

Vermont Yankee Nuclear Power Station

Post Shutdown Decommissioning Activities Report

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**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

1.0	Introduction and Summary	1
1.1	Introduction	1
1.2	Background.....	1
1.3	Summary of Decommissioning Alternatives.....	3
2.0	Description of Planned Decommissioning Activities.....	6
2.1	Discussion of Decommissioning Periods.....	9
2.1.1	Preparations For Dormancy.....	9
2.1.2	Dormancy	12
2.1.3	Preparations for Decommissioning.....	13
2.1.4	Decommissioning	13
2.1.5	Site Restoration.....	15
2.2	General Decommissioning Considerations	15
2.2.1	Major Decommissioning Activities	15
2.2.2	Other Decommissioning Activities.....	16
2.2.3	Decontamination and Dismantlement Activities	16
2.2.4	Radioactive Waste Management	16
2.2.5	Removal of Mixed Wastes	17
2.2.6	Site Characterization.....	17
2.2.7	Groundwater Protection and Radiological Decommissioning Records Program ..	17
2.2.8	Changes to Management and Staffing	18
3.0	Schedule of Planned Decommissioning Activities	19
4.0	Estimate of Expected Decommissioning and Spent Fuel Management Costs	20
5.0	Environmental Impacts.....	21
5.1	Environmental Impact of VYNPS Decommissioning	21
5.1.1	Onsite/Offsite Land Use.....	21
5.1.2	Water Use.....	22
5.1.3	Water Quality	22
5.1.4	Air Quality.....	23
5.1.5	Aquatic Ecology	23
5.1.6	Terrestrial Ecology.....	24
5.1.7	Threatened and Endangered Species	25
5.1.8	Radiological.....	26
5.1.9	Radiological Accidents	27
5.1.10	Occupational Issues	28

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

5.1.11	Cost	28
5.1.12	Socioeconomics	29
5.1.13	Environmental Justice	29
5.1.14	Cultural, Historic, and Archeological Resources	30
5.1.15	Aesthetic Issues	31
5.1.16	Noise	31
5.1.17	Transportation.....	31
5.1.18	Irreversible and Irretrievable Commitment of Resources.....	32
5.2	Environmental Impacts of License Termination - NUREG-1496.....	33
5.3	Discussion of Decommissioning in the DSEIS	33
5.4	Additional Considerations	34
5.5	Conclusions	35
6.0	References.....	36
Table 2.1	Decommissioning Schedule Summary	8
Table 2.2	Decommissioning Cost Summary	9
Attachment 1: VYNPS Site-Specific Decommissioning Cost Estimate		
Attachment 2: Settlement Agreement between ENO, ENVY and State of Vermont		

Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report

Acronyms

AIF	Atomic Industrial Forum
ALARA	As Low As Reasonably Achievable
BMP	Best Management Practices
BWR	Boiling Water Reactor
CFR	Code of Federal Regulations
DCE	Decommissioning Cost Estimate
DOE	Department of Energy
DSEIS	Draft Supplemental Environmental Impact Statement (NUREG-1437)
ENO	Entergy Nuclear Operations, Inc.
ENVY	Entergy Vermont Yankee, LLC
EPA	Environmental Protection Agency
FSAR	Final Safety Analysis Report
GEIS	Generic Environmental Impact Statement (NUREG-0586)
GTCC	Greater than Class C
GW	Groundwater
ISFSI	Independent Spent Fuel Storage Installation
LLRW	Low-Level Radioactive Waste
LTP	License Termination Plan
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MWt	Megawatt-thermal
NEI	Nuclear Energy Institute
NESP	National Environmental Studies Project
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
PSDAR	Post-Shutdown Decommissioning Activities Report
SEIS	Generic Environmental Impact Statement for License Renewal of Nuclear Plants (NUREG-1437), Supplement 30 “Regarding Vermont Yankee Nuclear Power Station”
SFP	Spent Fuel Pool
SSCs	Structures, Systems and Components
UFSAR	Updated Final Safety Analysis Report
VTDEC	Vermont Department of Environmental Conservation
VYNPS	Vermont Yankee Nuclear Power Station

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

1.0 INTRODUCTION AND SUMMARY

1.1 Introduction

In accordance with the requirements of Title 10 of the Code of Federal Regulations (CFR) 50.82, “Termination of license,” paragraph (a)(4)(i), this report constitutes the Post-Shutdown Decommissioning Activities Report (PSDAR) for the Vermont Yankee Nuclear Power Station (VYNPS). This PSDAR contains the following:

1. A description of the planned decommissioning activities along with a schedule for their accomplishment.
2. A discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements.
3. A site-specific decommissioning cost estimate (DCE), including the projected cost of managing irradiated fuel and the post-decommissioning site restoration cost.
4. A settlement agreement between ENO, ENVY and the State of Vermont.

The PSDAR has been developed consistent with Regulatory Guide 1.185, “Standard Format and Content for Post-Shutdown Decommissioning Activities Report,” (Reference 1). This report is based on currently available information and the plans discussed herein may be modified as additional information becomes available or conditions change. As required by 10 CFR 50.82(a)(7), ENVY will notify the Nuclear Regulatory Commission (NRC) in writing, with copies sent to the affected State(s), before performing any decommissioning activity inconsistent with, or making any significant schedule change from, those actions and schedules described in the PSDAR, including changes that significantly increase the decommissioning cost.

1.2 Background

The VYNPS site is located in the town of Vernon, Vermont, in Windham County on the west shore of the Connecticut River immediately upstream of the Vernon Hydroelectric Station. VYNPS employs a General Electric boiling water reactor nuclear steam supply system licensed to generate 1,912 megawatts - thermal (Mwth). The current facility operating license for VYNPS expires at midnight, March 21, 2032. The principal structures at VYNPS include a reactor building, primary containment, control building, radwaste building, intake and discharge structures, turbine building, cooling towers and main stack.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

A brief history of the major milestones related to VYNPS construction and operational history is as follows:

- Construction Permit Issued: December 11, 1967
- Operating License Issued: March 21, 1972
- Commercial Operation: November 30, 1972
- Initial Operating License Expiration: March 21, 2012
- Renewed Operating License Expiration: March 21, 2032

By letter dated September 23, 2013 (Reference 2), ENO notified the NRC that it intended to permanently cease power operations of VYNPS at the end of the current operating cycle, which is expected to occur during the fourth quarter of 2014. ENO will submit a supplement to this letter certifying the date on which operations have ceased, or will cease, in accordance with 10 CFR 50.82(a)(1)(i) and 10 CFR 50.4(b)(8). Upon docketing of the certifications required by 10 CFR 50.82(a)(1)(i) and 10 CFR 50.82(a)(1)(ii), pursuant to 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for VYNPS will no longer authorize operation of the reactor or emplacement or retention of fuel in the reactor vessel.

Pursuant to 10 CFR 50.51(b), “Continuation of license,” the license for a facility that has permanently ceased operations continues in effect beyond the expiration date to authorize ownership and possession of the utilization facility until the Commission notifies the licensee in writing that the license has been terminated.

During the period that the license remains in effect, 10 CFR 50.51(b) requires that ENVY:

1. Take actions necessary to decommission and decontaminate the facility and continue to maintain the facility including storage, control, and maintenance of the spent fuel in a safe condition.
2. Conduct activities in accordance with all other restrictions applicable to the facility in accordance with NRC regulations and the 10 CFR 50 facility license.

10 CFR 50.82(a)(9) states that power reactor licensees must submit an application for termination of the license at least two years prior to the license termination date and that the application must be accompanied or preceded by a license termination plan to be submitted for NRC approval.

On December 23, 2013, Entergy Nuclear Vermont Yankee (ENVY), and Entergy Nuclear Operations (ENO) entered into a Settlement Agreement (the “Settlement Agreement”) with the Vermont Public Service Department (PSD), the Vermont Agency of Natural Resources (ANR), and the Vermont Department of Health (VDH), with the Vermont Office of the Attorney General and Entergy Corporation agreeing to certain provisions of that agreement. In the Settlement Agreement ENVY committed to reflect ENVY’s commitments in that agreement in the Vermont Yankee PSDAR and to include the Settlement Agreement with the PSDAR. The Settlement Agreement is provided as Attachment 2 of this PSDAR. The key commitments in the Settlement Agreement relevant to decommissioning, including site restoration after radiological decommissioning has been completed, are:

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

- To prepare and provide to PSD, ANR and VDH a site assessment study of the costs and tasks of radiological decommissioning, SNF management, and site restoration of the VY Station, including a prompt decontamination and dismantlement scenario and a full assessment of non-radiological conditions at the VY Station site;
- To review the site assessment study with PSD, ANR and VDH and to consider any comments from these agencies for inclusion in the PSDAR;
- To make appropriate filings with the NRC to obtain authority to begin radiological decommissioning within 120 days after ENVY has made a reasonable determination that the funds in the Nuclear Decommissioning Trust for the VY Station are adequate to complete decommissioning and remaining SNF management activities that the federal government has not yet agreed or been ordered to reimburse;
- Once NRC approval or non-opposition is received, to promptly commence, pursue and complete as soon as reasonably possible radiological decontamination and dismantlement activities;
- To acknowledge state jurisdiction over site restoration after radiological decommissioning is complete and to work in good faith with PSD, ANR and VDH to determine in a timely and cost effective manner overall site restoration standards (including removal of structures and level of radiological exposure) that are to be applicable after radiological decontamination has been completed to the satisfaction of the NRC, that are necessary to support use of the site property without limitation (excluding any ISFSI and perimeter related to it), and that do not include the demolition of above-grade decontaminated concrete into rubble that is buried on the site;
- To commence site restoration in accordance with agreed standards promptly after completing radiological decommissioning;
- To establish a trust specifically and solely dedicated to funding site restoration at the VY Station with deposits totaling \$25 million through 2017;
- To conduct all activities in Vermont, including at the VY Station site, in accordance with federal and state laws, including VDH's Radiological Health Rule;
- To agree to seek from NRC the release of portions of the site for reuse as appropriate.

