



COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
WESTERN REGIONAL OFFICE

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APR 08 2009

Yankee Atomic Electric Company  
49 Yankee Road  
Rowe, MA 01367  
Attention: Wayne Norton, President

RE: Rowe-BWSC-RTN #1-13411  
Phase II – Comprehensive Site Assessment Report  
**Final Report - Review**  
**Public Comments Addressed**  
310 CMR 40.0000  
Yankee Nuclear Power Station  
49 Yankee Road

Dear Mr. Norton:

On October 16, 2008, the Massachusetts Department of Environmental Protection (the MassDEP) issued for public comment its Review of the Final Phase II - Comprehensive Site Assessment Report (the Final Report) for environmental assessment of the Yankee Nuclear Power Station (YNPS) in Rowe, MA, according to the MassDEP's Bureau of Waste Site Cleanup (BWSC) regulations at 310 CMR 40.000 (the Massachusetts Contingency Plan, or the MCP). The Final Report Review was copied to multiple parties, and a public notice was published in the Greenfield Recorder newspaper on November 21, 2008, which began the 30-day public comment period for the Final Report Review. MassDEP received one comment letter during the public comment period, from the Franklin Regional Council of Governments (FRCOG), on December 12, 2008.

Summary of Comments/Responses to Comments

The FRCOG comments are summarized as follows:

1. FRCOG supports long-term monitoring of surface water and groundwater at the YNPS, in particular, long-term monitoring of surface water of the Deerfield River due to the extensive use of the river for rafting, fishing, and swimming.

MassDEP Response: The Final Report Review and Groundwater Monitoring Plan Review require long-term (30 year) post-closure groundwater monitoring of the YNPS site and 30-

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DEP on the World Wide Web: <http://www.mass.gov/dep>

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year post-closure groundwater and surface water (Wheeler Brook) monitoring of the Southeast Construction Fill Area (SCFA). MassDEP has modified Condition 4 of this Final Report Review, to include post-closure surface water monitoring of three locations in the Deerfield River and Sherman Reservoir, with the results of such monitoring submitted to MassDEP and copied to FRCOG on a regular basis.

2. FRCOG expresses concern about contaminants found downstream of the YNPS in the Deerfield River, and requests that MassDEP state specifically whether fishing, swimming and rafting/kayaking are safe activities in the Deerfield River and Sherman Reservoir, based on the results of monitoring and the risk assessment.

MassDEP Response: As described in the Final Report Review, sampling showed slightly elevated levels of some contaminants in Sherman Spring and the Deerfield River immediately downriver of the YNPS (just below the Sherman Reservoir Dam), and at the Intake/Discharge area in Sherman Reservoir. The Final Report Risk Assessment showed that these slightly elevated contaminant levels in the immediate vicinity of the YNPS do not pose a risk to human health or the environment. All other sampling in the Deerfield River downstream of the YNPS (including samples upstream and downstream of the Monroe Bridge Dam), and elsewhere in Sherman Reservoir, did not show evidence of such contamination. MassDEP's Office of Research & Standards approved the conclusions of the Risk Assessment, that the surface water, sediments and fish of the Deerfield River and Sherman Reservoir, even in the immediate vicinity of the YNPS, do not pose a significant risk to human health and the environment. Therefore, fishing, swimming, and rafting/kayaking in all portions of the Deerfield River and Sherman Reservoir do not pose a significant risk to human health in relation to any contamination or impacts from the YNPS, as evaluated under current MassDEP regulation, policies and guidance.

3. FRCOG comments that escrow accounts may be more secure in the long term than the Letters-of-Credit referenced in the Final Review for the financial assurance mechanisms (FAMs) for post-closure maintenance and monitoring of the YNPS Beneficial Use Determination (BUD) area and the SCFA.

