. The SCPP presents the current status of YAEC closure activities and the planned prospective activities by which YAEC intends to complete the site closure process consistent with the project goals. To develop the SCPP, YNPS contracted with three environmental firms, Conservation Law Foundation (CLFV, a non-profit affiliate of the Conservation Law Foundation), Environmental Resources Management (ERM) and Gradient Corporation (Gradient), to develop a site closure process that integrated the non-radiological site closure activities with the NRC decommissioning and license termination activities already underway in the radiological arena. The site closure process developed by YAEC and its team of subcontractors is depicted in Figure 2-3.

From the outset, YAEC and CLFV reached out to stakeholders to inform them about the site closure process and to identify specific stakeholder preferences and requirements concerning YAEC's pursuit of site closure. During the Initial Stakeholder Outreach effort, discussions were held with the following stakeholders:

- U.S. Environmental Protection Agency (EPA), Region I
- Massachusetts Attorney General's Office
- Massachusetts Executive Office of Environmental Affairs (EOEA)
- Franklin Regional Council of Governments
- Yankee Rowe Community Advisory Board (CAB)
- U.S. Generation New England (US Gen NE)
- Massachusetts Department of Environmental Protection (DEP)
- U.S. Nuclear Regulatory Commission (NRC)
- Massachusetts Department of Public Health (DPH)
- Franklin Regional Council of Governments – Planning Board
- Town of Rowe
- Elected Officials

In an effort parallel to stakeholder education and outreach, and in an attempt to determine the regulatory context for site closure, YAEC, CLFV and ERM performed an assessment of the potentially relevant environmental regulatory requirements that could apply to the site closure. This assessment identified a number of local, state and federal regulatory programs that would need to be addressed. A primary objective of the site closure project is to meet these regulatory objectives while working to satisfy stakeholder issues.

The efforts of YAEC's initial stakeholder outreach and regulatory assessments indicated a well-defined process (administered primarily by the NRC and DPH) for site closure actions associated with the characterization and abatement of radiological impacts to buildings, structures and environmental media, waste management and the procedures to verify regulatory compliance. In contrast, site closure activities for the remediation of impacts to buildings, structures and environmental media from non-radiological hazardous and non-hazardous materials were determined to be subject, or potentially subject to, the requirements, permits and approvals of numerous local, state and federal regulatory agencies. In both circumstances, activities require various levels of public involvement.

The SCPP outlines how YAEC site closure activities will address radiological and non-radiological closure requirements and how those activities will be integrated, where appropriate. Both processes and plans are inter-related and are being followed under coordinated, parallel tracks in an effort to optimize efficiency, avoid duplication of efforts and facilitate final acceptance by both regulatory and non-regulatory stakeholders.

2.6: SCPP Overview

The remainder of the SCPP consists of the following sections:

- Section 3 of the SCPP describes the project's stakeholder information and outreach efforts and the importance of stakeholder participation in the project.
- Section 4 outlines the various tasks YAEC will undertake to delineate the site's physical, ecological and cultural resources.
- Section 5 identifies the regulatory context in which site closure is to be conducted and YAEC's proposed approach to meet the applicable and relevant regulatory and permitting requirements.
- Section 6 describes the current state of site environmental data and YAEC's approach to site characterization in order to meet the regulatory and stakeholder data needs in a coordinated fashion.
- Section 7 describes YAEC's approaches to evaluating radiological and non-radiological regulatory environmental, public health and ecological risks that may be posed by site conditions and presents YAEC's plan for evaluating and demonstrating satisfaction of the relevant standards and requirements to achieve residential-appropriate risk levels and unrestricted site release.
- Section 8 presents YAEC's plan for addressing presently anticipated environmental remediation activities during site closure and the process for incorporating additional environmental remediation needs that may be identified during site characterization and other site closure project activities.

The SCPP is not intended to address routine building demolition issues, such as management of asbestos containing materials consistent with Clean Air Act[1] requirements, paint containing lead, PCB-containing light ballasts, or mercury-containing light bulbs. These routine disposal and recycling activities are being performed in accordance with YNPS operating procedures and in accordance with applicable local, state, and federal regulatory requirements. These actions will be documented in a site demolition summary report.

1 Massachusetts is a delegated state with respect to the federal Clean Air Act, with commensurate authority and regulations, 310 CMR 7.

SECTION 3

STAKEHOLDER COMMUNICATION AND OUTREACH

3.1: Role of Site Closure Project Plan in Stakeholder Communication

YAEC is committed to open and constructive dialogue with all stakeholders throughout the Site Closure Project. At the center of this commitment is the SCPP. The SCPP will provide a current description of the project scope and objectives and provide a vehicle to communicate project progress. The SCPP is intended to be a living document reflecting YAEC's plan and process for addressing aspects of the site closure process. It is intended to be a comprehensible blueprint of the site closure process so that all stakeholders, including regulators, interested members of the public, and potential transferees of the site may review and provide input to YAEC's plans for site closure and re-use.

As information is developed about site conditions and stakeholder concerns during the site closure process, YAEC will update the SCPP and maintain it as an accurate and current description of intended site closure activities. A condensed overview of the SCPP will serve as briefing materials for discussions with stakeholders and regulators.

3.2: World Wide Web (WWW)

YAEC has an established website (www.yankee.com) as a communication vehicle to assist in stakeholder outreach and to receive stakeholder comments and feedback regarding the project. In conjunction with the release of this SCPP, YAEC will update the website to include the SCPP, to inform stakeholders of the status and activities of the site closure process and to serve as a vehicle to receive stakeholder comments and provide feedback regarding the project.

3.3: Public Information Document Repository

In concert with sharing information electronically through its website, YAEC will create a public information document repository. The center will contain all relevant project information and will be housed in a publicly accessible venue to assist in stakeholder information and outreach. As this facet of the project is refined, updates about the contents and access procedures for the document repository will be included in the SCPP and on the website.

3.4: Public Meetings

One of the most important and beneficial aspects of stakeholder information and outreach are public meetings during which YAEC and its stakeholders may engage in dialogue regarding the various aspects of the Site Closure Project. As the Site Closure Project proceeds, YAEC expects to provide ongoing presentations and engage in a dialogue with the Yankee Rowe Community Advisory Board (CAB). The CAB has been the primary vehicle for public interaction for the past five years regarding YNPS activities. All CAB meetings are publicly noticed and are open to the public. Meeting minutes are published on YAEC's website. In addition, YAEC will be available to meet with other stakeholder and community groups if requested. YAEC also envisions that its various permitting and environmental assessment activities will provide opportunities for public meetings to involve its stakeholders.

SECTION 4

SITE DEFINITION

YAEC is conducting site definition tasks focused on delineating the physical, ecological and cultural resources at the Site. Upon completion of these specific tasks, site data will be incorporated into a Geographic Information System (GIS) to further assist YAEC and stakeholders with statistical and graphical data management.

4.1: American Land Title Association (ALTA) Survey

YAEC is presently conducting an American Land Title Association (ALTA) survey to document the legal boundaries, as well as developing corresponding resource management plans for the site. The ALTA survey is being conducted by a surveying firm licensed in the Commonwealth of Massachusetts. In addition, topographic maps of the property are being developed to support this effort.

4.2: Natural Resource Inventory

YAEC is conducting a natural resource inventory to delineate the ecological resources associated with the YNPS. This survey will take place over multiple seasons.

4.2.1 — VEGETATION SURVEY

Field data collection on the property's vegetation composition and habitat types will be developed to determine the relationships between different woodland types and vegetative zones. Information will be developed on soils, hydrology, geology, wetlands delineation, vegetation and habitat types. Site-specific data will be supplemented with published data available from the State of Massachusetts including aerial photography, soil survey data, geology and topographic mapping.

4.2.2 — WILDLIFE HABITAT INVENTORY

This task will include a determination of both the presence and availability of habitat type, mast crops (nuts and berries), forage types, water availability and denning and nesting sites. This data will provide information on the presence of and potential for wildlife species to inhabit various habitat types.

4.2.3 — ENDANGERED SPECIES ANALYSIS

YAEC has requested the National Heritage and Endangered Species Program of the Commonwealth of Massachusetts and the United States Fish and Wildlife Service to

document any known or suspected rare and endangered species associated with YAEC's property. The site is located within Priority/Estimated Habitat, which has been delineated for the Bald Eagle. Based on this information and on the vegetative survey and wildlife habitat inventory, a recommendation will be made regarding the applicability of endangered species determination under the Massachusetts Environmental Policy Act (MEPA). The fieldwork component of the Natural Resources Inventory will also investigate the presence of rare or endangered species.

4.2.4 — FOREST HEALTH AND VALUE

A determination and documentation of forest health as it relates to past and present pest infestations and disease and their impact on forest ecology will be included as will an estimate of the economic value of timber on the property.

4.2.5 — NATURAL RESOURCE INVENTORY AND MANAGEMENT PLAN

Based on the above data gathering efforts, a Natural Resource Inventory and Management Plan will be prepared to delineate any specific natural resource management obligations necessary to preserve the Site for conservation and for the long-term stewardship of the site's natural resources. This plan will be posted on the Yankee website and placed in the information repository.

4.3: Archeological and Cultural Resource Survey

In concert with developing a thorough understanding of the site's natural resources, YAEC will also undertake a survey to delineate the site's archeological and cultural resources. This survey will be completed in accordance with guidelines developed by the Massachusetts Historical Commission. The survey will promote development of a management plan to effectively manage these resources.

The archeological and cultural resource survey is expected to be completed in early 2004. The survey results will be published as an Archeological and Cultural Resource Inventory and Management Plan, a copy of which will be posted on the Yankee website and placed in the information repository.