1.3 Summary of Decommissioning Alternatives

The NRC has evaluated the environmental impacts of three general methods for decommissioning power reactor facilities in NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors," (GEIS) (Reference 3). The three general methods evaluated are summarized as follows:

- DECON: The equipment, structures and portions of the facility and site that contain radioactive contaminants are promptly removed or decontaminated to a level that permits termination of the license shortly after cessation of operations.
- SAFSTOR: After the plant is shut down and defueled, the facility is placed in a safe, stable condition and maintained in that state (safe storage). The facility is decontaminated and dismantled at the end of the storage period to levels that permit

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

license termination. During SAFSTOR, a facility is left intact or may be partially dismantled, but the fuel is removed from the reactor vessel and radioactive liquids are drained from systems and components and then processed. Radioactive decay occurs during the SAFSTOR period, thereby reducing the quantity of contamination and radioactivity that must be disposed of during decontamination and dismantlement.

- **ENTOMB:** Radioactive structures, systems and components (SSCs) are encased in a structurally long-lived substance, such as concrete. The entombed structure is appropriately maintained, and continued surveillance is carried out until the radioactivity decays to a level that permits termination of the license.

The decommissioning approach that has been selected by ENVY for VYNPS is the SAFSTOR method. The primary objectives of the VYNPS decommissioning project are to remove the facility from service, reduce residual radioactivity to levels permitting unrestricted release, restore the site, perform this work safely, and complete the work in a cost effective manner. The selection of a preferred decommissioning alternative is influenced by a number of factors at the time of plant shutdown. These factors include the cost of each decommissioning alternative, minimization of occupational radiation exposure, availability of low-level waste disposal facilities, availability of a high-level waste (spent fuel) repository or a Department of Energy (DOE) interim storage facility, regulatory requirements, and public concerns. In addition, 10 CFR 50.82(a)(3) requires decommissioning to be completed within 60 years of permanent cessation of operations¹.

Under the SAFSTOR methodology, the facility is placed in a safe and stable condition and maintained in that state allowing levels of radioactivity to decrease through radioactive decay, followed by decontamination and dismantlement. After the safe storage period, the facility will be decontaminated and dismantled to levels that permit license termination. In accordance with 10 CFR 50.82(a)(9), a license termination plan will be developed and submitted for NRC approval at least two years prior to termination of the license.

The decommissioning approach for VYNPS is described in the following sections.

- Section 2.0 describes the planned decommissioning activities and the general timing of their implementation.
- Section 3.0 describes the overall decommissioning schedule, including the spent fuel management activities.
- Section 4.0 provides an analysis of expected decommissioning costs, including the costs associated with spent fuel management and site restoration.

¹ As noted in section 3.0, "ENVY intends to pursue the decommissioning of VYNPS utilizing a SAFSTOR methodology subject to its commitment in the Settlement Agreement (Attachment 2) to make appropriate filings with the NRC to obtain authority to begin radiological decommissioning within 120 days after ENVY has made a reasonable determination that the funds in the Nuclear Decommissioning Trust for the VY Station are adequate to complete decommissioning and remaining SNF management activities that the federal government has not yet agreed or been ordered to reimburse. "

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

- Section 5.0 describes the basis for concluding that the environmental impacts associated with decommissioning VYNPS are bounded by the NRC generic environmental impact statement related to decommissioning.
- Section 6.0 is a list of references.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

2.0 DESCRIPTION OF PLANNED DECOMMISSIONING ACTIVITIES

ENVY is currently planning to decommission VYNPS using a SAFSTOR method. SAFSTOR is broadly defined in Section 1.3 of this report. Use of the SAFSTOR method will require the management of spent fuel because of the DOE's failure to perform its spent fuel removal obligations under its contract with ENVY. To explain the basis for projecting the cost of managing SNF, a discussion of spent fuel management activities for the site is included herein.

The initial decommissioning activities to be performed after plant shutdown will entail preparing the plant for a period of safe-storage (also referred to as dormancy). This will entail de-fueling the reactor and transferring the fuel into the spent fuel pool, draining of fluids and de-energizing systems, and reconfiguring the electrical distribution, ventilation, heating, and fire protection systems. Systems temporarily needed for continued operation of the spent fuel pool will be reconfigured for operational efficiency. An additional ISFSI pad will be added, in close proximity to the existing ISFSI pad, to expand the ISFSI and allow for dry storage of all spent fuel assemblies and GTCC waste generated during the plant operations.

During dormancy the VYNPS will be staffed with personnel that will monitor, maintain and provide security for the ISFSI and plant facilities. Staffing and configuration requirements are expected to change during the period of dormancy, principally dependent upon the status of the spent fuel being stored on-site. This can be characterized as one of three spent fuel conditions, as follows:

- Wet and dry storage of spent fuel
- On-site dry storage of all spent fuel
- All spent fuel removed from the site

Spent fuel will remain in the spent fuel pool (SFP) until it meets the criteria for transfer, the existing ISFSI is expanded and the spent fuel can be transferred in an efficient manner to the expanded ISFSI. After all fuel has been transferred to the ISFSI, the pool and supporting systems will be in a drained and de-energized condition for the remainder of the dormancy period. The spent fuel will be stored in the ISFSI until transfer to the Department of Energy (DOE).

After the final spent fuel transfer to the ISFSI, the plant will remain in dormancy until the start of dismantling and decontamination (D&D) activities. D&D activities will be scheduled to commence in accordance with the commitments regarding the commencement of radiological decommissioning in the Settlement Agreement and to enable the license to be terminated within 60 years after permanent cessation of operations². Following completion of the D&D activities and termination of the NRC license, site restoration will be performed in accordance with the commitments in the Settlement Agreement.

For the purposes of a current decommissioning cost estimate, it is assumed that remaining structures are to be demolished to three-feet below grade and the excavations backfilled.

² Ibid., p.4

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

Decommissioning activities will be performed in accordance with written, reviewed and approved site procedures. There are no identified or anticipated decommissioning activities that are unique to the VYNPS site outside the bounds considered in the GEIS.

Radiological and environmental programs will be maintained throughout the decommissioning process to ensure occupational, public health and safety, and environmental compliance. Radiological programs will be conducted in accordance with the facility's revised Technical Specifications, Operating License, Updated Final Safety Analysis Report (UFSAR), Radiological Environmental Monitoring Program, and the Offsite Dose Calculation Manual. Non-radiological Environmental Programs will be conducted in accordance with applicable requirements and permits.

Tables 2-1 and 2-2 provide summaries of the schedule / plant status and costs for decommissioning VYNPS. The major decommissioning activities and the general sequence of activities are discussed in more detail in the sections that follow.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

**Table 2.1
Decommissioning Schedule and Plant Status Summary**

Decommissioning Activities / Plant Status	Start	End	Approximate Duration (years)
Pre-Shutdown Planning	August 2013	December 2014	1.3
Transition from Operations			
Plant Shutdown	December 29, 2014	-----	-----
Preparations for SAFSTOR Dormancy	December 29, 2014	April 30, 2016	1.3
SAFSTOR Dormancy³			
Dormancy w/Wet Fuel Storage	2016	2021	5.2
Dormancy w/Dry Fuel Storage	2021	2052	31.5
Dormancy w/No Fuel Storage	2052	2068	15
Preparations for Dismantling & Decontamination (D&D)³			
Preparations for D&D	2068	2069	1.5
Dismantling & Decontamination (D&D)³			
Large Component Removal	2069	2070	1.3
Plant Systems Removal and Building Decontamination	2070	2073	2.5
License Termination	2073	2073	0.7
Site Restoration³			
Site Restoration	2073	2075	1.5
Total from Shutdown to Completion of License Termination	-----	-----	59

³ “Subject to the commitments regarding the commencement of radiological decommissioning in the Settlement Agreement (Section 1.2).”

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

**Table 2.2
Decommissioning Cost Summary
(Thousands of 2014 dollars)**

Decommissioning Periods	License Termination	Spent Fuel Management	Site Restoration
Planning and Preparations	\$119,981	\$23,069	na
Dormancy w/Wet Fuel Storage	\$45,746	\$217,244	na
Dormancy w/Dry Fuel Storage	\$137,229	\$128,034	na
Dormancy w/No Fuel Storage	\$54,016	na	na
Site Reactivation	\$43,277	na	\$578
Decommissioning Preparation	\$36,283	na	\$456
Large Component Removal	\$141,032	na	\$25
Plant Systems Removal and Building Remediation	\$208,167	na	\$4,118
License Termination	\$30,668	na	na
Site Restoration	\$823	na	\$51,968
Total ^[a]	\$817,219	\$368,347	\$57,145

^[a] Columns may not add due to rounding

2.1 Discussion of Decommissioning Activities

The following narrative describes the basic activities associated with decommissioning the VYNPS. The site specific DCE (detailed in Attachment 1) is divided into phases or periods based upon major milestones within the project or significant changes in the annual projected expenditures. The following sub-sections correspond to the five major decommissioning periods within the estimate.

2.1.1 Preparations For Dormancy:

The NRC defines SAFSTOR as, “A method of decommissioning in which a nuclear facility is placed and maintained in a condition that allows the facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use.” The facility is left intact (during the dormancy period), with structures maintained in a stable condition. Systems that are not required to support the spent fuel, HVAC, Emergency Plan or site security are drained, de-energized, and secured. Minimal cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination is performed. Access to

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

contaminated areas is maintained secure to provide controlled access for inspection and maintenance.