MassDEP Response: The Final Review had incorrectly referred to the existing BUD area and SCFA FAMs as Letters-of-Credit, however upon further consultation with the MassDEP Boston Office, the MassDEP Regional Office has confirmed that the two existing FAMs established by Yankee are actually Trust Agreements (Trust Funds) which are fully funded by cash accounts in place with the Trustee Bank. Trust Funds are one of the specifically approved FAMs in the MassDEP solid waste regulations at 310 CMR 19.051(12)(a) for post-closure maintenance and monitoring. As required at 310 CMR 19.051(12)(a), the Trust Funds for the YNPS BUD Area and SCFA have been established for the full 30-year post-closure period, and the documentation of the Trust Funds was reviewed by the Boston Office of the MassDEP (with copies of all such documentation retained at the MassDEP Boston office) to ensure full compliance with the FAM regulations and requirements.

4. FRCOG supports the Deed Restriction for the YNPS BUD Area, including the MassDEP requirement that no potable water supply wells be installed within the BUD Area. FRCOG expresses concern over the tritium plume in the groundwater at the BUD Area and potential impacts to fish in the river/reservoir from the tritium, and FRCOG supports remediation of the tritium plume rather than attenuation through dilution and decay.

MassDEP Response: MassDEP notes that it does not anticipate any change in its requirement prohibiting the installation of potable wells within the BUD Area, at least not within the 30-year post-closure maintenance and monitoring period. The Final Report Risk Assessment showed no significant risk to human health and the environment for fish in the Deerfield River and Sherman Reservoir. Tritium was detected in one fish sample from Sherman Reservoir above background levels but below risk levels, however remaining fish samples from the river and Sherman Reservoir showed background tritium levels equivalent to or below the levels found in the background (upriver) fish samples from Harriman Reservoir. MassDEP acknowledges that, at this time, institutional controls (the BUD deed restriction), natural attenuation of the groundwater tritium plume, and long-term monitoring is the most feasible option for managing the groundwater tritium plume, for the following reasons: the technical infeasibility of remediation of tritium; the relatively short half-life of tritium (12 years); and the fact that the USEPA drinking water standard for tritium of 20,000 picocuries/liter is only exceeded in one groundwater monitoring well located in the immediate location of the leak in the former Spent Fuel Pool, at 25,700 picocuries/liter in March, 2008.

MassDEP appreciates the input from FRCOG and FRCOG's support of MassDEP's monitoring and oversight of the YNPS site.

### **I. SUMMARY OF FINAL REPORT**

The MassDEP's approval of this Final Phase II Report, as described below, represents the final approval necessary to achieve site closure under the Massachusetts Contingency Plan. The Final Phase II Report consists of a number of individual reports, submitted on behalf of Yankee Atomic Electric Company (Yankee) by its consultants to satisfy the requirements of the MassDEP's October 7, 2005 review of the Interim Phase II Report (the Interim Phase II Review). The primary environmental consultant for the Final Phase II reports was ERM, Inc. of Boston, MA, and the Licensed Site Professionals (LSPs) of record for these reports were John McTigue and Gregg Demers of ERM.

YNPS was shut down in 1992 and has undergone decommissioning in accordance with Nuclear Regulatory Commission (NRC) regulations under 10 CFR Part 50. All radiological issues associated with decommissioning fall under the authority of the NRC, the Massachusetts Department of Public Health's Radiation Control Program (the MADPH), the MassDEP and the United States Environmental Protection Agency (the EPA), as applicable. The NRC issued on August 10, 2007 a partial release of the YNPS License Termination Plan (LTP) for all areas of the YNPS site except the Independent Spent Fuel Storage Installation (ISFSI). The MADPH issued its partial release approval to YNPS on March 14, 2008. Non-radiological contamination at the site falls under the authority of the MassDEP and the EPA, as applicable. The assessment and remediation of polychlorinated biphenyls (PCBs) at the YNPS was primarily performed according to the authority and oversight of the EPA, in accordance with EPA Toxic Substance Control Act (TSCA) requirements and approvals. The EPA approval letter for the PCB remediation was issued to Yankee on April 26, 2006, and the required PCB Remediation Certification statement was completed by Yankee on March 28, 2007. The MassDEP had previously classified the YNPS site as a Tier 1B site, according to the BWSC regulations at 310 CMR 40.000.