SECTION 5

REGULATORY AND PERMITTING CONTEXT AND CLOSURE PLAN

5.1: Results of Regulatory Assessment

To develop the SCPP, YAEC conducted a comprehensive assessment of the regulatory environment in which site closure will be conducted. This assessment addressed regulatory requirements relevant to the activities necessary to achieve site closure, for both the radiological and non-radiological environmental profile. The regulatory programs that may apply to the site closure process are summarized in Figure 5-1 as a matrix listing the major site closure activities across the top and the potentially applicable regulatory programs down the side. Cells in Figure 5-1 are color-coded to indicate YAEC's current expectation of the applicability of a regulation to each site closure activity currently.

Red	Permit or submittal expected to be required.
Yellow	More information required to determine whether a permit or submittal will be required.
Green	Regulatory program not expected to be applicable to the activity.

Required permits or submittals are identified within each red and yellow cell when a regulation is triggered or potentially applicable. This figure will be updated in future SCPP revisions as information is developed which clarifies the regulatory status.

YAEC has structured the environmental site closure activities to comply in a coordinated way with the requirements of the applicable regulatory programs. In this way, YAEC intends to anticipate to the fullest extent possible the needs and requirements of regulatory stakeholders with significant interests in its site closure activities. This approach is also to provide to stakeholders, including potential post-closure transferees of the property, a high level of confidence that regulatory health, safety and environmental standards will be satisfied by closure activities. This will also help to minimize the possibility of "going back to square one" to address unanticipated compliance needs when the applicability of a regulatory program is clarified during the site closure process.

The remainder of this chapter identifies the regulatory programs which YAEC has determined are or may be applicable or relevant to presently contemplated site closure activities. The provisions relevant to the activities are described briefly, together with YAEC's plan for addressing the regulatory concerns of each relevant regulatory program.

5.2: Radiological Regulatory Compliance Plan

The compliance pathway for regulatory programs specifically addressing radiological substances or impacts is well defined. The focal point of regulation of radiological aspects of site closure is the NRC license held by YAEC pursuant to Title 10 of the Code of Federal Regulations. YAEC will follow the process prescribed by the NRC to decommission the facility, release the site and terminate the NRC license and will involve stakeholders in the decommissioning and license termination decision process. In addition, DPH has established performance standards for closure of radiological facilities that, in some respects, differ from the NRC license and regulatory requirements.

YAEC Plan: Consistent with its overall regulatory approach, YAEC intends to demonstrate compliance with both the NRC criteria and with the DPH standards.

5.2.1 — NUCLEAR REGULATORY COMMISSION REGULATIONS

One of the objectives for decommissioning the YNPS site is to reduce residual radioactivity to levels that permit release of the site for unrestricted use and for termination of the NRC license, in accordance with the Commission's site release criteria set forth in 10 CFR 20, Subpart E. To accomplish this objective, YAEC will develop a License Termination Plan (LTP) that satisfies the requirements of 10 CFR 50.82, "Termination of License" (Reference 1-1) using the guidance provided in Regulatory Guide 1.179, "Standard Format and Content of License Termination Plans for Nuclear Power Reactors" (Reference 1-2). The LTP must describe the site characterization, the remaining decommissioning activities that will be performed, any remediation that may be necessary to meet unrestricted use cleanup criteria and the process for performing the Final Status Survey.

Some areas of the plant site are likely to have some residual radioactivity after YAEC completes the activities specified in its LTP. Site characterization to support LTP preparation is ongoing. NRC regulations require that a site may not be released for unrestricted use, as YAEC intends, unless the residual radioactivity distinguishable from background radiation is less than 25 millirem per year (mrem/yr) total effective dose equivalent. NRC regulations also require that residual radioactivity be reduced to levels that are as low as reasonably achievable (ALARA), a standard that evaluates the cost/benefit of implementing technologically feasible alternatives to further reduction in residual radioactivity.

YAEC Plan: YAEC will develop and submit an LTP[2] based upon current regulatory guidance related to license termination and radiological decommissioning to the NRC for approval and for public review and comment in November 2003. YAEC will use the NRC's hypothetical resident farmer scenario to assess the residual risks from exposure to site soils and concrete. YAEC will use the

2 YAEC previously submitted a draft LTP and subsequently withdrew the submittal in order to incorporate a new federally developed and approved program for conducting final status surveys.

building occupancy scenario to assess the residual risks from exposure to surficial contamination in structures. YAEC will establish the target concentration and surface radioactivity limits that will be the basis for demonstrating achievement of the NRC residual radioactivity criteria for unrestricted use for the YNPS site. Pursuant to the LTP, YAEC will conduct the necessary remedial actions to ensure that residual radioactivity levels are reduced below 25 mrem/yr and will also meet the ALARA requirements. YAEC will confirm compliance with these requirements through its Final Status Survey that will document site conditions and residual radioactivity levels after any necessary remediation is complete.

5.2.2 — MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH REGULATIONS

The DPH's radiological site release criteria require achieving a level of residual radioactivity less than 10 mrem/yr.

YAEC Plan: YAEC remedial actions will be sufficiently extensive to comply with the DPH criterion of 10 mrem/yr. YAEC will utilize the processes, technical procedures, and data collected as part of the Final Site Status Survey, performed in accordance with the LTP, to demonstrate compliance. YAEC will develop a Workplan describing its methods for evaluating compliance with 10 mrem/yr. This Workplan will be reviewed by appropriate stakeholders, to incorporate stakeholder input in the process.

5.2.3 — NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) REGULATIONS

Because decommissioning and license termination of YNPS is a federal agency action, the NRC is required to assess the potential environmental impacts of this action under the National Environmental Policy Act (NEPA). NRC has previously prepared a Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities to assess the environmental impacts of decommissioning common to all nuclear facilities. See Supplement 1 to NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities (FGEIS)" (Reference 1–10). In addition, Section 8 of the LTP is required by NRC regulations to evaluate the site-specific aspects of license termination activities and end-use of the site to determine whether there are any new and significant site-specific impacts from those impacts previously considered with respect to decommissioning. In accordance with NRC regulations, the NRC will be required to complete an environmental assessment of NRC license termination under its process established to meet NEPA.

YAEC Plan: YAEC will provide the environmental information required by the NRC in connection with license termination in Section 8 of the LTP.

5.3: Non-Radiological Regulatory Compliance Plan

The compliance pathway for site closure activities in relation to non-radiological environmental regulatory programs is less distinct and potentially more complex than the

compliance pathway for radiological regulatory site closure activities. The following site closure activities may require YAEC to obtain local, state or federal permits and/or regulatory approvals beyond those required for radiological regulatory compliance:

- Building demolition within or bordering wetland resource areas;
- Removal of shoreline structures bordering Sherman Reservoir near Sherman Dam;
- Closure of the Southeast Construction Fill Area;
- Remediation of PCB-containing sediment in Sherman Reservoir and the west storm drainage swale;
- Remediation of PCB-containing soil;
- Discharge of storm water, construction dewatering within remaining structures and non-contact cooling waters;
- Possible remediation of soil, sediment or groundwater;
- Closure of hazardous waste accumulation and storage areas; and
- Property transfer.

Section 5.3 presents the regulatory compliance plan for non-radiological regulatory programs that may be relevant to these presently contemplated site closure activities or to other historical site activities.

5.3.1 — REGULATORY COMPLIANCE PLAN – POTENTIALLY APPLICABLE LOCAL AND STATE REGULATORY PROGRAM

Based on the activities identified above, YAEC has determined that the local and state regulatory programs discussed in the following subsections are potentially applicable to the presently contemplated site closure activities.

5.3.1.1 Massachusetts Environmental Policy Act (MEPA)

The Executive Office of Environmental Affairs (EOEA) implements the Massachusetts Environmental Policy Act (MEPA), which requires a review of projects that have the potential to damage the environment. An Environmental Notification Form (ENF) and/or Environmental Impact Report (EIR) is required if one or more of the MEPA review thresholds is exceeded and one or more regulatory permits related to the threshold are required from a state agency. Based on a review of the MEPA thresholds, the extent of activities affecting wetlands resources may exceed the Wetlands, Waterways, and Tidelands thresholds for an ENF but no other MEPA thresholds are likely to be exceeded.

YAEC Plan: YAEC will use results from its site characterization activities ongoing in 2003 to quantify the extent its closure activities will affect wetlands resources to

determine whether the Wetlands, Waterways and Tidelands triggers will be exceeded. YAEC will assess whether any MEPA review that may be required or appropriate could be productively consolidated with other environmental review procedures that may be required by other agencies such as the Federal Energy Regulatory Commission (FERC) or the Army Corps of Engineers (ACOE). YAEC intends to request a pre-application meeting with EOEA once the MEPA evaluation is completed to identify the most effective means for conducting any resultant environmental review.

5.3.1.2 Wetlands Protection Act

The Wetland Protection Act (WPA) regulates activities in wetland resource areas and associated Buffer Zones, which are defined as areas within 100 feet of a wetland resource area or within 200 feet of a river. YAEC has completed an initial round of wetlands delineation and is in the process of refining the details of the delineation and mapping the results. YAEC submitted a Request for Determination of Applicability to the Town of Rowe Conservation Commission in May 2003 to confirm that the phase of structure demolition activities scheduled to begin in July 2003 (Phase I) would be conducted outside of the wetland resource areas and were not subject to the requirements of Wetlands Protection Act. The Town of Rowe Conservation Commission issued a Negative Determination of applicability on July 16, 2003, confirming that the Phase I demolition activities will not require a Notice of Intent under the WPA. Phase II structure demolition activities, which include removal of shoreline installations and potentially structures within Sherman Reservoir, sediment remediation activities as well as removal of the Southeast Construction Fill Area (SCFA) will involve work within wetland resource areas.

YAEC Plan: YAEC will submit a Notice of Intent (NOI) in advance of Phase II decommissioning activities (i.e., removal of shoreline structures and sediment) that are expected to occur within wetland resource areas.

5.3.1.3 Massachusetts Clean Waters Act

The Massachusetts Clean Waters Act requires that a Section 401 Water Quality Certificate be issued for projects that have the potential to adversely impact surface water quality. The applicant is required to provide reasonable assurance that the work will be conducted in a manner that will not violate applicable surface water quality standards (314 CMR 4). MEPA approval is required prior to the issuance of a Section 401 Water Quality Certificate.