The process of placing the plant in safe-storage will include, but is not limited to, the following activities:

- Creation of an organizational structure to support the decommissioning plan and evolving emergency planning and site security requirements.
- Revision of technical specifications, plans and operating procedures appropriate to the operating conditions and requirements.
- Characterization of the facility and major components as may be necessary to plan and prepare for the dormancy phase.
- Isolation of the spent fuel pool and reconfiguring fuel pool support systems so that draining and de-energizing may commence in other areas of the plant.
- Design and construction of an ISFSI pad expansion.
- Deactivation (de-energizing and /or draining) of systems that are no longer required during the dormancy period.
- Processing and disposal of water and water filter and treatment media not required to support dormancy operation.
- Disposition of incidental waste that may be present prior to the start of the dormancy period, such as excess tools and equipment and waste produced while deactivating systems and preparing the facility for dormancy.
- Reconfiguration of power, lighting, heating, ventilation, fire protection, and any other services needed to support long-term storage and periodic plant surveillance and maintenance.
- Stabilization by fixing or removing loose incidental surface contamination to facilitate future building access and plant maintenance. Decontamination of high-dose areas is not anticipated.
- Performance of interim radiation surveys of the plant, posting caution signs and establishing access requirements, where appropriate.
- Maintenance of appropriate barriers for contaminated and radiation areas.
- Reconfiguration of security boundaries and surveillance systems, as required.

The following is a general discussion of the planned reconfiguration expected after plant shutdown.

Electrical Systems

The electrical system will undergo a series of reconfigurations between shutdown and the time all spent fuel has been transferred to dry storage. The reconfigurations will be performed to reduce operating and maintenance expenses, while maintaining adequate power for station loads,

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

and backup power for Spent Fuel Pool-related systems and critical security equipment. The expansion of the ISFSI pad requires the removal of a diesel generator currently located where the ISFSI expansion will be built which supports security and other plant equipment. In connection with the expansion a new diesel generator (DG) unit and a new Uninterruptable Power Supply (UPS) unit will be installed.

Mechanical Systems

Following shutdown, as applicable, fluid filled systems will be drained and abandoned, and resins removed based on an evaluation of system category, functionality, and plant configuration. System categories include: 1) Balance of Plant (BOP), 2) Emergency Core Cooling System (ECCS), 3) Nuclear Steam Safety System (NSSS), 4) Spent Fuel Pool Cooling (SFPC), and 5) Dry Fuel Storage (DFS). Plant configurations include: 1) Post-shutdown (fuel in the reactor), 2) Post-defuel (no fuel in the reactor); 3) Post-gates in (no fuel in reactor, spent fuel pool is physically isolated from the reactor); 4) Reactor vessel drained; 5) Reduced risk of zirconium fire (spent fuel is in the spent fuel pool); and 6) Post-dry fuel storage (all spent fuel in dry fuel storage). The plant configuration and functionality of each system within the plant configuration as it evolves will determine when a system can be drained and abandoned.

Ventilation and Heating Systems

Ventilation will be reconfigured for the Turbine Building (TB) and Reactor Building (RB) to support remaining systems and habitability. Fluid filled systems in the TB will either be drained or freeze protection installed, and the heating steam secured. The RB ventilation system will be reconfigured to maintain building temperature to support habitability and the functioning of Fuel Pool Cooling systems, Fire Protection systems, and Dry Fuel Storage systems. RB ventilation to the stack will be maintained.

Fire Protection Systems

Fire Protection (FP) systems will be reconfigured based on a fire hazards analysis. The fire hazards analysis provides a comprehensive evaluation of the facility's fire hazards, the fire protection capability relative to the identified hazards, and the ability to protect spent fuel and other radioactive materials from potential fire-induced releases. The fire hazards analysis will be reevaluated and revised as necessary to reflect the unique or different fire protection issues and strategies associated with decommissioning. It is expected that as the plant's systems are drained and the combustible loading footprint shrinks, the FP requirements will be reduced.

Maintenance of Systems Critical to Decommissioning

It has been determined that there are no mechanical systems that will be critical to the final decommissioning process. As such, mechanical systems will be abandoned after all spent fuel has been transferred to Dry Fuel Storage, with the exception of systems required to maintain habitability during dormancy. The site power distribution system will be abandoned with the possible exception of Motor Control Centers that are required to support ventilation and lighting.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

The ISFSI pads and security will have a stand-alone power system (off-site feed backed up by a diesel generator.)

The organization responsible for the final dismantlement will be expected to establish temporary services, including electrical and cranes.

2.1.2 Dormancy

Activities required during the early dormancy period while spent fuel is stored in the fuel pool will be substantially different than those activities required during dry fuel or no fuel storage.

Early activities include operating and maintaining the spent fuel pool and its associated systems, expanding the ISFSI, and transferring spent fuel from the pool to the ISFSI. Assuming the timely receipt of the required state regulatory approvals, the ISFSI expansion is estimated to be completed in 2017. Spent fuel transfer is expected to be complete by late 2020. After the fuel transfer is completed, the pool and systems will be drained and de-energized for long-term storage.

Dormancy activities will include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, freeze protection heating, ventilation of buildings for periodic habitability, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. A fire protection program will be maintained.

Security during the dormancy period will be conducted primarily to safeguard the spent fuel on site and prevent unauthorized entry. A security barrier, sensors, alarms, and other surveillance equipment will be maintained as required to provide security.

An environmental surveillance program will be carried out during the dormancy period to monitor for radioactive material in the environment. Appropriate procedures will be established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program will consist of a version of the program in effect during normal plant operations that will be modified to reflect the plant's conditions and risks at the time.

Late in dormancy, activities will include transferring the spent fuel from the ISFSI to the DOE. For planning purposes, ENVY's current spent fuel management plan for the VYNPS spent fuel is based, in general, upon the following projections: 1) a 2025 start date for the DOE initiating transfer of commercial spent fuel to a federal facility, 2) a corresponding 2026 date for beginning to remove spent fuel from VYNPS, and 3) a 2052 completion date for removal of all VYNPS spent fuel. Transfer could occur earlier if the DOE is successful in implementing its current strategy for the management and acceptance of spent fuel. The ISFSI pad and facilities will be decommissioned at the time of plant decommissioning or after DOE has removed all spent fuel from the site.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

2.1.3 Preparations for Decommissioning

Assuming a 2 percent real rate of return on the NDT balance, VYNPS would be expected to have to remain in safe-storage dormancy while sufficient funds accumulate to complete decommissioning and SNF management activities until ~ mid-2060s, at which time preparations for decommissioning would commence. Assuming the NDT balance grows at a higher rate as it has historically, ENVY will seek authority from the NRC to commence preparations for decommissioning and to begin D&D activities sooner in accordance with ENVY's commitments regarding the commencement of radiological decommissioning in the Settlement Agreement. The duration of safe-storage dormancy period will depend on the available financial resources, projected fund growth and the cost to complete decommissioning and plant dismantlement as well as remaining SNF management costs that will not be reimbursed by DOE.

Prior to the commencement of decommissioning operations, preparations will be undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a site characterization, and the assembly of a decommissioning management organization. This would likely include the development of work plans, specifications and procedures.

2.1.4 Decommissioning (Dismantling and Decontamination)

Following the preparations for decommissioning, physical decommissioning activities will take place. This includes the removal and disposal of contaminated and activated components and structures, leading to the termination of the 10 CFR 50 operating license. Although much of the radioactivity will decrease during the dormancy period due to decay of ^{60}Co and other short-lived radionuclides, the internal components of the reactor vessel will still exhibit radiation dose rates that will likely require remote sectioning under water due to the presence of long-lived radionuclides such as ^{94}Nb , ^{59}Ni , and ^{63}Ni . Portions of the biological shield wall may also be radioactive due to the presence of activated trace elements with longer half-lives (such as ^{152}Eu and ^{154}Eu). It is assumed that radioactive contamination on structures, systems, and component surfaces will not have decayed to levels that will permit unrestricted release. These surfaces will be surveyed and items dispositioned in accordance with the existing radioactive release criteria.

Significant decommissioning activities in this phase include:

- Reconfiguration and modification of site structures and facilities, as needed, to support decommissioning operations. Modifications may also be required to the reactor or other buildings to facilitate movement of equipment and materials, support the segmentation of the reactor vessel and reactor vessel internals, and for large component removal.
- Design and fabrication of temporary and longer-term shielding to support removal and transportation activities, construction of contamination control envelopes, and the procurement of specialty tooling.
- Procurement or leasing of shipping cask, cask liners, and industrial packages for the disposition of low-level radioactive waste (LLRW).

Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report

- Decontamination of components and piping systems, as required, to control (minimize) worker exposure.
- Disposition of the turbine, condenser, main steam piping, and associated equipment; with appropriate dispositioning based upon radiological surveys.
- Disposition of systems and components.
- Removal of the recirculation pumps and associated piping for controlled disposal.
- Contaminated material will be characterized and segregated for additional offsite processing (disassembly, chemical cleaning, volume reduction, and waste treatment), and/or packaged for controlled disposal at a low-level radioactive waste disposal facility.
- Disposition of control rod blades.
- Disassembly and segmentation of the reactor vessel internals. This will likely involve use of remotely operated equipment within the reactor cavity, covered with a contamination control envelope. The cavity water level will likely need to be maintained just below the cut to maintain the working area dose rates ALARA. Some of this material may exceed Class C disposal requirements. This will be packaged for transfer to the DOE.
- Segmentation of the reactor vessel. Similar to the internals some of this work may involve the use of remotely operated equipment.
- Removal of the steel liners from the drywell, torus, refueling pool and spent fuel pool, disposing of the activated and/or contaminated sections as radioactive waste.
- Disposition of the activated and contaminated portions of the concrete biological shield and contaminated concrete surfaces that exceed the material release criteria.
- Material likely to be free of contamination may be surveyed and released for unrestricted disposition, e.g., as scrap, recycle, or general disposal, or sent to an off-site NRC / Agreement State licensed processor for radiological evaluation and appropriate disposition.
- Remediation of contaminated surface soil or sub-surface media will be performed as necessary to meet the unrestricted use criteria in 10 CFR 20.1402.
- Underground piping (or similar items) and associated soil will be removed as necessary to meet license termination criteria.