The Final Phase II Report contains the results of assessment for both radiological and non-radiological parameters at the site. All assessment and remedial actions at the YNPS site have at this point been completed (with the exception of the ISFSI utilized for spent fuel storage, which is not within MassDEP authority). Yankee completed cumulative (radiological and non-radiological) Human Health and Ecological Stage II Risk Assessments (the Risk Assessment) for the YNPS site, according to MCP regulations and

requirements, following remedial actions. As agreed to by the MassDEP, the Phase II investigation and Report were completed within the context of the MCP for the purposes of site closure, but not as a formal Release Tracking Number (RTN) for the entire site. The MassDEP is issuing this Review of the Final Phase II Report according to its authority under M.G.L. c. 21E and the regulations promulgated thereunder at 310 CMR 40.000.

The Final Phase II Reports submitted by Yankee in response to MassDEP's Interim Phase II Review included the reports outlined below (note that all documents associated with the YNPS site are public information and may be viewed or copied at the MassDEP Regional Office in Springfield, MA, or at the Yankee Public Document Repository in Greenfield, MA):

- Groundwater Monitoring Plan to Support Closure under the Massachusetts Contingency Plan, dated September 1, 2006;
- Supplemental Phase II Comprehensive Site Assessment Report, dated September 21, 2006, by ERM, Inc.;
- Human Health Risk Assessment Work Plan & Environmental Risk Characterization Work Plan, dated September 11, 2006, by Gradient Corp.;
- Revised Beneficial Use Determination (BUD) for Structures, dated November 6, 2006, by ERM, Inc.;
- Addendum to the Phase II Comprehensive Site Assessment Report, dated February 6, 2007, by ERM, Inc.;
- Method 3 Risk Characterization, dated November 2007, by Gradient Corp.;
- Response Action Outcome Statements, RTN 1-13411, dated February 25, 2008, by ERM, Inc.; and
- Post-Closure Maintenance and Monitoring Report, dated May 6, 2008 by MACTEC, Inc.

On June 9, 2007, MassDEP issued to Yankee the Revised Beneficial Use Determination (BUD) Permit approval (the BUD Permit) regarding the disposition of on-site structures and fill material within the historical Industrial Area of the plant site. As required, Yankee submitted to MassDEP a Groundwater Monitoring Plan, which was approved by MassDEP on June 19, 2007 (copy of approval attached).

The YNPS site was divided into three land areas for the purposes of assessment and remediation. These areas are:

- The Radiologically Controlled Area (RCA), which is approximately a 4-acre parcel immediately surrounding the former operating nuclear plant area;
- The Industrial Area, which is approximately a 13-acre parcel immediately surrounding the RCA, within the previous YNPS plant fence line, which formerly contained industrial structures associated with the plant; and
- The Non-Industrial Area, which is that portion of YNPS property outside the fenced Industrial Area, containing woodlands, roadways, etc., which encompasses approximately 1,783 acres, including surface water bodies adjacent to and downstream from YNPS site. The Southeast Construction Fill Area (SCFA) is just outside the previous Industrial Area, and has been assessed and remediated according to separate permit approvals from the MassDEP's Solid Waste Section.

The Interim Phase II Review contained a detailed summary of environmental assessment work performed as part of the Interim Phase II Report - that summary will not be repeated in this Review; however, a copy of the Interim Phase II Review is attached for reference. This Final Phase II Review will not summarize in detail the additional assessment results, but will address whether the requirements of the Interim Phase II review have been satisfactorily completed, for each of the environmental media assessed at the site. For each of the following review sections, the applicable conditions of the Interim Phase II Report requirements

are listed.