YAEC Plan: YAEC will file an application for a Section 401 Water Quality Certificate concerning the anticipated remediation of sediment in Sherman Reservoir and removal of shoreline structures.

5.3.1.4 Public Waterfront Act – Chapter 91

The Massachusetts Public Waterfront Act (Chapter 91) requires that a license or permit be obtained for projects in tideland, Great Ponds (over 10 acres in a natural state), and

certain rivers and streams. The regulations are intended to ensure that public rights to fish and navigate are not unreasonably restricted and that unsafe or hazardous structures are repaired or removed. MEPA approval and a Notice of Intent are required prior to the issuance of a Chapter 91 permit.

YAEC Plan: YAEC will confirm the applicability of Chapter 91 to the Site Closure Project and, if required, file an application for a Chapter 91 permit.

5.3.1.5 Solid Waste Regulations

The Massachusetts Solid Waste Regulations regulate the handling and disposal of solid waste. The SCFA is a former construction debris landfill that occupies an approximately 1.2-acre portion of the site that contains primarily native site soil (boulders and soil) removed from the footprint of the power plant during its construction. However, the presence of some non-native construction debris in the SCFA triggers the need for closure of the SCFA consistent with the Massachusetts Solid Waste Regulations. YAEC prepared an Initial Site Assessment (ISA), dated March 10, 2000, a Comprehensive Site Assessment (CSA), dated September 14, 2001, and has performed annual monitoring of groundwater, surface water and soil gas in the SCFA area. Based on these assessments, YAEC has determined that the most effective option for addressing the contents of the SCFA will be excavation and removal of the landfill, disposal of non-native debris off-site and re-use of native materials on-site for re-grading.

YAEC Plan: YAEC will prepare a Corrective Action Alternatives Analysis (CAAA) to reflect removal as the preferred option and will submit the CAAA to DEP by December 31, 2003. YAEC will then prepare and submit a Corrective Action Design (CAD) to describe the specific means for removal, materials management and on-site re-use of native materials. YAEC may also need to obtain one or more Beneficial Use Determinations (BUDs) from DEP to allow for the re-use of appropriate landfill materials from the SCFA for site grading and to allow subsurface foundation walls and slabs to remain in-place on-site.

5.3.1.6 Massachusetts Contingency Plan (MCP)

The MCP regulates the notification, investigation and cleanup of releases of oil or hazardous materials (OHM) to the environment (e.g., soil, groundwater, surface water and sediment). The MCP is the primary regulatory program under which non-radiological site characterization and remediation is currently being performed at the site. The MCP also has radiological risk standards which may require additional remediation beyond that specified by the LTP. The MCP dictates a five-phase, generally five-year process for comprehensive response actions. The MCP also allows for short-term risk reduction measures when there is either a potential or immediate risk of harm to human and/or when timely action clearly provides a benefit to future cleanup. Risk reduction measures may be performed at the YNPS during the course of demolition activities when, and if, localized impacts are identified.

Several discrete areas in soil and sediments contaminated with lead, petroleum and PCB-containing paint chips have already been addressed by short-term MCP risk reduction measures (Immediate Response Actions, Release Abatement Measures and Limited Removal Actions) completed to date or ongoing at the site.

Comprehensive Response Actions are ongoing to address the release in 2000 of PCB-containing paint chips from site structures to soil and sediment. Phases I through III of the MCP investigation and remediation process that define the extent of impact, need for, and type of, cleanup have been completed.

YAEC Plan: YAEC will perform Phase IV, Remedy Implementation and Phase V, Operation and Monitoring, if necessary, of its MCP remediation activities during 2004 and 2005. YAEC's goal is to sequence necessary MCP remedial actions with the decommissioning of shoreline structures to minimize disturbance to the environment (e.g., removal of impacted sediments and shoreline structures concurrently) and to support the comprehensive permitting of work within resource areas defined under the WPA.

5.3.1.7 Underground Injection Control (UIC) Program

The UIC program requires that floor drains which have the potential to discharge to ground must be closed and inspected to verify there has not been a release to the environment. YAEC formally closed two floor drains in accordance with UIC requirements in 2000.

YAEC Plan: YAEC will implement a program to identify, inspect and investigate and close any other floor drains that have the potential to discharge to ground.

5.3.1.8 Title 5 On-Site Sewage Treatment and Disposal

Massachusetts Title 5 regulations for septic systems establish the design standards and inspection requirements for septic systems. The YNPS facility currently has three septic systems, one of which is located on property owned by US Gen NE.

YAEC Plan: YAEC will inspect any septic systems that will remain in place following decommissioning and will take appropriate measures to bring these systems into compliance with Title V prior to transferring the title of the facility that the septic system serves. For any septic system that will be abandoned at the site, YAEC, will apply to the Town of Rowe to abandon the system in accordance with 310 CMR 15.354.

5.3.2 — REGULATORY COMPLIANCE PLAN – POTENTIALLY APPLICABLE FEDERAL REGULATORY PROGRAMS

Based on the site closure activities identified above, YNPS anticipates that several federal regulatory programs will be potentially applicable to non-radiological site closure activities or environmental conditions. Section 5.3.2 describes these regulations and presents YAEC's regulatory compliance plan for each regulatory program.

5.3.2.1 Resource Conservation and Recovery Act (RCRA)

YAEC submitted an application for an interim status hazardous waste storage permit in November 1980 as a protective filing. After YAEC determined that it had not needed or utilized a hazardous waste storage permit, DEP approved YAEC's request to revoke its protective filing status in a letter dated November 23, 1985. YAEC never operated a treatment, storage or disposal facility on-site pursuant to this protective filing Therefore, RCRA corrective action requirements do not apply to the YNPS facility.

YAEC is currently a Large Quantity Generator of hazardous waste and waste oil due to the volume of wastes being generated during decommissioning, specifically the management of paint waste containing PCBs. YAEC has obtained a waiver from DEP from the 90-day limit for storage of the PCB wastes and mixed wastes (i.e., wastes that are classified as radiological wastes and hazardous waste) during the course of site closure activities due to the unique nature of the waste streams and limited number of receiving facilities.

> *YAEC Plan*: YAEC will close its hazardous waste accumulation and storage areas in accordance with 310 CMR 689 by developing a closure plan to verify and document that all hazardous wastes and residues have been removed from the waste accumulation and storage areas.

5.3.2.2 National Pollutant Discharge Elimination System (NPDES)

The facility has had an NPDES permit for the discharge of storm water, service water, and non-contact cooling water from EPA and the State since the inception of the program (Permit MA 0004367). YAEC has renewed and modified the existing permit to provide for a one-time treatment and discharge of the cooling water from the spent fuel pool, for discharge of water collected from construction dewatering activities during decommissioning and remedial activities and for the management of stormwater.

> *YAEC Plan*: YAEC will maintain an NPDES permit at the site to manage stormwater discharges in effect as long as spent nuclear fuel is stored at the ISFSI at the site.

5.3.2.3 Toxic Substances Control Act (TSCA)

The Toxic Substances Control Act (TSCA) regulates the remediation of releases of PCB-containing materials with greater than 50 parts per million (ppm) total PCBs. Some of the paint chips from weathering of site structures were found to contain PCBs at concentrations greater than 50 ppm. The remedial actions completed under the MCP for soil and sediment impacted by the paint chips and their dispersal through stormwater will, therefore, require compliance with TSCA.

> *YAEC Plan*: YNPS will submit an application in late 2003 for "Risk-Based Disposal" to obtain EPA approval for its PCB cleanup actions, including the verification and management of PCB-remediation wastes. Approval of the PCB cleanup

plan is necessary in order to initiate cleanup in 2004 concurrent with the decommissioning of shoreline structures.

5.3.2.4 Federal Energy Regulatory Commission (FERC)

FERC controls activities performed within the boundaries of the Sherman Dam hydroelectric facility. Therefore, removal or modification of shoreline structures and remediation of sediments in Sherman Reservoir within these boundaries may require FERC approval of some form.

YAEC Plan: YNPS will work with US Gen NE, which holds the FERC license, to determine specifically what filings may be necessary.

5.3.2.5 Clean Water Act (CWA) Section 404

The ACOE regulates impacts to wetland areas through Section 404 of the Clean Water Act (CWA). The sediment remediation and the removal of shoreline structures will require compliance with these regulations. A Section 401 Water Quality Certificate from the DEP is required prior to the issuance of an ACOE permit.

YAEC Plan: YNPS will submit an application to the ACOE for a permit for the proposed removal of shoreline structures and remediation of sediments in Sherman Reservoir.

5.3.3 — REGULATORY COMPLIANCE PLAN – REGULATORY PROGRAMS NOT EXPECTED TO BE APPLICABLE

YAEC is in the process of confirming that some of the regulatory programs it examined during its regulatory assessment are not triggered by site closure activities and will not require specific compliance measures.

5.3.3.1 Historical and Archeological Preservation (36 CFR 800)

Based on a review of Massachusetts Historical Commission files, none of the YNPS structures are designated as historic and no historic or archeological structures are identified in the proposed project area. In response to a request from YAEC, the Massachusetts Historical Commission has issued a letter stating that the decommissioning activities are unlikely to affect significant historic or archaeological resources. Nevertheless, as discussed in Section 4.3, YAEC will conduct a comprehensive survey of historical and archeological resources within the 2,200-acre site.

YAEC Plan: YNPS will document any historical and archeological aspects of the site closure process but does not expect any formal Historical and Archeological Preservation compliance measures to be required.

5.3.3.2 Endangered Species Act (ESA, 50 CFR 402/321 CMR 10)

Portions of the site have been mapped as Priority/Estimated Habitat, which has been delineated for the Bald Eagle by the Massachusetts Natural Heritage & Endangered Species Program (NHESP). The US Fish and Wildlife Service has issued a letter stating

that it appears that no impacts to federally-listed species will occur during decommissioning. As recommended by the NHESP, YAEC is in the process of determining if rare or endangered species are, or may be present at, or in the vicinity of, the site through field inspections and mapping of species by a qualified wildlife biologist. A comprehensive natural resource inventory has been initiated and is projected to continue through 2003.