At least two years prior to the anticipated date of license termination, a License Termination Plan (LTP) will be submitted to the NRC. That plan will include: a site characterization, description of the remaining dismantling / removal activities, plans for remediation of remaining radioactive materials, developed site-specific Derived Concentration Guideline Levels (DCGLs), plans for the final status (radiation) survey (FSS), designation of the end use of the site, an updated cost estimate to complete the decommissioning, and associated environmental concerns.

The FSS plan will identify the radiological surveys to be performed once the decontamination activities are completed and will be developed using the guidance provided in the “Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).” This document incorporates statistical approaches to survey design and data evaluation. It also identifies state-of-the-art, commercially available instrumentation and procedures for conducting radiological surveys. Use

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the FSS is complete, the results will be submitted to the NRC, along with a request for termination of the NRC license.

Per the Settlement Agreement with the State of Vermont (Attachment 2), ENVY may release unaffected portions of the site on a partial site release basis, as they become available, before all site decommissioning work has been completed.

2.1.5 Site Restoration

After the NRC terminates the license, site restoration activities will be performed. Subject to the development of site restoration standards pursuant to the Settlement Agreement, ENVY currently assumes that remaining clean structures will be removed to a nominal depth of three feet below the surrounding grade level. Affected area(s) would then be backfilled with suitable fill materials, graded, and appropriate erosion controls established.

Non-contaminated concrete rubble produced by the demolition activities will be transported to an offsite area for appropriate disposal as construction debris.

2.2 General Decommissioning Considerations

2.2.1 Major Decommissioning Activities

As defined in 10 CFR 50.2, “definitions,” a “major decommissioning activity” is “any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components for shipment containing greater than class C waste in accordance with § 61.55.” The following discussion provides a summary of the major decommissioning activities currently planned for VYNPS. These activities are envisioned to occur in Dismantling and Decontamination Period. The schedule may be modified as conditions dictate.

Prior to starting a major decommissioning activity, the affected components will be surveyed and decontaminated, as required, in order to minimize worker exposure, and a plan will be developed for the activity. Shipping casks and other equipment necessary to conduct major decommissioning activities will be procured.

The initial major decommissioning activity inside the reactor building will be the removal, packaging, and disposal of systems and components attached to the reactor.

Following reactor vessel and cavity re-flood, the reactor vessel internals will be removed from the reactor vessel and segmented, if necessary, for packaging, transport and disposal, or to separate greater than Class C (GTCC) waste. Internals classified as GTCC waste will be segmented and packaged into containers similar to spent fuel canisters for transfer to the DOE. Removal of the reactor vessel follows the removal of the reactor internals. While industry experience indicates that there may be several options available for the removal and disposal of

Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report

the reactor vessel (i.e., segmentation or disposal as an intact package) intact removal may not be a viable option due to transportation size and weight restrictions. If segmented it is likely that the work would be performed remotely in-air, using a contamination control envelope.

Other major decommissioning activities that would be conducted include the removal and disposal of the turbine, condenser, recirculation pumps, main steam piping, feed water piping, pumps and heaters, liners (from the spent fuel pool, drywell and reactor cavity), the torus, spent fuel storage racks and neutron activated / contaminated concrete materials. The disposition of the drywell structure would be undertaken as part of the reactor building demolition.

2.2.2 Other Decommissioning Activities

In addition to the reactor and large components discussed above, all other plant components will be removed from the Reactor, Turbine and associated buildings, radiologically surveyed and dispositioned appropriately.

2.2.3 Decontamination and Dismantlement Activities

The overall objective of D&D is to ensure that radioactively contaminated or activated materials will be removed from the site to allow the site to be released for unrestricted use. This is achieved by radioactive decay during the SAFSTOR period which will significantly reduce the quantity of contamination and radioactivity that must be disposed of during decontamination and dismantlement. The disposition of remaining radioactive materials will be accomplished by the decontamination and/or dismantlement of contaminated structures. This may be accomplished by decontamination in place, off-site processing of the materials, or direct disposal of the materials as radioactive waste. A combination of these methods may be utilized. The methods chosen will be those deemed most appropriate for the particular circumstances.

Low-level radioactive waste (LLRW) will be managed in accordance with approved procedures and commercial disposal facility requirements. This includes characterizing contaminated materials, packaging, transporting and disposal at a licensed LLRW disposal facility.

2.2.4 Radioactive Waste Management

A major component of the decommissioning work scope for VYNPS is the packaging, transportation and disposing of primarily contaminated / activated equipment, piping, concrete, and soil. A waste management plan will be developed to incorporate the most cost effective disposal strategy, consistent with regulatory requirements and disposal / processing options for each waste type at the time of the D&D activities. Being located in Vermont, the VYNPS is subject to the Texas-Vermont waste compact agreement. As such, VYNPS wastes may be disposed of at the Waste Control Specialists site in Andrews County, Texas. If out of compact or other licensed LLRW facilities become available in the future, ENVY may apply for export permits to use them. LLRW from VYNPS will be transported by licensed transporters. The waste management plan will be based on the evaluation of available methods and strategies for processing, packaging, and transporting radioactive waste in conjunction with the available disposal facility options and associated waste acceptance criteria.

Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report

2.2.5 Removal of Mixed Wastes

If mixed wastes are generated they will be managed in accordance with applicable Federal and State regulations.

Mixed wastes from VYNPS will be transported by authorized and licensed transporters and shipped to authorized and licensed facilities. If technology, resources, and approved processes are available, the processes will be evaluated to render the mixed waste non-hazardous.

2.2.6 Site Characterization

During the decommissioning process, site characterization will be performed in which radiological, regulated, and hazardous wastes will be identified, categorized, and quantified. Surveys will be conducted to establish the contamination and radiation levels throughout the plant. This information will be used in developing procedures to ensure that hazardous, regulated, and radiologically contaminated areas are remediated and to ensure that worker exposure is controlled. As decontamination and dismantlement work proceeds, surveys will be conducted to maintain a current site characterization and to ensure that decommissioning activities are adjusted accordingly.

As part of the site characterization process, a neutron activation analysis calculation study of the reactor internals, the reactor vessel, and the biological shield wall was performed. Using the results of this analysis (along with benchmarking surveys), neutron irradiated components will be classified (projected for the future D&D time-frame) in accordance with 10 CFR 61, "Licensing requirements for land disposal of radioactive waste." The results of the analysis will form the basis of the plans for removal, segmentation, packaging and disposal.

2.2.7 Groundwater Protection and Radiological Decommissioning Records Program

A groundwater (GW) protection program currently exists at VYNPS in accordance with the Nuclear Energy Institute (NEI) Technical Report 07-07, "Industry Groundwater Protection Initiative - Final Guidance Document." A site hydrology study was completed as part of this initiative. 30 GW monitoring wells were installed around the plant to identify any leakage and transport of radiological contaminants. Measurable amounts of tritium, attributed to a line leak, were detected in some of the GW monitoring wells samples collected from late in the year 2009 until the present time. These positive detections were in samples collected from wells located on the east side of the plant. Historically, GW monitoring well GZ-15 had registered the highest levels of tritium. As of August, 2014, however, GZ-14d had the highest concentration (measured at 11,714 pCi/ L). All of the other groundwater wells were well below this value and less than the 20,000 pCi/L drinking water limit for tritium in 40 CFR 141.66. This measured tritium concentration in monitoring well GZ-14d corresponds to approximately 59% of the EPA drinking water limit.

Given this concentration and a half-life of 12.3 years, no tritium remediation is expected to be required at the end of the SAFSTOR period. The GW protection program is directed by procedures and will continue during decommissioning.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

ENVY will also continue to maintain the existing radiological decommissioning records program required by 10 CFR 50.75(g). The program is directed by procedures. None of the events noted in 10 CFR 50.75(g) indicate the presence of long-lived radionuclides in sufficient concentrations to preclude unrestricted release under 10 CFR 20.1402, "Radiological criteria for unrestricted use," at the end of the SAFSTOR period.

2.2.8 Changes to Management and Staffing

Throughout the decommissioning process, plant management and staffing levels will be adjusted to reflect the ongoing transition of the site organization. Staffing levels and qualifications of personnel used to monitor and maintain the plant during the various periods after plant shutdown will be subject to appropriate Technical Specification and Emergency Plan requirements. These staffing levels do not include contractor staffing which would likely be used to carry out the future fuel movements, plant modifications in preparation for SAFSTOR, and the D&D / license termination / site restoration work. Contractors may also be used to provide general services, staff augmentation or replace permanent staff. The monitoring and maintenance staff will be comprised of radiation protection, REMP, plant engineering and craft workers as appropriate for the anticipated work activities.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

3.0 SCHEDULE OF PLANNED DECOMMISSIONING ACTIVITIES

ENVY intends to pursue the decommissioning of VYNPS utilizing a SAFSTOR methodology subject to its commitment in the Settlement Agreement (Attachment 2) to make appropriate filings with the NRC to obtain authority to begin radiological decommissioning within 120 days after ENVY has made a reasonable determination that the funds in the Nuclear Decommissioning Trust for the VY Station are adequate to complete decommissioning and remaining SNF management activities that the federal government has not yet agreed or been ordered to reimburse. The SAFSTOR method involves removal of radioactively contaminated or activated material from the site following an extended period of dormancy. Work activities associated with the planning and preparation period began before the plant was permanently shut down and will continue into 2016. The schedule of spent fuel management and major decommissioning activities is provided in Table 2-1. Additional detail is provided in Attachment 1, the DCE.

The schedule accounts for spent fuel being stored in the ISFSI until the assumed date of transfer to the DOE.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

**4.0 ESTIMATE OF EXPECTED DECOMMISSIONING AND SPENT FUEL
MANAGEMENT COSTS**

10 CFR 50.82(a)(4)(i) requires the submission of a PSDAR within two years following permanent cessation of operations that contains a site-specific DCE, including the projected cost of managing irradiated fuel.