1. **Final Phase II Report – General** (Interim Ph. II Condition 14)

The cumulative Final Phase II Report contained the following information, as required:

- Summaries of additional assessment work, including analytical data (non-radiological and radiological) in tabular form, with appropriate standards or criteria for each media shown (for reference purposes);
- Updated basemaps, depicting the locations of soil sampling locations, groundwater monitoring wells, surface water and sediment sampling locations, and fish sampling locations;
- Groundwater contour maps of the Industrial Area and immediate vicinity, and updated maps of tritium concentrations in groundwater;
- Contour maps of the top of bedrock, top of till, and top of glaciolacustrine unit;
- Contour maps of gross alpha and gross beta activity in site groundwater monitoring wells;
- Historic summaries of Radiological Environmental Monitoring Program (REMP) monitoring performed prior to 1971;
- The ASTM Phase I BWSC (21E) assessment report for the Non-Industrial Area of the Facility; and
- Cumulative (radiological and non-radiological) Human Health and Ecological Stage II Risk Assessments for the YNPS site, prepared in accordance with approved Scopes-of-Work (SOWs), according to MassDEP regulations and requirements.

2. **Soil - Assessment** (Interim Ph. II Conditions 2, 3, 4 & 6)

Decommissioning activities within the Industrial Area resulted in the removal of substantial volumes of soil (and demolition material, including concrete rubble) for proper disposal as radiological waste at permitted off-site disposal facilities, according to NRC requirements. Soil remediation was also completed for non-radiological parameters within the Industrial Area, and in more limited amounts in the Non-Industrial Area. Confirmatory soil samples were obtained after remedial activities were completed. As required in the BUD Permit, following assessment and soil removal, a 3-foot thick layer of clean soil was placed over the entire, 3.5-acre BUD Fill Area, which encompasses the RCA at the center of the Industrial Area.

A total of approximately 2,700 soil samples have been obtained and analyzed for non-radiological parameters as part of the assessment of the YNPS site. The soil sampling required by the Interim Phase II Review was completed, both within the Industrial Area and in the Non-Industrial Area. All of these additional soil samples were analyzed at a minimum for the standard non-radiological parameter list for the YNPS site (as approved by MassDEP), which consists of all samples being analyzed for volatile organic compounds (VOCs) by EPA Method 8260 and the thirteen (13) Priority Pollutant metals by EPA Method 6010B, and selected additional samples being analyzed for various portions of the following parameter list:

- Semi-volatile organic compounds (SVOCs) by EPA Method 8270;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082;
- Extractable petroleum hydrocarbons/volatile petroleum hydrocarbons (EPH/VPH) by the MassDEP method;
- Dioxins and furans;
- Hydrazine;

- Pesticides; and
- Herbicides by EPA Method 8151.

The results of full radiological analyses for approximately 1,600 soil samples were utilized in the Risk Assessment review, including the specific additional soil sampling required by the Interim Phase II Review. A large amount of additional radiological monitoring and assessment of soils (and other media) was performed at the YNPS site to satisfy the NRC and MADPH requirements for the NRC License Partial Site Release, as part of the Final Status Survey (FSS) for the site.

All soil samples were analyzed for the presence of radionuclides by gamma spectroscopy, and as outlined in the LTP requirements, a minimum of 5% of these samples were also analyzed for the Hard-To-Detect (HTD) radionuclides H-3 (tritium), Am-241, C-14, Cm-243/244, Fe-55, Ni-63, Pu-238, Pu-239/240, Pu-241, Sr-90 and Tc-99. For all media samples, including soil, the radiological analyses by gamma spectroscopy at a minimum quantified the FSS list of radionuclides Ag-108m, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Nb-94 and Sb-125. The LTP states that these radionuclides are analyzed as part of the entire gamma spectroscopy library, and that if any other radionuclides were detected by gamma spectroscopy above minimum detectable activities (MDAs), they would have been reported as part of these analyses.