YAEC Plan: YNPS expects this inventory to confirm that compliance with ESA will not require further action.

5.4: Conclusion

YAEC has comprehensively evaluated the State and Federal environmental regulations potentially applicable to site decommissioning and site closure activities. YAEC has developed plans to achieve compliance where regulations are determined to apply. These plans incorporate a variety of environmental programs, including obtaining numerous permits and regulatory approvals. In some cases, more detailed site information is being developed and additional discussions will be held with relevant regulatory agencies to determine the applicability of a regulatory program and the scope of any required compliance activities.

SECTION 6

SITE CHARACTERIZATION

YAEC's site closure activities will include a significant site characterization effort to collect sufficient data to ensure comprehensive regulatory compliance, in both the radiological and non-radiological regulatory arenas, and to demonstrate that site closure activities meet risk and performance standards that may be required by regulators and sought by other stakeholders. Two related and coordinated site characterization programs are being conducted to support final site closure. Environmental data have been (and more will be) collected to evaluate radiological constituents in order to support the requirements of the LTP and for the Final Status Survey. Similarly, environmental data have been (and more will be) collected to characterize the nature and extent of non-radiological constituents at the site.

Environmental studies, surveys and reports have documented radiological and non-radiological constituents in environmental media (soil, sediment, water) and on building surfaces at YNPS. Environmental characterization efforts from 1992 until 1997 focused primarily on radiological constituents. During this time-period, some initial sampling for volatile organic compounds and metals in groundwater was performed. In addition, soil samples were collected to evaluate the presence of PCBs and lead in areas visibly impacted with paint chips from the Vapor Container. The purpose for conducting these early sampling efforts was to characterize conditions as necessary to proceed with decommissioning. Beginning in 1997 and continuing to-date, a program was initiated to characterize environmental conditions for non-radiological constituents in soil, groundwater, the stormwater system, and Sherman Reservoir sediments.

The study areas addressed in site characterization activities are depicted in the site map attached as Figure 6-1.

6.1: Radiological Site Characterization

The site characterization for YNPS to be described in Section 2 of the LTP includes the surveys and evaluations conducted to determine the extent and nature of the contamination at the site. The initial characterization included a Historical Site Assessment (HSA), a review of historical documents, and measurements, samples, and analyses to further define the current conditions of the site. The HSA consisted of a review and compilation of the following types of information: historical records, plant and radiological incident files, operational survey records, annual environmental reports to the NRC and personnel

interviews with present and former plant employees and contractors. The radiological data collected during this process supplements the characterization data and provides a basis for developing plans for remediation and final status surveys. As a result of the HSA and site characterization to date, approximately 2,000 acres of the approximately 2,200-acre plant site have been identified as "non impacted" as defined in the current NRC guidance for radiological site survey methods. It is expected that the radiological data collected to support the LTP and Final Status Survey will sufficiently characterize the site for both LTP purposes and to support the site risk assessments.

6.1.1 — DATA QUALITY OBJECTIVES AND QUALITY ASSURANCE PROJECT PLANS

A Quality Assurance Project Plan (QAPP) will be developed prior to collection of the Final Site Status Survey data. The QAPP will be based on guidance and procedures specified in MARSSIM, and will specify the sampling and analysis protocols to be used in collecting the Final Site Status Survey data.

Much of the site characterization data has already been collected. However, ongoing efforts in data collection for groundwater are being conducted under a set of data quality objectives developed as part of the LTP process.

6.2: Non-Radiological Site Characterization

Additional site characterization activities are planned to achieve final site characterization and closure. Where possible, the non-radiological characterization program will be coordinated with the LTP radiological characterization efforts in order to take advantage of joint field sampling opportunities to the extent feasible. YAEC expects to utilize existing data and to conduct future characterization activities describing the study areas identified in Table 6-1.

For example, groundwater sampling events will involve the collection of samples for both radiological and non-radiological analyses. YAEC's results to date are being compiled and presented in Data Usability Reports that describe the extent, quality and relevance of the existing site environmental data for site closure purposes. YAEC has also developed a Quality Assurance Project Plan and is developing Field Sampling Plans and Work Plans for designing and conducting additional site characterization necessary to fill in gaps in the existing data and to meet regulatory and stakeholder needs. Environmental non-radiological characterization data will be presented in site characterization reports.

6.2.1 — DATA USABILITY REPORTS

YAEC is currently conducting a thorough data usability assessment of the historical data collected from 1997 to date. YAEC's environmental subcontractor, Gradient, is reviewing the laboratory quality control procedures and results in order to determine whether these historical data meet data quality objectives sufficient to satisfy DEP and EPA guidelines. Using approved DEP and EPA guidelines to assess environmental data quality/usability, all usable and non-usable data will be identified in the data usability reports. Only data that is usable following current DEP and EPA guidelines will form

the basis for the final site characterization and site closure. Upon completion, data usability reports will be available for regulatory and other stakeholder review.

6.2.2 — QUALITY ASSURANCE PROJECT PLAN

Non-radiological site characterization activities will be conducted in accordance with the project Quality Assurance Project Plan (QAPP). The QAPP will conform to DEP and EPA guidelines and requirements where applicable and appropriate. YAEC will use this DEP and EPA guidance to specify the project organization, Data Quality Objectives (DQOs), sampling protocols, analytical methods, sample custody procedures, quality assurance/quality control procedures and documentation procedures.

6.2.3 — FIELD SAMPLING PLANS

The QAPP will set forth general guidelines and procedures that will be followed during further site characterization activities. While the QAPP will detail overall project procedures and guidelines, specific Field Sampling Plans will be prepared to describe in greater detail the scope and objectives of particular sampling efforts. The Field Sampling Plans will define the areas to be sampled and the chemical analyses and field procedures that will be followed. Field Sampling Plans will be developed for site characterization efforts involving groundwater, soil and other study areas.

6.3: Site Characterization Reports

Periodic status reports will be prepared as appropriate to inform stakeholders of sampling results and to support decisions regarding additional investigation and potential soil, sediment and groundwater remediation activities. Upon completion of field sampling efforts, site characterization reports will be prepared to document the results of the historical data usability analysis and to present newly collected and confirmed data to stakeholders. The results will be presented at a level of detail to allow all stakeholders to confirm that a comprehensive characterization satisfying regulatory and site closure needs has been achieved. Site maps and figures will be prepared posting the environmental conditions in order to synthesize the results and facilitate their presentation and interpretation.

These site characterization reports are intended to compile the data necessary to demonstrate compliance with applicable regulatory programs. This compilation is also intended to provide or reference the data relevant to property transfer due diligence requirements.

SECTION 7

RISK ASSESSMENTS

Environmental risk is the risk associated with the probability that exposure to a particular chemical in the environment may result in an adverse effect on human health, or an adverse effect on the health of an ecological system. Several of the regulatory programs of potential regulatory relevance or applicability to site closure require quantitative measurement and assessment of environmental risk posed by site conditions. This measurement of environmental risk is to ensure that post-closure conditions will not exceed the level of risk appropriate to the expected future property use.

YAEC has incorporated sophisticated risk assessment procedures in its site closure plan to determine a threshold for unacceptable residual post-closure levels of environmental risk and to design any remediation efforts that may be necessary to ensure that resultant post-closure risk levels are consistent with future unrestricted site use. In addition to meeting the regulatory requirements for evaluation of risk, the YNPS risk assessments are a critical component of planned stakeholder information and outreach and will support a demonstration of due diligence for potential future owners of the property. The risk assessments, like the site characterization activities, will address the industrial portion of the site and the surrounding 2,200 acres of non-industrial property. The process and criteria for the risk assessments are depicted in Figure 7-1.

7.1: Plan for Assessing Radiological and Non-radiological Risks

7.1.1 — RADIOLOGICAL RISK ASSESSMENT

The primary assessment of radiological risk will be performed as part of the LTP, and will be reviewed by the NRC. Acceptable levels of radionuclides that can remain in soil or groundwater will be calculated to be consistent with the NRC target of a total dose of 25 mrem/year above naturally occurring background radiation to a future "resident farmer." DPH requires a lower total dose from radionuclide exposure, of 10 mrem/year, for evaluating acceptable environmental levels of radionuclides. DEP evaluates risk to radionuclides by a cancer risk assessment rather than from an evaluation of dose. DEP assesses cancer risk to radionuclides in the same manner as it considers cancer risk to non-radionuclides (see Section 7.1.2). DEP's target cancer risk from all environmental contaminants combined is 1×10^{-5} above background risk levels, which corresponds to an incremental cancer risk of 1 case in 100,000 exposed individuals.

YAEC Plan: YAEC will perform its risk assessments to identify any remediation activities necessary to achieve compliance with residual radiological exposure levels that meet each of these risk standards and thereby meet the radiological standards for unrestricted future site use.

7.1.2 — NON-RADIOLOGICAL RISK ASSESSMENT

DEP gives guidance, in the MCP, for risk assessment for all environmental chemicals. Chemicals are assessed for the probability of causing carcinogenic and various non-carcinogenic health impacts. The MCP specifies levels of contamination and associated risks appropriate for unrestricted future site use, which require attaining acceptable environmental levels for a residential exposure scenario. EPA has risk assessment guidance that is very similar to DEP's and will be incorporated as appropriate. The risk assessment will define the need, if any, for remediation of non-radiological chemicals at the site.

YAEC Plan: YAEC will conduct its risk assessment and identify any remediation activities necessary to achieve compliance with contaminant exposure levels that meet the MCP risk level standards for residential future site use.

7.1.3 — COMBINED RISK ASSESSMENT

YAEC will follow DEP risk assessment practice that requires cancer estimates for radionuclide and non-radionuclide chemicals be summed together, with a cumulative target of 1×10^{-5} of incremental risk above background.