TLG Services, Inc. has prepared a site-specific decommissioning cost analysis for VYNPS, which also provides projected costs of managing spent fuel, as well as non-radiological decommissioning and site restoration costs, accounted for separately. The site-specific DCE is provided in Attachment 1 and fulfills the requirements of 10 CFR 50.82(a)(4)(i) and 10 CFR 50.82(a)(8)(iii). A summary of the site-specific DCE, including the projected cost of managing spent fuel is provided in Table 2-2. The site-specific DCE, from which this table was derived, is provided as Attachment 1.

The methodology used by TLG Services, Inc. to develop the site-specific DCE follows the basic approach originally advanced by the Atomic Industrial Forum (AIF) in its program to develop a standardized model for decommissioning cost estimates. The results of this program were published as AIF/NESP-036, "A Guideline for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," (Reference 4). The AIF document presents a unit cost factor method for estimating direct activity costs, simplifying the estimating process. The unit cost factors used in the study reflect the latest available data, at the time of the study, concerning worker productivity during decommissioning.

Under NRC regulations (10 CFR § 50.82(a)(8)), a licensee must provide reasonable assurance that funds will be available (or "financial assurance") for decommissioning (i.e., license termination) costs. The regulations also describe the acceptable methods a licensee can use to demonstrate financial assurance. Most licensees do this by funding a nuclear decommissioning trust (NDT). The NRC methodology limits the projected growth rate of the funds in the NDT to 2% per year (real, not nominal).

ENVY uses an NDT for this purpose. The trust was transferred with the liability as part of the sale transaction when Entergy acquired the plant. The trustee is Mellon Bank, N.A. The trust had a balance of \$653 million as of the end of August 2014.

10 CFR 50.82(a)(6)(iii) states that, "Licensees shall not perform any decommissioning activities," as defined in 10 CFR 50.2 that, "Result in there no longer being reasonable assurance that adequate funds will be available for decommissioning." ENVY does not intend to perform any decommissioning activities that result in there no longer being reasonable assurance that adequate funds will be available for decommissioning.

10 CFR 50.82(a)(8)(iv) states that, "For decommissioning activities that delay completion of decommissioning by including a period of storage or surveillance, the licensee shall provide a means of adjusting cost estimates and associated funding levels over the storage or surveillance period." Consistent with Regulatory Guide 1.159 (Reference 5), ENVY will update the VYNPS DCE as required.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

5.0 ENVIRONMENTAL IMPACTS

ENVY has concluded that the environmental impacts associated with planned VYNPS site-specific decommissioning activities are less than and bounded by the impacts addressed by previously issued environmental impact statements. 10 CFR 50.82(a)(4)(i) requires that the PSDAR include, "...a discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements." The following discussion provides the reasons for reaching this conclusion and is based on two previously issued environmental impact statements:

1. NUREG-0586, Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors (Reference 6) (Referred to as the GEIS).
2. NUREG-1496, Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities (Reference 7).

In evaluating whether the impacts in these previously issued environmental impact statements are bounding, information from NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 30, Regarding Vermont Yankee Nuclear Power Station (Reference 8) was also considered.

5.1 Environmental Impact of VYNPS Decommissioning

The following is a summary of the reasons for reaching the conclusion that the environmental impacts of decommissioning Vermont Yankee Nuclear Power Station (VYNPS) are bounded by the GEIS. Each environmental impact standard in the GEIS is listed along with an explanation as to why ENVY concludes the GEIS analysis bounds the impacts of VYNPS decommissioning on that standard. As a general matter, VYNPS is smaller than the reference boiling water reactor used in the GEIS to evaluate the environmental impacts of decommissioning, and is therefore bounded by those assessments. Further, no unique site-specific features or unique aspects of the planned decommissioning have been identified.

5.1.1 Onsite/Offsite Land Use

Section 4.3.1 of the GEIS concluded that the impacts on land use are not detectable or small for facilities having only onsite land use changes as a result of large component removal, structure dismantlement, and low-level waste packaging and storage. VYNPS has sufficient area onsite that has been previously disturbed (due to construction or operations activities) upon which to conduct all of these decommissioning activities. Any construction activities that would disturb

Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report

one acre or greater of soil would require a storm water permit from the Vermont Department of Environmental Conservation (VTDEC) prior to proceeding with the activity. The storm water permit would contain best management practices (BMPs) to control sediment and erosion effect on water courses and wetlands.

Based on the GEIS, the experience of plants that are being decommissioned has not included any needs for additional land offsite. Consistent with this determination, ENVY does not anticipate any changes in land use beyond the site boundary during decommissioning. Therefore, Entergy concludes that the impacts of VYNPS decommissioning on onsite/offsite land use are bounded by the GEIS.

5.1.2 Water Use

After plant shutdown, the operational demand for cooling water and makeup water will dramatically decrease. Additionally, after the plant is shut down and defueled, the amount of water used by the service water system will be much less than during normal operation of the plant. The need for cooling water will continue to decrease as the heat load of spent fuel in the spent fuel pool declines due to radioactive decay and as spent fuel is relocated from the spent fuel pool to the ISFSI. During plant shutdown, the use of potable water will decrease commensurate with the expected decrease in plant staffing levels. For these reasons, Section 4.3.2 of the GEIS concluded that water use at decommissioning nuclear reactor facilities is significantly smaller than water use during operation.

The GEIS also concluded that water use during the decontamination and dismantlement phase will be greater than that during the storage phase. However, there are no unique aspects associated with the decommissioning of VYNPS and water use for such activities as flushing piping, high pressure water washing, dust abatement, etc. Consequently, VYNPS water use impacts were addressed by the evaluation of the reference facility in the GEIS.

Therefore, ENVY concludes that the impacts of VYNPS decommissioning on water use are bounded by the GEIS.

5.1.3 Water Quality

This section considers water quality impacts of nonradioactive material for both surface and groundwater during the decommissioning process. Table E-3 of the GEIS identifies decommissioning activities that may affect water quality. These activities include system deactivation activities (draining, flushing, and liquid processing) as well as facility decontamination and dismantlement activities (water spraying and rubblization). The GEIS also emphasizes the need to minimize water infiltration during the SAFSTOR period.

ENVY has chosen to decommission VYNPS using the SAFSTOR method. During the SAFSTOR planning and actual storage periods, storm water runoff and drainage paths will be

Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report

maintained in their current configuration. Regulatory mandated programs and processes designed to minimize, detect, and contain spills will be maintained throughout the decommissioning process. Federal, state and local regulations and permits pertaining to water quality will also remain in effect and no significant changes to water supply reliability are expected. In addition to the National Pollutant Discharge Elimination System (NPDES) permit, which regulates surface water discharges from the site (Reference 9), the following permits will remain in place:

- Indirect Discharge Permit ID-9-0036-2 ID-9-0036-2 which regulates indirect discharges of treated domestic sewage and other wastes to the groundwater and indirect discharges to the Connecticut River (Reference 10).
- Solid Waste Management Facility Certification F9906-A1 which regulates land application of septage (Reference 11).
- Public Water System Permits 8332 and 20738 which regulates groundwater withdrawal for drinking and plant purposes (References 12 and 13).

Therefore, ENVY concludes that the impacts of VYNPS decommissioning on water quality are bounded by the GEIS.

5.1.4 Air Quality

Air Contaminant Source Registration Certificate WM2335 was issued by the VTDEC and regulates air emission sources at VYNPS (Reference 14). This certificate will remain in place during decommissioning. If new sources of air emissions are added or changed at the facility to support this process, the certificate will be modified as required. As new regulations are issued that impact these sources, these requirements will be addressed at the station. In addition, there are various other air quality regulations that will govern activities involving hazardous air pollutants and indoor air quality.

There are many types of decommissioning activities listed in Section 4.3.4 of the GEIS that have the potential to affect air quality. For those activities applicable to the SAFSTOR option, ENVY does not anticipate any activities beyond those listed in the GEIS that could potentially affect air quality. In addition, federal, state and local regulations pertaining to air quality will remain in effect to regulate emissions associated with fugitive dust, criteria air pollutants, hazardous air pollutants, and ozone-depleting gases. Therefore, ENVY concludes that the impacts of VYNPS decommissioning on air quality are bounded by the GEIS.

5.1.5 Aquatic Ecology

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

Aquatic ecology encompasses the plants and animals in the Connecticut River and wetlands near VYNPS. Aquatic ecology also includes the interaction of those organisms with each other and the environment. Section 4.3.5 of the GEIS evaluates both the direct and indirect impacts from decommissioning on aquatic ecology.

Direct impacts can result from activities such as the removal of shoreline structures or the active dredging of canals. VYNPS's shoreline structures are similar to the plants listed in Table E-2 of the GEIS, and there are no apparent discriminators based on the salient characteristics (size and location) listed in Table E-5 of the GEIS. Removal of the intake and discharge facilities as well as other shoreline structures will be conducted in accordance with BMPs outlined in permits issued by the VTDEC and if necessary, the U. S. Army Corps of Engineers. Intake canal dredging should no longer be required due to the diminished residual heat removal requirements, and the eventual relocation of the spent fuel to the ISFSI.

As previously discussed in Section 5.1.2, the amount of cooling water withdrawn from the Connecticut River will significantly decrease thus reducing the potential impacts from impingement and entrainment of aquatic species. Additionally, any significant potential for sediment runoff or erosion on disturbed areas will be controlled in accordance with BMPs outlined in the storm water permit. ENVY does not anticipate disturbance of lands beyond the current operational areas of the plant, so there should not be any new impacts to aquatic ecology from runoff associated with land disturbance activities.

Therefore, ENVY concludes that the impacts of VYNPS decommissioning on aquatic ecology are bounded by the GEIS.