**Following remedial activities, the results of soil analyses (both radiological and non-radiological) do not exceed the risk criteria of the Risk Assessment.**

### **3. Groundwater - Assessment (Interim Ph. II Conditions 2, 3, 4, 7, 8, 9 & 10)**

A total of 83 groundwater monitoring wells have been installed and monitored at the site to date, including 22 wells installed in 2006 subsequent to (and, in part, in response to) the Interim Phase II Review. Due to decommissioning activities, 26 monitoring wells have been properly abandoned in accordance with MassDEP guidelines. Currently, there are a total of 57 monitoring wells on-site, consisting of shallow (water-table) wells, intermediate depth wells, and deep, bedrock wells. Groundwater flow maps show that groundwater flow beneath the previous Industrial Area is primarily towards the Deerfield River below Sherman Dam (towards the vicinity of Sherman Spring), with some indication of a minor amount of deeper, radial flow towards Sherman Reservoir.

Groundwater samples were analyzed for the standard YNPS non-radiological parameter list, and the additional samples required in the Interim Phase II Review were also analyzed for boron, as required. Several monitoring wells have historically shown limited exceedances of groundwater standards for non-radiological parameters, primarily for arsenic.

All groundwater samples were analyzed during at least four quarterly Phase II monitoring rounds for the presence of radionuclides by gamma spectroscopy, and also for the HTD radionuclides. All groundwater samples from all monitoring rounds were analyzed at a minimum for tritium, gross alpha and gross beta, and a significant number of selected monitoring wells have also been analyzed historically for the gamma spectroscopy and the HTD parameter list.

The former Visitors' Center potable well was sampled and analyzed for radiological analyses, and the results of the last two years of sampling and analysis of the YNPS Facility potable well were included in the Final Phase II Report. The results showed no exceedances of any MA Drinking Water Standards & Guidelines (MCLs), and no detectable tritium or other plant-related radionuclides.

The Final Phase II Report states that tritium continues to be the only plant-related radionuclide detected in

groundwater at YNPS site. The source of the tritium contamination in groundwater at the site was the result of a documented leak(s) in the former Spent Fuel Pool/Ion Exchange Pit complex (SFP/IXP complex) which began in the 1960s, within the center of the former Industrial Area/RCA. The tritium contamination in groundwater extends laterally downgradient from the former SFP/IXP complex location towards Sherman Spring and the Deerfield River, primarily in the shallow glaciolacustrine unit. The deeper tritium contamination is more limited in extent and concentrations, extending at depth into the sand layers within the glacial till and into bedrock in one well, MW-105B (within the former RCA), and extending laterally from the former SFP/IXP complex a shorter distance towards Sherman Reservoir.

The June 19, 2007 Post-Closure Groundwater Monitoring Plan approval issued to Yankee by MassDEP requires continued sampling of 4 monitoring wells and Sherman Spring, within and downgradient of the BUD Area, during the post-closure monitoring period of 30 years and includes analyses for the radionuclides by gamma spectroscopy, Sr-90 and tritium. Tritium monitoring is also required at 2 additional site monitoring wells, non-radiological monitoring is required at 4 additional site monitoring wells, and 30-year post-closure monitoring (radiological and non-radiological) is also required at 3 monitoring wells located at the SCFA.

During the most recent monitoring in March of 2008, tritium continued to be detected in 8 of the site monitoring wells, with the highest tritium concentration of 25,700 picoCuries/liter (pCi/l) in well MW-107C, an intermediate-level well screened at a depth of 27 to 32 feet immediately downgradient of the former SFP/IXP complex location (this has decreased from a concentration of 48,000 pCi/l in 2003 in this well). In 2008, tritium continued to be detected in bedrock monitoring well MW-105B, at 4,710 pCi/l (equivalent to 2003 levels), while the water sample from Sherman Spring was non-detectable (ND) for tritium (decreased from previous levels).