YAEC Plan: YAEC will conduct its risk assessment to identify any remediation activities necessary to achieve compliance with DEP's 1×10^{-5} target cancer risk level for combined radionuclide and non-radionuclide chemicals.

7.2: Human Health Risk Assessment Plans

The first step in conducting a risk assessment is to develop a Risk Assessment Workplan, which describes the methodologies that will be employed in the risk assessment. The Workplan will be reviewed by appropriate stakeholders to ensure that all regulatory requirements are satisfied.

MCP Method 3 risk assessment procedures for Human Health Risk Assessment (HHRA) provide guidelines for site-specific risk assessment that require combined evaluation of radionuclide and non-radionuclide chemicals in site soils, sediments, surface water, and groundwater. The site characterization activities described in Section 6 and the results of radiological characterization activities conducted for the LTP will provide the bases for assessing cancer (radionuclides and non-radionuclides) and non-cancer (non-radionuclides) risks according to MCP Method 3 procedures. A future residential use of the site is presumed under Method 3 guidelines to evaluate whether the resultant risk levels will allow unrestricted future site use. The Method 3 risk assessment will form the basis for determining the remedial action cleanup levels necessary for unrestricted (residential) future site use. If a portion of the site cannot be remediated

to the standards consistent with residential use, then other non-residential use scenarios will be evaluated for that portion of the site.

YAEC Plan: YAEC will develop a Workplan for Evaluating Human Health Risks to Combined Radionuclide and Non-Radionuclide Chemicals at the YNPS Site consistent with MCP Method 3 procedures. The HHRA Workplan will describe the exposure areas, the contaminants of concern that will be assessed in the risk assessment, or a protocol for developing the list of contaminants of concern, the exposure pathways, the methodology for combining radionuclide and non-radionuclide risks, and will list the guidance documents that will be followed in performing the risk assessment. The Workplan will be the first step in performing the risk assessment, and will allow stakeholder review and input early in the risk assessment process.

7.3: Ecological Risk Assessment Plans

Similar to the Human Health Risk Assessment, the first step for the Ecological Risk Assessment will be to develop an Ecological Risk Assessment Workplan. This Workplan will describe the guidance and methodologies that will be followed in the Ecological Risk Assessment and can be reviewed by appropriate stakeholders for input prior to initiation of the risk assessment itself.

MCP Method 3 guidelines also identify the procedures for assessing ecological risks at the YNPS Site. These guidelines call for a two-stage process. Stage 1 is the performance of an Environmental Screening, which may or may not be followed by performance of a Stage 2 Risk Characterization, depending on the Stage 1 results.

The MCP Stage 1 Environmental Screening for the YNPS Site will identify site-appropriate ecological receptors of potential concern, such as particular wildlife, fish and plants, together with any Areas of Critical Environmental Concern, Species of Concern, Threatened Species, or Endangered Species. If a Stage 2 Risk Characterization is found to be necessary for the YNPS Site, it will take into consideration any remediation planned or conducted as a result of the LTP and/or HHRA. The acceptable risk target under the MCP Method 3 guidelines is a Hazard Index of 1 for each potential ecological receptor. The Stage 2 Risk Characterization would quantify the relevant Hazard Indices and serve as the basis to determine if any additional remediation for protection of ecological systems would be required for receptors.

YAEC Plan: YAEC will develop a Workplan for the YNPS Site Ecological Risk Assessment Stage 1 Environmental Screening and, if necessary, the Stage 2 Risk Characterization. The Workplan will describe the methodologies to be used in both the Stage 1 and 2 assessments, and will list guidance documents and primary literature that will serve as the basis of the work. The Workplan will be the first step in performing the risk assessment, and will allow stakeholder review and input early in the risk assessment process.

7.4: Conclusion

The YNPS Site is subject to a variety of risk assessment requirements and will be expected to meet a number of acceptable risk criteria set forth by NRC, DPH, and DEP in order to ensure future unrestricted site use. YAEC will conduct several site risk assessments:

- Radionuclide dose risks will be assessed in accordance with the LTP prepared for NRC approval. The NRC-acceptable dose limit is 25 mrem/year above naturally occurring background radiation.
- Radionuclide dose will also be assessed for comparison to the DPH 10 mrem/year limit. A Workplan will be developed, which will describe the methodology by which this comparison will be made.
- Combined radionuclide and non-radionuclide cancer and non-cancer risk to human health will be assessed in the Human Health Risk Assessment under DEP MCP guidance. The acceptable cancer limit from combined radionuclide and non-radionuclides is 1×10^{-5} (assessed as an increment above background), and the acceptable non-cancer limit is a Hazard Index of 1.
- Ecological site risks will be assessed in a one- or two-stage Ecological Risk Assessment under DEP MCP guidance. Generally, a Hazard Index of 1 for each potential ecological receptor is considered to be acceptable risk.

SECTION 8

REMEDIATION PLAN

8.1: Regulatory Setting

Remedial actions at the YNPS will be required to remediate impacts at the site from both radiological and non-radiological constituents.

YAEC Plan: YAEC will conduct any required radiological restoration in accordance with the LTP as approved by the NRC. Restoration of impacts from non-radiological constituents presently known to be required will be conducted primarily following the requirements of the MCP. YAEC will conduct non-radiological site assessment and remedial response actions under the oversight and authority of a Licensed Site Professional (LSP) who will ensure compliance with MCP requirements and certify cleanup.

8.2: Radiological Remediation

Remediation actions may be required to reduce the radioactivity levels below the applicable cleanup criteria. The specific remedial actions depend on the type of area under consideration. These area types are categorized as one of the following:

- Structures (including building interiors and exteriors, major freestanding exterior structures, exterior surfaces of plant systems, and paved exterior ground surfaces);
- Soils; and
- Groundwater and surface water.

Decommissioning activities and remediation activities will be performed in accordance with applicable site procedures.

8.2.1 — SOILS

Soils not meeting the criteria for license termination will be removed and disposed of as radioactive waste. Offsite fill may be used to replace the excavated materials. The site characterization process establishes the location, depth and extent of soil contamination. As needed, additional investigations will be performed to ensure that any soil contamination profiles that may change during the remediation actions are adequately identified and characterized.

8.2.2 — STRUCTURES

Only a small portion of site structures will remain at the time of license termination. Remaining concrete from contaminated structures will be remediated to a level meeting the radiological criteria for unrestricted release of the site. Methods for remediating structures may include a variety of techniques, and a number of factors determine the choice of the remediation method for a given area.

Remediation activities for an area may include wiping, vacuuming, and washing with low- or high-pressure applications. Surfaces may also be remediated using surface removal techniques such as scabbling or grinding. Use of surface removal techniques controls the removal depth, minimizing the waste volume produced.

8.3: PCB Remediation Plan

The most significant environmental remediation project currently underway at the site involves cleanup of soil, wetlands and sediment contamination resulting from chips of PCB-containing paint used to coat building surfaces at the facility. This remediation is expected to consist of excavation, removal and off-site disposal of paint chips with PCBs in the soils and sediments from Sherman Reservoir, adjacent shoreline areas and upland areas of contamination. The ongoing sediment characterization activities for both radiological and non-radiological impacts will be used to define the volume and areas of soil and sediment requiring abatement.

8.3.1 — REMEDIAL CLEANUP OBJECTIVE FOR PCB REMEDIATION

Both soil and sediment remediation is currently expected to be required to meet the MCP's Permanent Solution standard and to satisfy TSCA requirements. Four areas with exposed soil have been identified as requiring remediation to address the PCB-paint chip release. The total volume of soil requiring remediation in these areas is estimated to be approximately 2,000 cubic yards, over an approximately one-acre area adjacent to the former power plant. Two sediment areas have been identified as requiring remediation to address the PCB-paint chip release. The total volume of sediment requiring remediation in these areas is estimated at approximately 550 cubic yards, over an area of approximately one-third of an acre.

> *YAEC Plan:* YAEC will conduct its remediation of PCB impacts to soil and sediment in order to achieve a remedial action objective of one ppm PCB in soil and sediment. Under the MCP, this cleanup level will restore the site to a condition of "No Significant Risk", meet MCP performance standards for a Permanent Solution for the site and be consistent with federal standards for cleanup under TSCA.

8.3.2 — PCB REMEDIATION PROCEDURES

The current plan for the remediation of the sediment in Sherman Reservoir is to isolate the impacted area with sheet piles, dewater the remedial area and excavate the impacted sediments. Excavated sediments will then undergo further dewatering following excavation to reduce the liquid content to the extent necessary to enable loading and transpor-

tation off-site for disposal as a solid in an appropriate facility. Impacted soils and sediments from the west storm drain will be excavated by mechanical means.

PCB-impacted soil and sediment from the site must be disposed of in accordance with the federal TSCA requirements of 40 CFR 761. In the event that remediation wastes require management for radiological constituents, the wastes would either be shipped to a licensed radiological/mixed-waste disposal facility, or depending on the volume of material and degree of radiological impact, possibly treated on site (e.g., using *ex situ* thermal technologies for PCBs), prior to off-site disposal or re-use on site.

8.4: Other Remediation Activities

The need for, and type of, any other remediation to address risks from radiological and non-radiological constituents will be determined by the results of the site characterization activities described in Section 6 and the risk assessment results described in Section 7. Additional site characterization will be completed in 2003 and 2004 to identify any additional areas requiring remediation.

REFERENCES

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U.S. Environmental Protection Agency, Region I. 1988. "Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses." (for pesticide/PCB analyses).