5.1.6 Terrestrial Ecology

Terrestrial ecology considers the plants and animals in the vicinity of VYNPS as well as the interaction of those organisms with each other and the environment. Evaluations of impacts to terrestrial ecology are usually directed at important habitats and species, including plant and animals that are important to industry, recreational activities, the area ecosystems, and those protected by endangered species regulations and legislation. Section 4.3.6 of the GEIS evaluates the potential impacts from both direct and indirect disturbance of terrestrial ecology.

Direct impacts can result from activities such as clearing native vegetation or filling a wetland. ENVY does not anticipate any decommissioning activities, including ISFSI expansion, will disturb habitat beyond the operational areas of the plant. All dismantlement, demolition, and waste staging activities are envisioned to be conducted within the industrial area of the site. Also the VTDEC controls significant impacts to the environment through regulation of construction activities.

Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report

There is a nesting box on the plant main stack that was installed by VYNPS in 2009 to attract peregrine falcons at the request of the Audubon Society. There have been two consecutive years of four young born and successfully fledged since 2012. Since the peregrine falcon is protected under the Migratory Bird Treaty Act, a Migratory Bird Depredation permit from the U.S. Fish and Wildlife Service (USFWS) will be required to remove the nest prior to dismantlement of the main stack. Since this activity will be under the oversight of the USFWS, impacts are not expected to destabilize or noticeably alter this species population.

Indirect impacts may result from effects such as erosional runoff, dust or noise. Any construction activities that would disturb one acre or greater of soil would require a storm water permit from the VTDEC prior to proceeding with the activity. The storm water permit would contain BMPs to control sediment and the effects of erosion associated with the construction activity. Fugitive dust emissions will be controlled through the judicious use of water spraying. The basis for concluding that the environmental impacts of noise are bounded by the GEIS is discussed in Section 5.1.16 below.

Section 4.3.6 of the GEIS concludes that if BMPs are used to control indirect disturbances and habitat disturbance is limited to operational areas, the potential impacts to terrestrial ecology are small. As discussed above, there are no unique disturbances to the terrestrial ecology anticipated during the decommissioning of VYNPS. Therefore, ENVY concludes that the impacts of VYNPS decommissioning on terrestrial ecology are bounded by the GEIS.

5.1.7 Threatened and Endangered Species

Based on the SEIS (Reference 8), there were two federally-listed endangered aquatic species that were reported to inhabit the Connecticut River: dwarf wedge mussel and short nose sturgeon. These two same species were also state-listed as endangered. In addition, the brook floater was also state-listed as an endangered aquatic species, but the species is currently known only from the West River. It was determined in the SEIS that none of these federally-and state-listed species occurred within the vicinity (6-mile radius) of VYNPS, and that no designated critical habitat for the species existed within the vicinity of VYNPS.

The SEIS also identified three federally-listed endangered terrestrial species with the potential to occur within the vicinity of VYNPS: Jessup's milk-vetch, northeastern bulrush, and Indiana bat. The bald eagle was listed in the SEIS as a federally-listed threatened species but this species has since been delisted. These same species, including the bald eagle, are state-listed as endangered or threatened. It was determined in the SEIS that no designated critical habitat for these species exists within the vicinity of VYNPS. The SEIS also listed an additional 29 state-listed terrestrial species (21 plants and 8 animals) as threatened, endangered, or species of special concern that could potentially occur in the vicinity of the VYNPS site. Of the terrestrial species, only the state-listed bald eagle (endangered) is known to occur in the vicinity of the VYNPS site.

Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report

Section 4.3.7 of the GEIS does not make a generic determination on the impact of decommissioning on threatened and endangered species. Rather it concludes that the adverse impacts and associated significance of the impacts must be determined on a site-specific basis.

With respect to the threatened and endangered aquatic species, the environmental impacts during decommissioning are expected to be minimal. Removal of the intake and discharge facilities as well as other shoreline structures will be conducted in accordance with BMPs outlined in permits issued by the VTDEC and if necessary, the U. S. Army Corps of Engineers. Intake canal dredging is no longer expected to occur due to the diminished heat load. As previously discussed in Section 5.1.2, the amount of cooling water withdrawn from the Connecticut River will significantly decrease thus reducing the potential impacts of impingement, entrainment, and thermal discharges on aquatic species. One potential adverse impact would be the elimination of the thermal refuge for aquatic species in the discharge area which are preyed upon by the bald eagle, similar to when VYNPS is not operating in the winter months.

The environmental impacts during decommissioning are expected to be minimal on threatened and endangered terrestrial species. ENVY does not anticipate disturbing habitat beyond the operational areas of the plant for decommissioning and construction activities. Construction activities that disturb one acre or greater of soil are permitted by the VTDEC and BMPs are required to be implemented to control sediment and the effects of erosion. Additionally, VYNPS has procedural administrative controls in place which require that significant project activities undergo an environmental review prior to the activity occurring and ensure that impacts are minimized through implementation of BMPs. Federal and state regulations pertaining to listed species will also remain in effect, which will further ensure that impacts to listed species and their habitats are minimized.

Section 4.3.7 of the GEIS also suggests that care be exercised in conducting decommissioning activities after an extended SAFSTOR period because there is a greater potential for rare species to colonize the disturbed portion of the site. However as previously discussed, procedural administrative controls and federal and state regulations that will remain in effect would ensure that mitigation measures are implemented as appropriate to protect wildlife.

Based on the above, the planned decommissioning of VYNPS will not result in a direct mortality or otherwise jeopardize the local population of any threatened or endangered species.

5.1.8 Radiological

The GEIS considered radiological doses to workers and members of the public when evaluating the potential consequences of decommissioning activities.

Occupational Dose

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

The occupational radiation exposure to VYNPS plant personnel will be maintained As Low As Reasonably Achievable (ALARA) and below the occupational dose limits in 10 CFR Part 20 during decommissioning. The need for plant personnel to routinely enter radiological areas to conduct maintenance, calibration, inspection, and other activities associated with an operating plant will be reduced, thus it is expected that the occupational dose to plant personnel will significantly decrease after the plant is shut down and defueled. The station ALARA program will be maintained during dormancy and the D&D periods to ensure that occupational dose is maintained ALARA and well within 10 CFR Part 20 limits.

ENVY has elected to decommission VYNPS using the SAFSTOR alternative. It is expected that the occupational dose required to complete the decommissioning activities at VYNPS would be reduced significantly by radioactive decay during the SAFSTOR period. ENVY estimates that the occupational radiation exposure would be 1,057, 584 and 192 person-rem, after SAFSTOR dormancy periods of 10, 30 and 50 years respectively. This estimate is based on an analysis of area by area decommissioning worker occupancy, current radiation levels and projected radionuclide decay. The estimates for dormancy periods greater than 10 years are within the range of SAFSTOR dose estimates (834-326 person-rem) provided in Table 4-1 of the GEIS. As suggested in footnote (b) of Table 4-1, comparison of occupational radiation exposure to that of the DECON option may be more appropriate for short dormancy periods. As such, the estimated exposure of 1,057 person-rem for the 10 year dormancy period compares favorably with the 1,874 person-rem provided in Table 4-1 for the DECON option.

Public Dose

Section 4.3.8 of the GEIS considered doses from liquid and gaseous effluents when evaluating the potential impacts of decommissioning activities on the public. Table G-15 of the GEIS compared effluent releases between operating facilities and decommissioning facilities and concluded that decommissioning releases are lower. The GEIS also concluded that the collective dose and the dose to the maximally exposed individual from decommissioning activities are expected to be well within the regulatory standards in 10 CFR Part 20 and Part 50.

The expected radiation dose to the public from VYNPS decommissioning activities will be maintained within regulatory limits and below comparable levels when the plant was operating through the continued application of radiation protection and contamination controls combined with the reduced source term available in the facility. Also Section 7.1 of the SEIS (Reference 8) concluded that there were no site-specific radiological dose aspects associated with decommissioning of VYNPS. Therefore, ENVY concludes that the impacts of VYNPS decommissioning on public dose are small and are bounded by the GEIS.

5.1.9 Radiological Accidents

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

The likelihood of a large offsite radiological release that impacts public health and safety after VYNPS is shut down and defueled is considerably lower than the already very low likelihood of a release from the plant during power operation. This is because the majority of the potential releases associated with power operation are not relevant after the fuel has been removed from the reactor. Furthermore, handling of spent fuel assemblies will continue to be controlled under work procedures designed to minimize the likelihood and consequences of a fuel handling accident. In addition, emergency plans and procedures will remain in place to protect the health and safety of the public while the possibility of significant radiological releases exists.

Section 4.3.9 of the GEIS assessed the range of possible radiological accidents during decommissioning and separated them into two general categories; fuel related accidents and non-fuel related accidents. Fuel related accidents have the potential to be more severe and zirconium fire accidents, in particular, could produce offsite doses that exceed EPA's protective action guides (Reference 15). As part of its effort to develop generic, risk-informed requirements for decommissioning, the NRC staff performed analysis of the offsite radiological consequences of beyond-design-basis spent fuel pool accidents using fission product inventories at 30 and 90 days and 2, 5, and 10 years. The results of the study indicate that the risk at spent fuel pools is low and well within the NRC's Quantitative Health Objectives. The generic risk is low primarily due to the very low likelihood of a zirconium fire. (Reference 6)

The potential for decommissioning activities to result in radiological releases not involving spent fuel (i.e., releases related to decontamination, dismantlement, and waste handling activities) will be minimized by use of procedures designed to minimize the likelihood and consequences of such releases.

Therefore, ENVY concludes that the impacts of VYNPS decommissioning on radiological accidents are small and are bounded by the previously issued GEIS.