The groundwater sample from well MW-107C continues to exceed the USEPA drinking water criteria (MCL) of 20,000 pCi/L. However, as required by the BUD Permit, the recorded deed notification(s) for the BUD Area, which encompass this well location and the central area of groundwater tritium contamination, prohibits the installation or use of any water supply wells within the BUD Area. **Given the BUD Area deed restrictions and based on the remaining data outside the BUD Area, the results of groundwater analyses for both radiological and non-radiological parameters do not exceed the risk criteria of the Risk Assessment.**

#### **4. Surface Water - Assessment (Interim Ph. II Conditions 2, 3, 4, & 11)**

As part of the entire Phase II Assessment, a total of 126 surface water samples were collected from the site and surrounding vicinity, with samples collected from upstream (background) locations, Sherman Reservoir, the Deerfield River, Sherman Spring, the East and West Storm Drain Ditches, and in Wheeler Brook (as part of the SCFA assessment). Initial Phase II surface water samples were analyzed for the standard YNPS non-radiological parameter list and for radionuclides by gamma spectroscopy and for HTDs. All of the additional surface water samples required in the Interim Phase II Review were obtained as required and analyzed for the thirteen (13) Priority Pollutant metals plus lithium and boron, and for radionuclides by gamma spectroscopy plus tritium.

The additional surface water samples showed slightly elevated levels of some metals in Sherman Spring and the Deerfield River immediately downriver of the YNPS (adjacent to the Sherman Spring location, just below the Sherman Reservoir dam). Tritium was detected in Sherman Spring and the West Storm Drain Ditch in 2006. **The results of the surface water analyses for both radiological and non-radiological**

**parameters do not exceed the risk criteria of the Risk Assessment.**

**5. Sediment - Assessment (Interim Ph. II Conditions 2, 3, 4, & 11)**

As part of the entire Phase II Assessment, a total of approximately 700 sediment samples were collected from the site and surrounding vicinity, with samples generally collected from the same locations as surface water samples. Initial Phase II surface water samples were analyzed for the standard YNPS non-radiological parameter list and for radionuclides by gamma spectroscopy and for HTDs. All of the additional sediment samples required in the Interim Phase II Review were obtained as required and analyzed for the thirteen (13) Priority Pollutant metals plus lithium, boron and total uranium, and for radionuclides by gamma spectroscopy plus HTDs.

As part of decommissioning activities, PCB-contaminated sediments (from PCB-containing paints previously used at the YNPS) were remediated from Sherman Reservoir and the West Storm Drain Ditch in accordance with TSCA approvals from the EPA, as noted previously. Confirmatory sediment samples were obtained from these areas after remediation.

The additional sediment samples showed slightly elevated levels of some metals and some radionuclides (including Cs-137) in Sherman Spring, the Deerfield River immediately downriver of the YNPS (adjacent to the Sherman Spring location, just below the Sherman Reservoir dam), and in Sherman Reservoir at the Cooling Water Discharge embayment, immediately adjacent to the YNPS. Total uranium was slightly elevated in the Deerfield River immediately downriver of the YNPS (adjacent to the Sherman Spring location, just below the Sherman Reservoir dam). **The results of the sediment analyses for both radiological and non-radiological parameters do not exceed the risk criteria of the Risk Assessment.**

**6. Fish - Assessment (Interim Ph. II Conditions 2, 4, & 12)**

Fish were collected in the Summer/Fall of 2006 from background locations upriver at Harriman Reservoir; two locations within Sherman Reservoir (the East Storm Drain Outfall near the YNPS facility, and the northern end of Sherman Reservoir); and the Deerfield River immediately downriver of the YNPS facility, upriver of the Monroe Bridge dam. Fillets from the fish were analyzed for PCBs (both Aroclors and congeners), for radionuclides by gamma spectroscopy, and for tritium.