FIGURE 2-1: Site Location

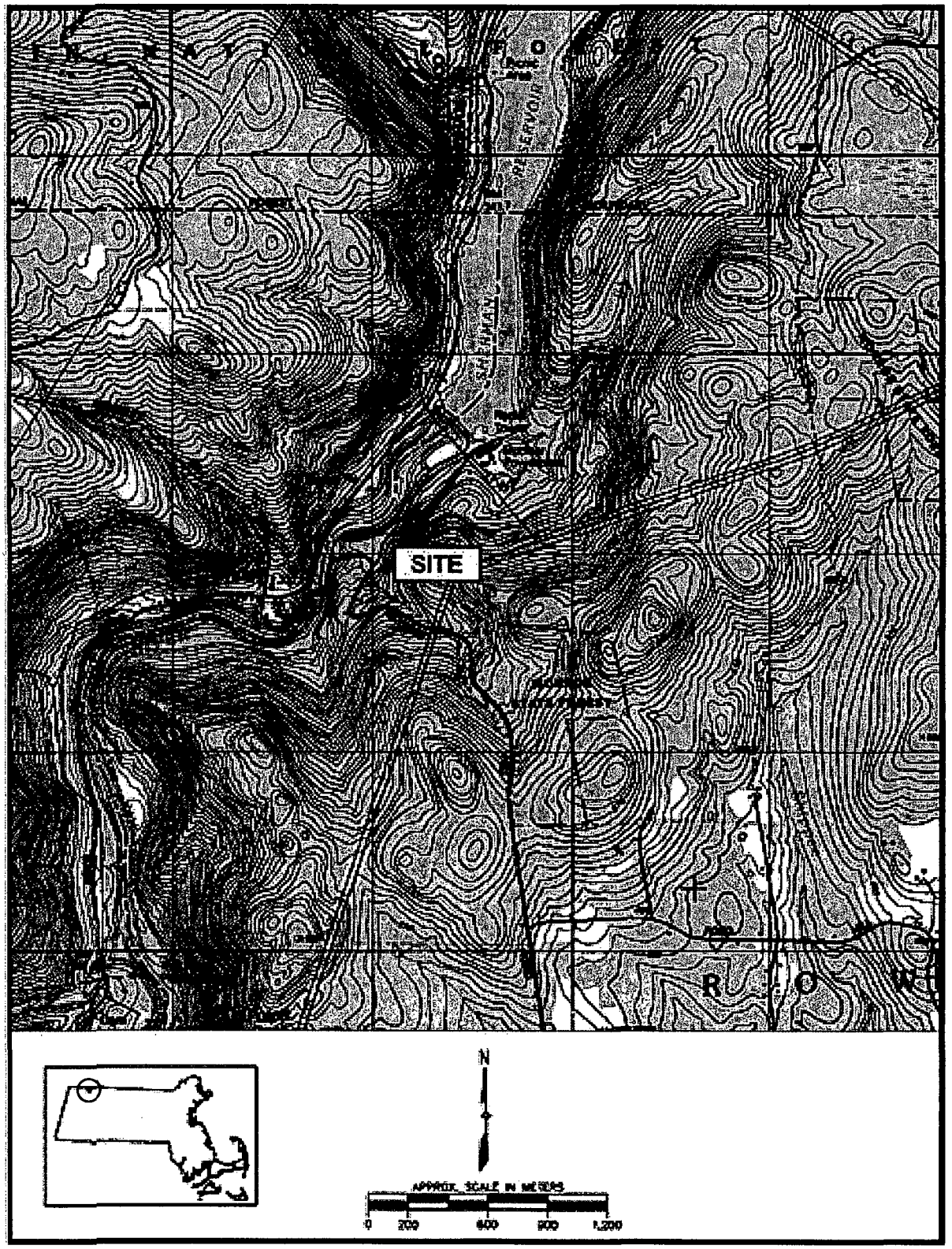

FIGURE 2-2: Site Closure Project Conceptual Plan

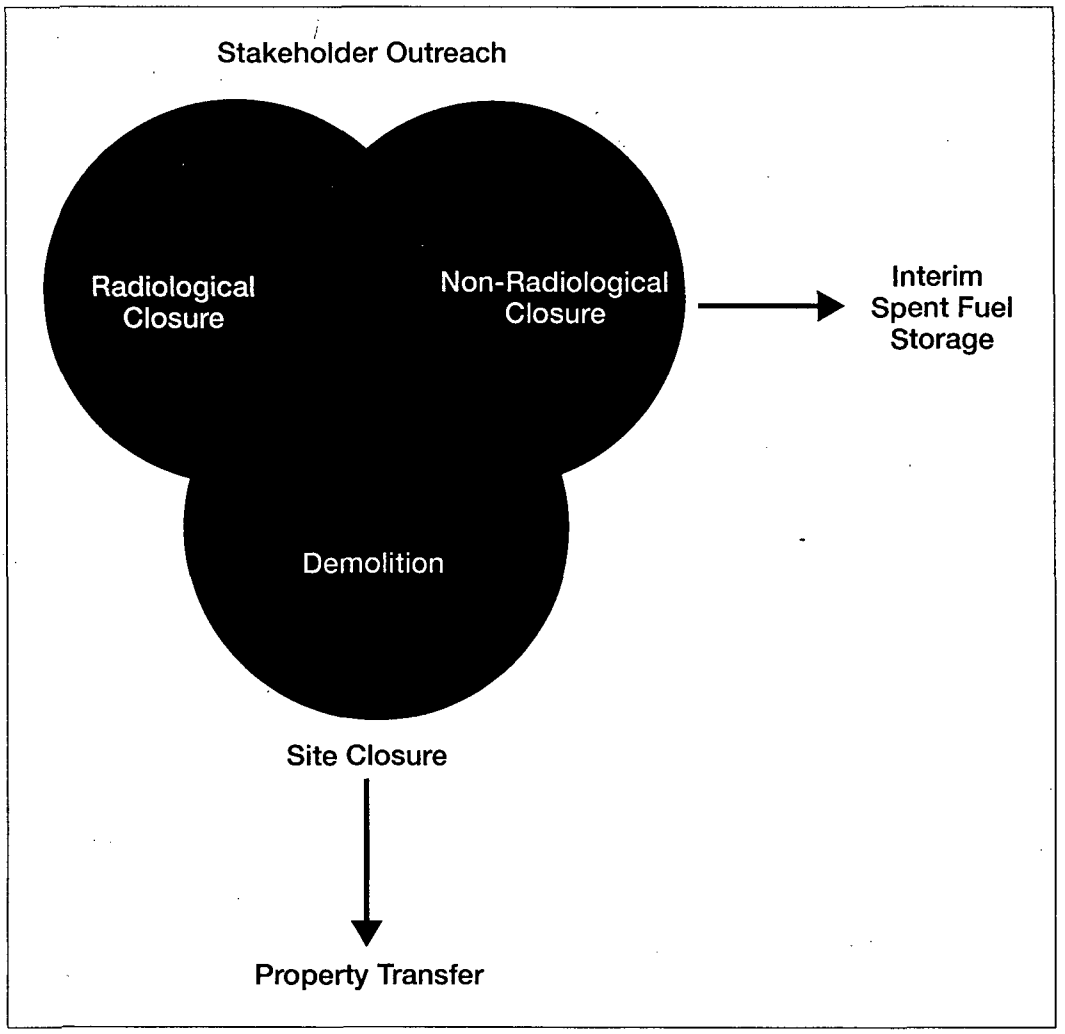

FIGURE 2-3: Site Closure Process

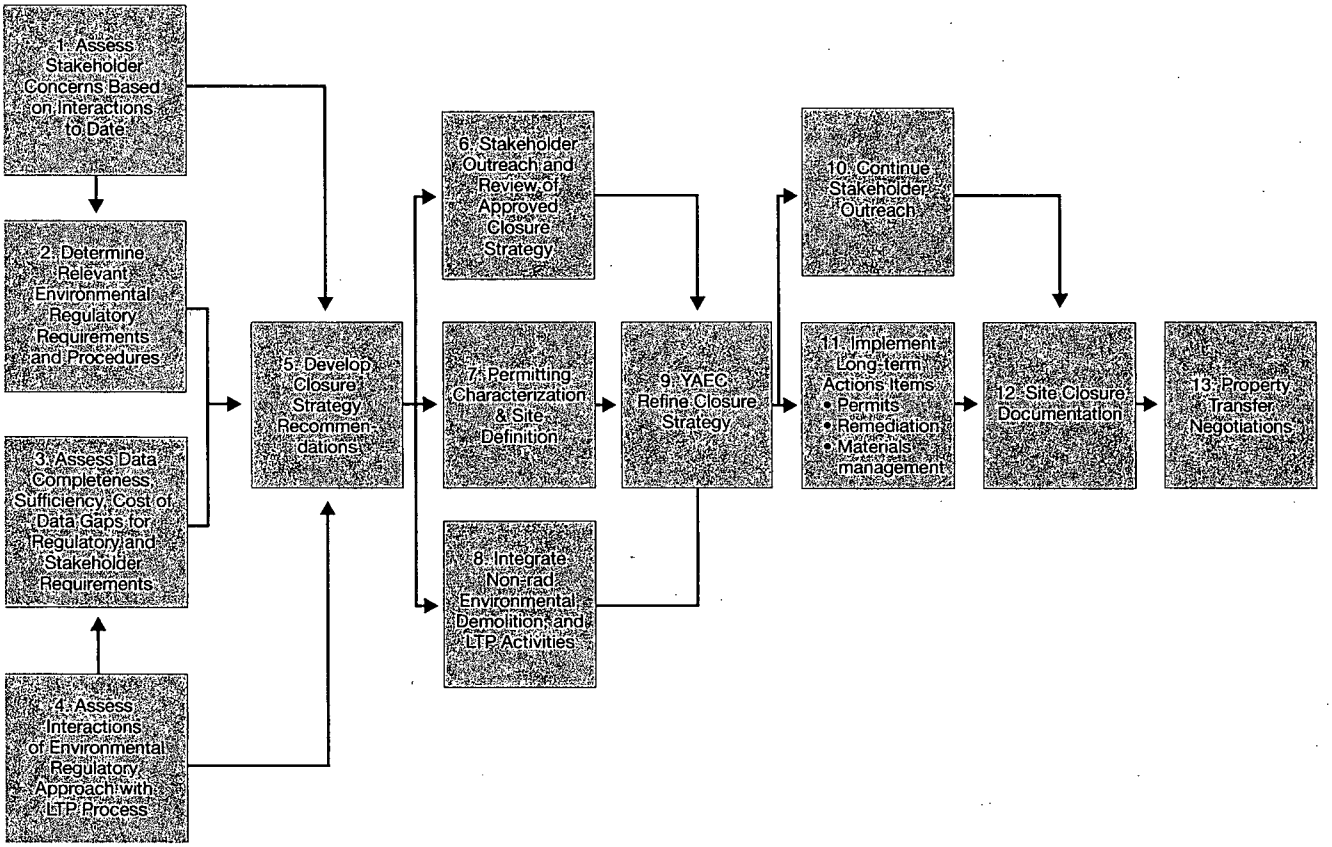

FIGURE 5-1: Environmental Closure Regulatory Summary

		Building Demolition								PCB Paint Chip Remediation		
Regulatory Program	**Agency**	**Demolition Beyond Wetland Buffer Zone/ Riverfront Area**	**Demolition in Wetland Buffer Zone/ Riverfront Area**	**Spent Fuel Pool Discharge**	**Hazardous Waste Storage Areas**	**Shoreline Structure Removal[1]**	**Demolition Rubble Management[2]**	**Landfill Closure**	**Septic System Closure**	**Sherman Reservoir[1]**	**W. Drainage Ditch**	**Surface Soil**
Lisence Termination Plan 10CFR50	NRC	LTP										
Massachusetts Environmental Policy Act (301 CMR 11)	EOEA	ENF (Wetlands)	ENF (Wetlands)	ENF (Wastewater)	NA	ENF (Wetlands)	ENF (Transportation)	NA	NA	ENF (Wetlands)	ENF (Wetlands)	NA
Wetlands Protection Act (310 CMR 10)	DEP/Rowe Conservation Commission	NA	RFDA or NOI	NA	NA	NOI	RFDA or NOI	RFDA or NOI	RFDA or NOI	NOI	NOI	NA
Massachusetts Clean Water Act (314 CMR 9)	DEP	NA	NA	NA	NA	401 WQC	NA	NA	NA	401 WQC	NA	NA
Clean Water Act—Section 404 (33 CFR 320)	ACOE	NA	NA	NA	NA	PGP or IP	NA	NA	NA	PGP or IP	NA	NA
Public Waterfront Act—Chapter 91 (310 CMR 9)	DEP	NA	NA	NA	NA	Chapter 91 Permit	NA	NA	NA	Chapter 91 Permit	NA	NA
Solid Waste Regulations (310 CMR 19)	DEP	NA	NA	NA	NA	NA	BUD	CAAA and CAD	NA	NA	NA	NA
Massachusetts Contingency Plan (310 CMR 40)	DEP	RAM Plan	RAM Plan	NA	NA	NA	NA	NA	NA	RAM Plan or Phase IV RIP	RAM Plan or Phase IV RIP	RAM Plan or Phase IV RIP
Toxic Substances Control Act (40 CFR 761)	EPA	NA	NA	NA	NA	NA	NA	NA	NA	Risk Based Disposal Approval	Risk-Based Disposal Approval	Risk-Based Disposal Approval
National Pollutant Discharge Elimination System (NPDES) (40 CFR 122)	EPA/DEP	NA	NA	NPDES Permit	NA	NA	NA	NA	NA	NA	NA	NA
Resource Conservation and Recovery Act—Corrective Action	EPA	RFA/RFI/CMS										
Hazardous Waste Management Act (310 CMR 30)	DEP	NA	NA	NA	Closure	NA	NA	NA	NA	NA	NA	NA
Title 5—Massachusetts Environmental Code (310 CMR 15)	DEP	NA	NA	NA	NA	NA	NA	NA	Inspect to Closure	NA	NA	NA
Endangered Species Act (50 CFR 402)	EPA	Habitat Protection										

[1] Activities will occur on property not owned by Yankee. Activity may require coordination with property owner (USGen NE)

[2] Assumes no filling within wetland buffer zone.

See key on following page

Key

FIGURE 5-1: Environmental Closure Regulatory Summary

Regulatory agency approval or permit required

More detailed information or meeting with agency required, or work scope not defined