5.1.10 Occupational Issues

Occupational issues are related to human health and safety. Section 4.3.10 of the GEIS evaluates physical, chemical, ergonomic, and biological hazards. ENVY has reviewed these occupational hazards in the GEIS and concluded that the decommissioning approach chosen for VYNPS poses no unique hazards from what was evaluated in the GEIS. ENVY will continue to maintain appropriate administrative controls and requirements to ensure occupational hazards are minimized and that applicable federal, state and local occupational safety standards and requirements continue to be met. Therefore, ENVY concludes that the impacts of VYNPS decommissioning on occupational issues are bounded by the GEIS.

5.1.11 Cost

Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report

Decommissioning costs for VYNPS are discussed in Section 4.0 and in Attachment 1 to this report. Section 4.3.11 of the GEIS recognizes that an evaluation of decommissioning cost is not a National Environmental Policy Act requirement. Therefore, a bounding analysis is not applicable.

5.1.12 Socioeconomics

Decommissioning of VYNPS is expected to result in negative socioeconomic impacts. As VYNPS transitions from an operating plant to a shutdown plant and into the different phases of decommissioning, an overall decrease in plant staff will occur. The lost wages of these plant staff will result in decreases in revenues available to support the local economy and local tax authorities. Some laid-off workers may relocate, thus potentially impacting the local cost of housing and availability of public services.

Section 4.3.12 of the GEIS evaluated changes in workforce and population, changes in local tax revenues, and changes in public services. The evaluation also examined large plants located in rural areas that permanently shut down early and selected the SAFSTOR option. The GEIS determined that this situation is the likeliest to have negative impacts. The GEIS concluded that socioeconomic impacts are neither detectable nor destabilizing and that mitigation measures are not warranted. Therefore, ENVY concludes that the impacts of VYNPS decommissioning on socioeconomic impacts are bounded by the GEIS.

5.1.13 Environmental Justice

Executive Order 12898 dated February 16, 1994, directs Federal executive agencies to consider environmental justice under the National Environmental Policy Act. It is designed to ensure that low-income and minority populations do not experience disproportionately high and adverse human health or environmental effects because of Federal actions.

Section 4.4.6 of the SEIS (Reference 8) analyzed 2000 census data within 50 miles of VYNPS to identify minority and low income populations. The SEIS analysis concluded that there were no census block groups in Vermont or New Hampshire within the 50-mile region that exceeded the NRC thresholds defining minority populations. The only census block groups that exceeded the NRC minority population thresholds were located south and southeast of VYNPS in Massachusetts. The majority of the census block groups exceeding the thresholds defining a low-income population were also located in the same communities to the south and southeast of the site containing minority populations. Additional low-income census block groups were located in Greenfield, Adams, and Pittsfield, Massachusetts, in Bennington, Vermont, and in Keene, New Hampshire. A comparison of newer 2010 census data indicates that minority and low income demographics did not significantly change from that of the 2000 census results, indicating that the SEIS conclusions are still valid.

Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report

Section 4.13.3 of the GEIS reviewed environmental justice decommissioning impacts related to land use, environmental and human health, and socioeconomics. ENVY does not anticipate any offsite land disturbances during decommissioning, thus the land use impacts are not applicable for VYNPS. In addition as previously discussed in Section 5.1.12, it was determined that socioeconomic impacts from decommissioning are bounded by the GEIS. Potential impacts to minority and low-income populations would mostly consist of radiological effects. Based on the radiological environmental monitoring program data from VYNPS, the SEIS determined that the radiation and radioactivity in the environmental media monitored around the plant have been well within applicable regulatory limits. As a result, the SEIS found that no disproportionately high and adverse human health impacts would be expected in special pathway receptor populations (i.e., minority and/or low income populations) in the region as a result of subsistence consumption of water, local food, fish, and wildlife.

Therefore, ENVY concludes that the impacts of VYNPS decommissioning on environmental justice are small and are bounded by the GEIS.

5.1.14 Cultural, Historic, and Archeological Resources

Based on a review of the Vermont State Historic Preservation Office (SHPO) files and information provided by the applicant, the NRC concluded in Section 4.4.5 of the SEIS (Reference 8) that the potential impacts from license renewal of VYNPS on historic and archaeological resources would be small. The NRC's conclusion was based on: 1) no prehistoric archaeological sites have been identified on the VYNPS property, and 2) environmental review procedures have been put in place at VYNPS regarding undertakings that involve land disturbing activities in undisturbed surface and subsurface areas as well as modifications to historic structures (i.e., Governor Hunt House). These environmental protection procedures include contacting the SHPO to establish the actions necessary to protect known or as of yet undiscovered cultural resources before an action are allowed to occur.

The cultural, historic, and archeological impact evaluation conducted in the GEIS (Reference 6) focused on similar attributes as the SEIS (Reference 8). The GEIS evaluated direct effects such as land clearing and indirect effects such as erosion and siltation. The conclusion for the license renewal evaluation is also applicable to the decommissioning period because: 1) decommissioning activities will be primarily contained to disturbed areas located away from areas of existing or high potential for archaeological sites 2) construction activities that disturb one acre or greater of soil are permitted by VTDEC approval and BMPs are required to control sediment and the effects of erosion, and 3) environmental protection procedures pertaining to archaeological and cultural resources will remain in effect during decommissioning.

Therefore, ENVY concludes that the impacts of VYNPS decommissioning on cultural, historic, and archeological resources are small and are bounded by the GEIS.

5.1.15 Aesthetic Issues

During decommissioning, the impact of activities on aesthetic resources will be temporary and remain consistent with the aesthetics of an industrial plant. In most cases, Section 4.3.15 of the GEIS concludes that impacts such as dust, construction disarray, and noise would not easily be detectable offsite.

The GEIS concluded that the retention of structures during a SAFSTOR period or the retention of structures onsite at the time the license is terminated is likewise not an increased visual impact, but instead a continuation of the visual impact analyzed in the facility construction or operations final environmental statement.

After the decommissioning process is complete, site restoration activities will result in structures being removed from the site and the site being backfilled, graded and landscaped as needed. The GEIS concludes that the removal of structures is generally considered beneficial to the aesthetic impacts of the site.

Therefore, ENVY concludes that the impacts of VYNPS decommissioning on aesthetic issues are bounded by the GEIS.

5.1.16 Noise

General noise levels during the decommissioning process are not expected to be any more severe than during refueling outages and are not expected to present an audible intrusion on the surrounding community. Some decommissioning activities may result in higher than normal onsite noise levels (i.e., some types of demolition activities). However, these noise levels would be temporary and are not expected to experience an audible intrusion on the surrounding community.

Section 4.3.16 of the GEIS indicates that noise impacts are not detectable or destabilizing and makes a generic conclusion that potential noise impacts are small. Based on the standard decommissioning approach proposed for VYNPS, ENVY concludes that the impacts of VYNPS decommissioning on noise are bounded by the GEIS.

5.1.17 Transportation

The transportation impacts of decommissioning are dependent on the number of shipments to and from the plant, the types of shipments, the distance the material is shipped, and the radiological waste quantities and disposal plans. The shipments to and from the plant would primarily result from construction activities associated with the ISFSI expansion and shipments of radioactive wastes and non-radioactive wastes associated with dismantlement and disposal of structures, systems and components.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

The estimated cubic feet of radioactive waste associated with VYNPS decommissioning that will either be destined for land disposal (Class A, B and C) or a geologic repository (Greater than Class C) is summarized as follows:

- Class A: 664,892 cubic feet
- Class B: 1,002 cubic feet
- Class C: 505 cubic feet
- Greater than Class C (GTCC): 357 cubic feet

Table 4-7 of the GEIS estimated that the volume of land needed for LLRW disposal from the referenced BWR was 636,000 cubic feet under the SAFSTOR alternative. ENVY presently estimates the LLRW volume (Class A, B, and C) for VYNPS that is destined for land disposal is approximately 666,399 cubic feet using the SAFSTOR alternative. This volume of LLRW is comparable to the range analyzed in the GEIS.

ENVY must comply with applicable regulations when shipping radioactive waste from decommissioning. The NRC has concluded in Section 4.3.17 of the GEIS that these regulations are adequate to protect the public against unreasonable risk from the transportation of radioactive materials.

The number of GTCC waste shipments expected to occur during decommissioning is expected to be below the number referenced in Table 4-6 of the GEIS. These shipments will occur over an extended period of time and will not result in significant changes to local traffic density or patterns, the need for construction of new methods of transportation, or significant dose to workers or the public.

In addition, shipments of non-radioactive wastes from the site are not expected to result in measurable deterioration of affected roads or a destabilizing increase in traffic density.

Therefore, ENVY concludes that the impacts of VYNPS decommissioning on transportation are bounded by the GEIS.

5.1.18 Irreversible and Irrecoverable Commitment of Resources

Irreversible commitments are commitments of resources that cannot be recovered, and irretrievable commitments of resources are those that are lost for only a period of time.

Uranium is a natural resource that is irretrievably consumed during power operation. After the plant is shutdown, uranium is no longer consumed. The use of the environment (air, water, land) is not considered to represent a significant irreversible or irretrievable resource commitment, but rather a relatively short-term investment. Since the VYNPS site will be decommissioned to meet the unrestricted release criteria found in 10 CFR 20.1402, the land is not considered an

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

irreversible resource. The only irretrievable resources that would occur during decommissioning would be materials used to decontaminate the facility (e.g., rags, solvents, gases, and tools), and the fuel used for decommissioning activities and transportation of materials to and from the site. However, the use of these resources is minor.

While the GEIS does not specify quantitative bounds for commitment of irreversible and irretrievable resources, ENVY concludes that the impacts of VYNPS decommissioning on these resources are negligible and consistent with the conclusions of the GEIS.

5.2 Environmental Impacts of License Termination - NUREG-1496

According to the schedule provided in Section 3 of this report, a license termination plan for VYNPS will not be developed until approximately two years prior to the final site decontamination (currently assumed to be approximately the year 2072 subject to ENVY's commitment regarding the commencement of radiological decommissioning in the Settlement Agreement (Attachment 2)). At that time, a supplemental environmental report will be submitted as required by 10 CFR 50.82(a)(9). While detailed planning for license termination activities will not be performed until after the SAFSTOR dormancy period, the absence of any unique site-specific factors, significant groundwater contamination, unusual demographics, or impediments to achieving unrestricted release support an expectation that impacts resulting from license termination will be similar to those evaluated in NUREG-1496.