Fish samples from Sherman Reservoir showed slightly elevated levels of PCBs, relative to the background samples from Harriman Reservoir. Fish samples from Sherman Reservoir showed detectable, but very low levels of tritium, while the background samples from Harriman Reservoir and the samples from the Deerfield River were non-detectable for tritium. The Final Phase II Report concluded that the detectable levels of tritium were naturally-occurring and not related to YNPS plant operations. No other radionuclides were detected by gamma spectroscopy in the fish samples, except for naturally-occurring K-40. **The results of the fish analyses for both radiological and non-radiological parameters do not exceed the risk criteria of the Risk Assessment.**

**7. Risk Assessment – Results (Interim Ph. II Conditions 13 & 14)**

As required by the Phase II Interim Review, Yankee's consultant, Gradient Corp., submitted to MassDEP the Scopes-of-Work (SOWs) for cumulative (radiological and non-radiological) Human Health and



Ecological Stage II Risk Assessments (the Risk Assessment) for the YNPS site, according to the regulations, requirements and guidance as outlined in the MCP. The SOWS were approved by MassDEP's Office of Research & Standards (ORS) on December 6, 2006. The completed Method 3 Risk Characterization (the Risk Assessment) for the YNPS was submitted to MassDEP on November 13, 2007. **The Risk Assessment concludes that the YNPS site meets the MassDEP's Risk Assessment standards for cumulative risk attributable to the site (radiological and non-radiological) of no more than  $1 \times 10^{-5}$  Excess Lifetime Cancer Risk (ELCR) and no more than a Hazard Index (HI) of 1.**

USEPA/Region I provided assistance to MassDEP/ORS in the review of the Risk Assessment. The ORS review of the Risk Assessment was issued on December 31, 2007 (copy attached). **The ORS review memorandum states that the Risk Assessment is consistent with the risk assessment requirements of the MCP.**

The NRC's August 10, 2007 Partial Site Release issued in accordance with the YNPS License Termination Plan (LTP) concluded that the YNPS site meets the NRC approved Yankee Atomic Electric Company's LTP/FSS standard of no more than 25 millirem/year (mrem/yr) total radiation dose above background, or Total Effective Dose Equivalent (TEDE) attributable to the site. The MADPH's March 14, 2008 partial site release approval concluded that the YNPS site meets the MADPH standard of no more than 10 mrem/yr TEDE attributable to the site. Neither of these approvals required the placement of the 3-foot soil cover over the BUD Fill Area (the RCA) to meet these respective dose-based standards.

The MassDEP's approval of the Risk Assessment conclusions are contingent, in part, on the Deed Notices for the YNPS site, which contain the following requirements (among others) for 30-year post-closure maintenance and monitoring by Yankee:

- The continued maintenance of the three-foot layer of clean soil placed over the 3.5-acre BUD Fill Area in the central portion of the YNPS site, and the requirements for no excavations or other invasive procedures within that soil layer;
- The requirement that no potable water supply wells may be installed or used within the BUD Area; and
- The requirements for continued monitoring of the YNPS site, including the BUD Area and the SCFA.

Yankee recorded the Deed Notice for the SCFA on October 3, 2007, and the Deed Notice for the YNPS portion of the BUD Area on February 1, 2008, and TransCanada recorded the Deed Notice for the TransCanada portion of the BUD Area on June 27, 2008. Yankee executed Financial Assurance Mechanisms (FAMs) for the BUD Area on November 25, 2007, and for the SCFA on February 11, 2008, consisting of fully-funded Trust Funds in the monetary amounts approved by MassDEP, for 30-year post-closure maintenance and monitoring costs. As noted previously, the MassDEP's June 19, 2007 approval of the Groundwater Monitoring Plan requires long-term monitoring of the BUD Area and the SCFA.

## II. MASSDEP DETERMINATIONS

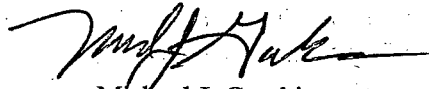
Personnel of the MassDEP have reviewed the Final Phase II Report for the YNPS in accordance with MGL c. 21E, the regulations promulgated thereunder at 310 CMR 40.0000 (the Massachusetts Contingency Plan, or the MCP), and applicable MassDEP policies and guidance. The MassDEP has determined that the Final Phase II Report is acceptable in accordance with MGL c. 21E and 310 CMR 40.0000, and that YNPS has achieved site closure under the MCP, subject to the conditions outlined below.