No action required

ACOE - U.S. Army Corps of Engineers

BUD - Beneficial Use Determination

CAAA - Corrective Action Alternatives Analysis

CAD - Corrective Action Design

CEQ - Council on Environmental Quality

CMS - Corrective Measures Study

DEP - Massachusetts Department of Environmental Protection

DPH - Massachusetts Department of Public Health

EIR - Environmental Impact Report

ENF - Environmental Notification Form

EOEA - Executive Office of Environmental Affairs

EPA - U.S. Environmental Protection Agency

IP - Individual Permit

LTP - License Termination Plan

NA - Not Applicable

NRC - Nuclear Regulatory Commission

NOI - Notice of Intent

PGP - Programmatic General Permit

RAM - Release Abatement Measure

RFA - RCRA Facility Assessment

RFDA - Request for Determination of Applicability

RFI - RCRA Facility Investigation

RIP - Remedy Implementation Plan

WQC - Water Quality Certification

FIGURE 6-1: Site Map Depicting Study Areas

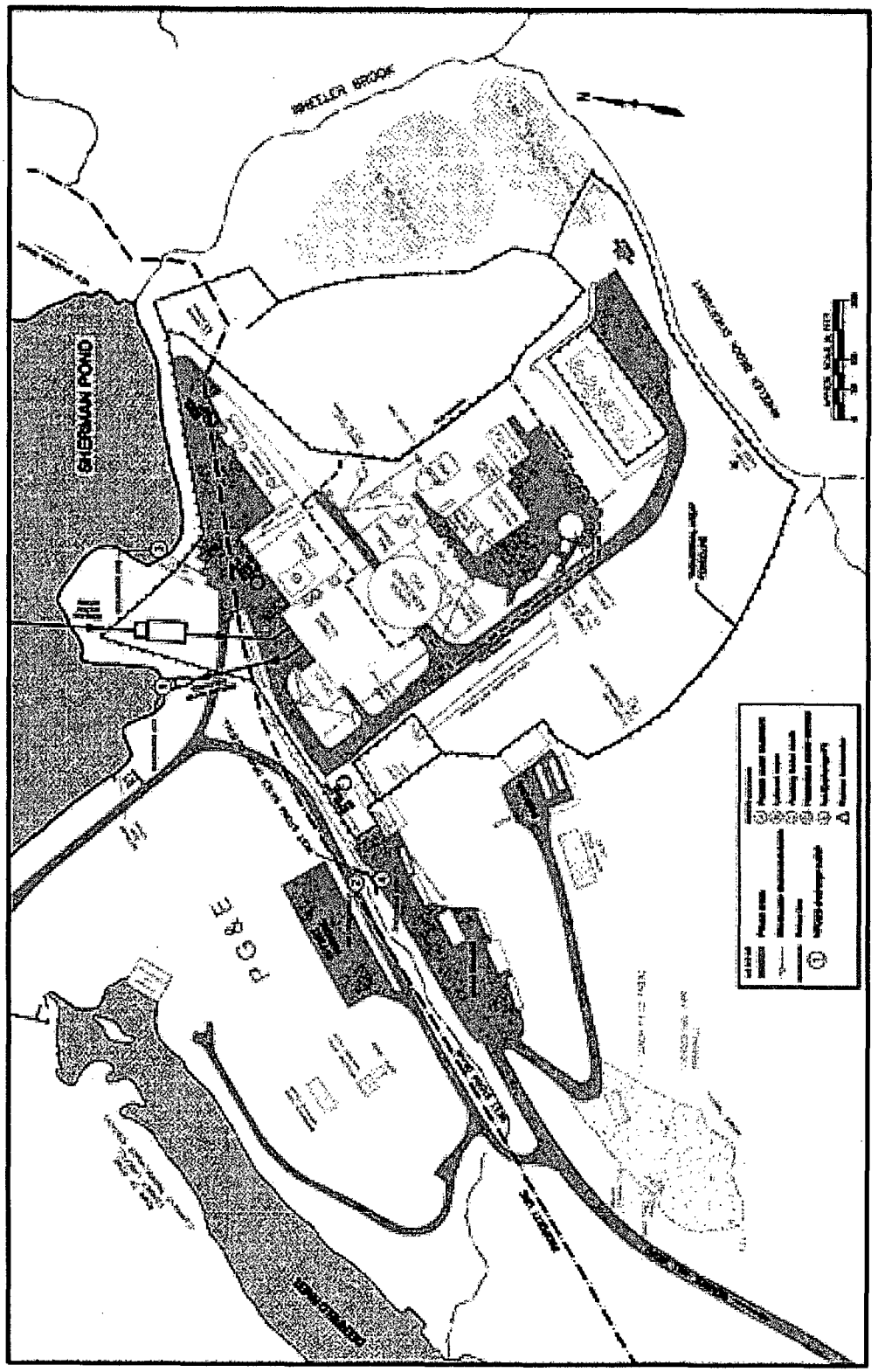

FIGURE 7-1: Approach to Environmental Site Closure

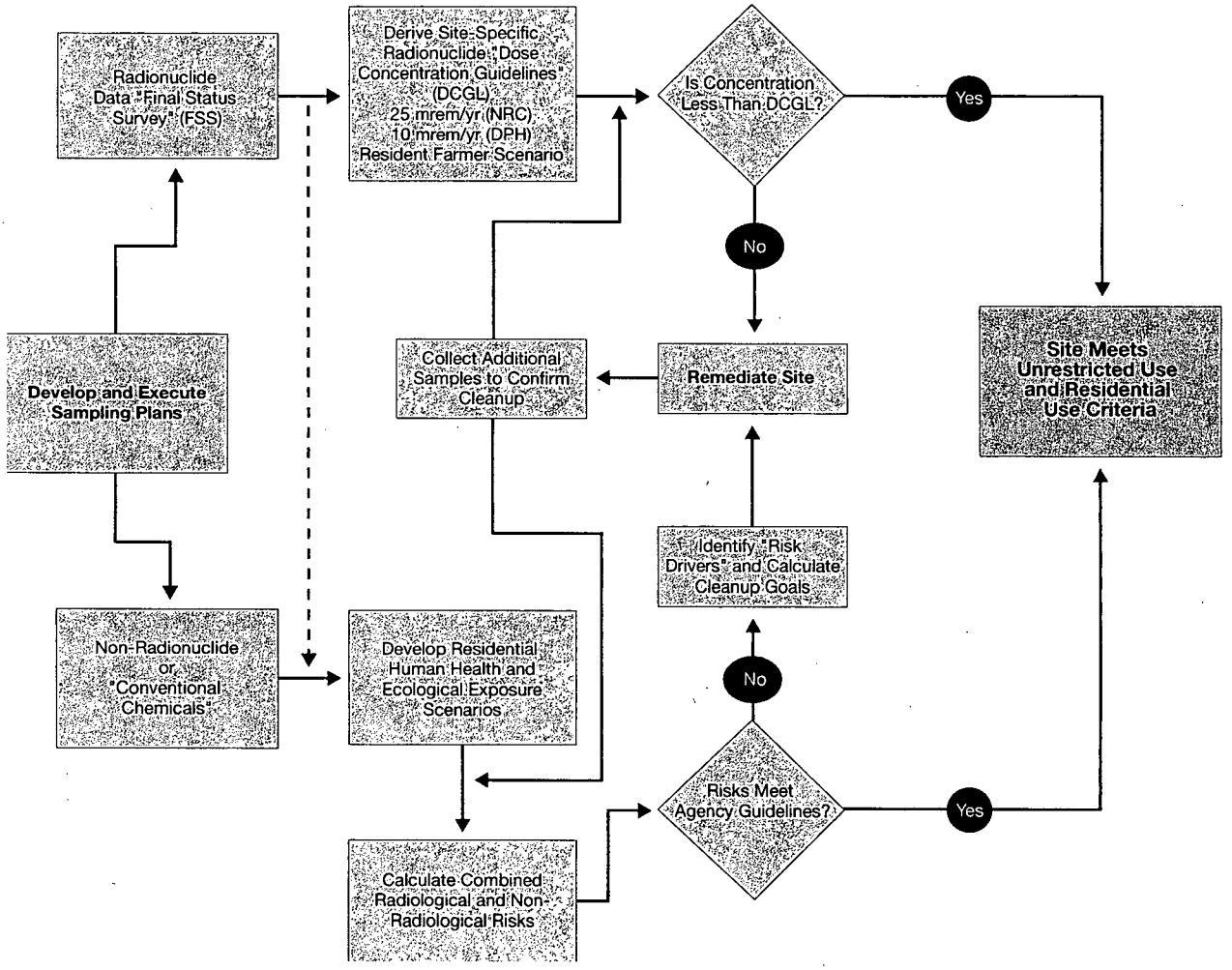

TABLE 1-1: State and Local Non-Radiological Regulatory Compliance Plan

Program	Compliance Plan
Massachusetts Environmental Policy Act (MEPA)	YAEC will assess whether any review triggered by MEPA thresholds could be consolidated with other environmental review procedures that may be required by other agencies (e.g., FERC or ACOE).
Wetlands Protection Act (WPA)	YAEC will submit a Notice of Intent in advance of the removal of shoreline structures and sediment, the decommissioning activities that are expected to impact wetland resource areas.
Clean Water Act (CWA)	YAEC will file an application for a Section 401 Water Quality Certificate concerning the remediation of sediment in Sherman Reservoir and removal of shoreline structures.
Chapter 91	YAEC will confirm the applicability of Chapter 91 and file an application for a Chapter 91 permit for the anticipated remediation of sediment in Sherman Reservoir. It is not anticipated that a Chapter 91 license or permit will be required for removal of shoreline structures.
Massachusetts Solid Waste Regulations	YAEC will prepare and submit a Corrective Action Design (CAD) to describe the specific means for removal, materials management and on-site re-use of native materials in its remediation of the SCLF. YAEC may seek one or more Beneficial Use Determinations (BUDs) to allow for the re-use of the landfill materials from the SCFA for site grading and to allow subsurface foundation walls and slabs to remain in-place on-site.
Massachusetts Contingency Plan (MCP)	YAEC will perform Phase IV, Remedy Implementation and Phase V, Operation and Monitoring, if necessary, of its MCP remediation activities during 2004 and 2005. YAEC's goal is to sequence necessary MCP remedial actions with other site decommissioning activities to minimize disturbance to the environment (e.g., remove impacted sediments and shoreline structures concurrently).

TABLE 1-2: Federal Non-Radiological Regulatory Compliance Plan

Program	Compliance Plan
Resource Conservation and Recovery Act (RCRA)	YAEC will close its hazardous waste accumulation and storage areas in accordance with 310 CMR 30.689 by developing a closure plan to verify and document that all hazardous wastes and residues have been removed from the waste accumulation and storage areas.
National Pollution Discharge Elimination System (NPDES)	YAEC will maintain its NPDES permit in effect as long as storage of containerized nuclear fuel in the ISFSI continues at the site to regulate stormwater discharges from the site or as long as required under federal and state regulations.
Toxic Substances Control Act (TSCA)	YAEC will submit an application in late 2003 for "Risk-Based Disposal" to obtain US EPA approval for its PCB cleanup actions, including the verification and management of PCB-remediation wastes.
Federal Energy Regulatory Commission (FERC)	YAEC will work with US Gen NE, which holds the FERC license, to determine specifically what filings may be required.
Clean Water Act (CWA)	YAEC will submit an application to the ACOE for an Individual Permit (IP) for the proposed removal of shoreline structures and remediation of sediments in Sherman Reservoir.

TABLE 2-1: Site Closure Activities Accomplished to Date

Dry Fuel Storage (ISFSI)	
Construction of ISFSI Compound	Complete
Fabrication of Dry Cask Storage System (Casks, Lifting Equipment)	Complete
DOE Fuel Loading Notifications	Complete
NRC Part 72 Notifications	Complete
Fuel Transferred from Wet to Dry Storage	Complete
Spent Fuel Pool Drained and Decontaminated	Complete
License Termination Plan (LTP)	
Develop Schedule for LTP Development	Complete
Draft LTP for Stakeholder Review/Comment	Fall 2003
Submit LTP for NRC Review	Fall 2003
Complete Decontamination/Dismantlement	
Major Commodity Removals	
4 Steam Generators/Pressurizer	Complete
Reactor Pressure Vessel (RPV)	Complete
Major Building Demolition	
Diesel Generator Building (DGB)	Complete
Safety Injection Building (SI)	Complete
Warehouse & Service Building Annex	Complete
Environmental and Site Closure Activities	
Site Closure Project Plan (SCPP)	Complete
Site Assessments for Southeast Construction Fill Area (SCFA)	Complete
SCFA Site Closure Determination (Removal)	Complete
PCB Phase II Site Investigations under MCP	Complete
Submit PCB Phase II/III Report (MCP)	Complete
Submit Project Phase I Demo Wetlands Determination	Complete
MCP Limited Removal Actions in Soil (lead, PCBs and petroleum)	Complete
Initiate Groundwater Characterization	Complete
Initiate Sediment Characterization	Complete
Initiate Soil Characterization	Fall 2003

TABLE 2-2: Planned Site Closure Activities

Dry Fuel Storage (ISFSI)	
Evaluation of Site Specific License, Part 72 vs. Part 50	Fall 2003
Commencement of Fuel Shipments to DOE	2010
License Termination Plan (LTP)	
Submittal to NRC	Fall 2003
LTP Public Meeting	January 2004
NRC SER Issued	Summer 2004
NRC Licensing Board Hearing (if necessary)	Fall 2004
LTP Approval	December 2004
Complete Decontamination/Dismantlement	
PCB Soil Remediation	Fall 2004
Radiological Decontamination Complete	Fall 2004
Final Status Survey (FSS) Complete	Fall 2004
Confirmatory Survey(s) DPH and NRC	Fall 2004
Demolition of Site Structures (above grade)	Fall 2004
Demolition of Site Subsurface Structures	Spring 2005
Final Site Restoration/Grading	Fall 2005
Environmental and Site Closure Activities	
Site Closure Project Plan Stakeholder Outreach	Fall 2003
Submit BUD Applications (SCFA/Subsurface Structures)	Fall 2003
Submit NEPA/MEPA Reports	Winter 2003
Submit Wetland Permit Applications	Winter 2003
Obtain Necessary Wetland Permits and Approvals	Spring 2004
Obtain DEP Approval of BUD Permit	Fall 2003
SCFA Removal	Fall 2004
Issue Final Environmental Closure Report	2005

TABLE 6-1: YNPS Study Areas

Area Designation	Description	Areas of Investigation
Industrial Areas	Areas within fenced boundary, including "Radiologically Controlled Area" (RCA)	• Areas of material usage/storage (e.g., oils, fuels, water treatment additives, solvents, former transformers, etc.) • Waste storage areas • Former Underground Storage Tanks (USTs) • Above-ground Storage Tanks (ASTs)
Non-Industrial Areas	Areas outside fenced operational area	• Roadways/parking areas • Administration/offices, guard house areas • Old and new shooting ranges • Background areas • US Gen. NE property
Storm Water System	Surface water collection/discharge	• Catch basins • West storm drain • East storm drain • Outfalls to Sherman Reservoir and Deerfield River
Cooling Water System	"Circulating Water System"	• NPDES Outfall to Sherman Reservoir
Disposal Areas	Historical non-hazardous fill areas	• Southeast Construction Fill Area (SCFA) • ABC Rubble Disposal – Monroe Hill Road
Leach Fields	Septic leaching areas	• Current leach fields • Former leach field (1978)
Surface Water Bodies	Surface water/sediment areas bordering the site	• Sherman Reservoir • Wheeler Brook • Deerfield River