1. Yankee shall continue to comply with the requirements for post-closure maintenance and monitoring of the entire BUD Area (both the YNPS portion and the TransCanada portion of the BUD Area), as outlined in the MassDEP's Revised BUD Permit Approval, dated June 9, 2007.
2. Yankee shall continue to comply with all of the restrictions and requirements contained within the Deed Notice for the YNPS portion of the BUD area, as recorded on February 1, 2008, at the Franklin County Registry of Deeds, Book 5455, Page 320.
3. Yankee shall continue to comply with all of the restrictions and requirements contained within the Deed Notification for the SCFA, as recorded on October 3, 2007 at the Franklin County Registry of Deeds, Book 5401, Page 167.
4. Yankee shall continue to comply with the requirements for post-closure monitoring of the YNPS BUD Area (including the portion of the BUD Area on the TransCanada property) and the SCFA, as outlined in the MassDEP's approval of the Groundwater Monitoring Plan dated June 19, 2007, including the requirement for submittal of monitoring results to MassDEP within 45 days of the date of sampling. As outlined in the attached ORS Risk Assessment review memo, the metal thallium shall be added to the analytical parameter list for sampling of Sherman Spring as part of post-closure monitoring. **Yankee shall also perform the following surface water monitoring as part of the 30-year post-closure monitoring program:**
  - A. Surface water samples shall be collected at the following locations: (1) an upstream, background location where the Deerfield River enters Sherman Reservoir - former SW-408 location; (2) Sherman Reservoir - former SW-011 location; and (3) the Deerfield River just above the Monroe Dam;
  - B. These surface water samples shall be collected at the same frequency as the Sherman Spring water sample, as outlined in the MassDEP's approval of the Groundwater Monitoring Plan dated June 19, 2007, i.e. annually for 4 years, every 2 years for 6 years, and every 5 years for 20 years;
  - C. The surface water samples shall be analyzed for radionuclides by gamma spectroscopy, which shall at a minimum quantify the radionuclides Ag-108m, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Nb-94, and Sb-125. In addition, any other plant-related radionuclides detected by gamma spectroscopy above MDAs shall be reported as part of these analyses. The surface water samples shall also be analyzed for the Hard-To-Detect (HTD) radionuclides H-3 (tritium), and Sr-90;
  - D. The upstream, background surface water sample and the Sherman Reservoir surface water sample shall be analyzed for dissolved RCRA 8 metals;
  - E. Surface water sample results shall be submitted to MassDEP and copied to FRCOG within 45 days of the date of sampling; and

- F. The FAMs for post-closure monitoring costs at the YNPS BUD Area and SCFA will not be reduced during the 30-year post-closure monitoring period, unless such a reduction is approved in writing by MassDEP. Yankee shall continue to comply with the post-closure maintenance and monitoring requirements for the SCFA, as outlined in the October 31, 2008 SCFA Closure Certification permit approval from MassDEP.
5. Yankee shall continue to comply with all other applicable local, state and federal regulations and requirements, including those of the NRC, EPA, MADPH, and the Rowe Conservation Commission.
6. Appropriate Health & Safety (H&S) measures shall be utilized for all post-closure maintenance and monitoring work at the YNPS.

The MassDEP reserves the right to require additional investigatory or remedial work at the YNPS site, if continued monitoring results indicate such a need. If you should have any questions or comments regarding this correspondence please contact Larry Hanson (#413-755-2287) or David Howland (#413-755-2280) of this office.

Sincerely,



Michael J. Gorski  
Regional Director

YAEC-ph2final109(2)

cc: Joe Bourassa - Yankee Atomic Electric Company  
Robert Mitchell – Yankee Atomic Electric Company  
John McTigue – ERM, Inc.  
Rowe Board of Selectmen  
Rowe Board of Health  
Michael Whalen, MA DPH - Radiation Control Program  
~~John Hickman - Nuclear Regulatory Commission~~  
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