5.3 Discussion of Decommissioning in the Draft Supplemental Environmental Impact Statement (DSEIS)

As part of the VYNPS license renewal process, postulated impacts associated with decommissioning were discussed in Section 7.0 of the DSEIS (Reference 8). Identified were six issues related to decommissioning as follows:

- Radiation Doses
- Waste Management
- Air Quality
- Water Quality
- Ecological Resources
- Socioeconomic Impacts

The NRC staff did not identify any new and significant information during their independent review of the VYNPS license renewal environmental report (Reference 16), the site audit, or the

Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report

scoping process for license renewal. The NRC concluded that there are no impacts related to these issues beyond those discussed in the GEIS for license renewal (Reference 17) or the GEIS for decommissioning (Reference 6). For the issues identified above, the license renewal and decommissioning GEISs both concluded the impacts are small. The NRC found no site-specific issues related to decommissioning. There are no contemplated decommissioning activities that would alter that conclusion.

5.4 Additional Considerations

The following considerations are relevant to concluding that decommissioning activities will not result in significant environmental impacts not previously reviewed:

- The release of effluents will continue to be controlled by plant license requirements and plant procedures.
- ENVY will continue to comply with the Offsite Dose Calculation Manual, Radiological Environmental Monitoring Program, and the Groundwater Protection Initiative Program during decommissioning.
- Releases of non-radiological effluents will continue to be controlled per the requirements of the NPDES permit and applicable State of Vermont permits.
- Systems used to treat or control effluents during power operation will either be maintained or replaced by temporary or mobile systems for the decommissioning activities.
- Radiation protection principles used during plant operations will remain in effect during decommissioning.
- Sufficient decontamination and source term reduction prior to dismantlement will be performed to ensure that occupational dose and public exposure will be maintained below applicable limits.
- Transport of radioactive waste will be in accordance with plant procedures, applicable Federal regulations, and the requirements of the receiving facility.
- Site access control during decommissioning will minimize or eliminate radiation release pathways to the public.
- The Settlement Agreement (Attachment 2) requires ENVY to conduct all activities in Vermont, including at the VY Station site, in accordance with federal and state laws, including VDH's Radiological Health Rule.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

Additionally, draft NUREG-2157, Waste Confidence Generic Environmental Impact Statement, found that the generic environmental impacts of ongoing spent fuel storage are small (Reference 18).

5.5 Conclusions

Based on the above discussions, ENVY concludes that the environmental impacts associated with planned VYNPS site-specific decommissioning activities are less than and bounded by the impacts addressed by previously issued environmental impact statements. Specifically, the environmental impacts are bounded by the GEIS (Reference 6) and SEIS (Reference 8).

1. The postulated impacts associated with the decommissioning method chosen, SAFSTOR, have already been considered in the SEIS and GEIS.
2. There are no unique aspects of VYNPS or of the decommissioning techniques to be utilized that would invalidate the conclusions reached in the SEIS and GEIS.
3. The methods assumed to be employed to dismantle and decontaminate VYNPS are standard construction-based techniques fully considered in the SEIS and GEIS.

Therefore, it can be concluded that the environmental impacts associated with the site-specific decommissioning activities for VYNPS will be bounded by appropriate previously issued environmental impact statements.

10 CFR 50.82(a)(6)(ii) states that licensees shall not perform any decommissioning activities, as defined in 10 CFR 50.2 that result in significant environmental impacts not previously reviewed. No such impacts have been currently identified. ENVY will conduct ongoing reviews during the decommissioning process to assure identification of any such impacts.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

6.0 REFERENCES

1. Regulatory Guide 1.185, "Standard Format and Content for Post-Shutdown Decommissioning Activities Report," Revision 1, dated June 2013.
2. Letter, Entergy Nuclear Operations, Inc., to USNRC, "Notification of Permanent Cessation of Power Operations," BNY 13-079, dated September 23, 2013. (ADAMS Accession No. ML13273A204)
3. NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors," Final Report dated November 2002.
4. AIF/NESP-036, "A Guideline for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," dated May 1986.
5. Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," Revision 2, dated October 2011.
6. NUREG-0586, Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors. November 2002.
7. NUREG-1496, Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities. July 1997.
8. NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 30, Regarding Vermont Yankee Nuclear Power Station. August 2007.
9. Entergy Nuclear Vermont Yankee, LLC NPDES Permit No. VT0000264. March 2006.
10. Entergy Nuclear Vermont Yankee, LLC Indirect Discharge Permit ID-9-0036. January 2011.
11. Entergy Nuclear Vermont Yankee, LLC Solid Waste Management Facility Certification F0405. December 2004.
12. Entergy Nuclear Vermont Yankee Public Water System Temporary Permit to Operate No. 8332. July 2008.
13. Entergy Nuclear Vermont Yankee Public Water System Temporary Permit to Operate No. 20738. August 2008.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

14. Vermont Yankee Air Contaminant Source Registration Certificate WM2335. 2013.
15. PAG Manual, Protective Action Guides and Planning Guidance for Radiological Incidents, Draft for Interim Use and Public Comment. March 2013.
16. Vermont Yankee Nuclear Power Station, License Renewal Application. Appendix E, Applicant's Environmental Report. January 2006.
17. NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants. June 2013.
18. NUREG-2157, Waste Confidence Generic Environmental Impact Statement, Draft Report for Comment. September 2013.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

Attachment 1: VYNPS Site-Specific Decommissioning Cost Estimate

Draft Decommissioning Cost Estimate Contained in Appendix D of Site Assessment Study

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

Attachment 2: Settlement Agreement between ENO, ENVY and State of Vermont

SETTLEMENT AGREEMENT

This Settlement Agreement (“Agreement”) is entered into by and between Entergy Nuclear Vermont Yankee, LLC (“ENVY”), Entergy Nuclear Operations, Inc. (“ENO,” and together with ENVY, “Entergy VY”), the Vermont Public Service Department (“PSD”), the Vermont Agency of Natural Resources (“ANR”), and the Vermont Department of Health (“VDH”) (collectively, “the Parties”).

A. The Vermont Yankee Nuclear Power Station (“VY Station”) is a nuclear power plant located in Vernon, Vermont, that is owned by ENVY and operated by ENO.

B. Entergy VY operated the VY Station until March 21, 2012, pursuant to a license from the Nuclear Regulatory Commission (“NRC”) and a Certificate of Public Good (“CPG”) from the Vermont Public Service Board (“Board”). Before the expiration of those approvals, the NRC renewed the license of Entergy VY for a further 20-year term, and ENVY and ENO petitioned the Board for a new CPG for a further 20-year term. The Parties disagree whether ENVY had authority from the State of Vermont to operate the VY Station after March 21, 2012. The Parties also disagree about much of the evidence presented to the Board in connection with Entergy VY’s petition for a further 20-year term, including, among other things, the degree, extent, and duration of economic dislocation that residents of Vermont would experience as a result of the shutdown of the VY Station.

C. Until August 27, 2013, Entergy VY was seeking from the Board a CPG that would permit Entergy VY to operate the VY Station through 2032. On August 27, 2013, Entergy VY announced that it will cease operating the VY Station at the end of the current operating cycle. On August 27, 2013, Entergy VY filed a Second Amended Petition with the Board, seeking a CPG from the Board to continue operations to generate electricity only through December 31, 2014. On September 23, 2013, ENO formally notified the NRC that the VY Station would permanently cease power operations effective at the end of the current operating cycle, which is expected to be no later than December 31, 2014.

D. Entergy VY and the State of Vermont (“State”) are engaged in and/or contemplating other actual and potential litigation relating to the VY Station, including: (1) potential petitions for review by the United States Supreme Court of the August 14, 2013, decision of the United States Court of Appeals for the Second Circuit in *Entergy v. Shumlin* (2d Cir. Docket Nos. 12-707 and 12-791); (2) Entergy VY’s motion for attorneys’ fees in *Entergy v. Shumlin* (D. Vt. Docket No. 1:11-cv-99); (3) Public Service Board Docket No. 7600; (4) potential petitions for review of the December 10, 2013, decision of the United States Court of Appeals for the Second Circuit in Entergy VY’s challenge to Vermont’s generation tax enacted in 2012 (2d Cir. Docket No. 12-4659); and (5) Entergy VY’s appeal to the Supreme Court of Vermont from the Board’s decisions in Public Service Board Docket No. 7440 (Sup. Ct. Vt. Docket No. 2013-043). In accordance with this Agreement, Entergy VY and the State of Vermont (through its appropriate agencies and departments) are entering into other agreements and/or filing pleadings that will resolve the claims between the Parties in items (1) - (5) above, with each Party to bear its own costs, including attorneys’ fees, with the exception of any fees or costs that are covered by statutory bill-back or other state billing authority.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

E. It is in the best interests of Entergy VY and the State that post-operation matters concerning the VY Station be addressed as constructively and transparently as possible, and be guided by the following principles: (1) the VY Station should be permitted to operate through the end of the current operating cycle to allow a reasonable transition and adjustment period for plant employees and other affected stakeholders; (2) to facilitate the decommissioning and overall closure of the VY Station, spent nuclear fuel (“SNF”) should be moved from the spent fuel pool to dry cask storage in a timely manner; (3) to facilitate the prompt economic redevelopment of the VY Station site, the decommissioning process should occur without unreasonable delay, as soon as there are sufficient funds in the Nuclear Decommissioning Trust (“NDT”) for the VY Station; (4) it is in the best interests of the State for the VY Station site to be available for prompt economic redevelopment through the expeditious progress and completion of decommissioning and, as provided for in prior agreements, site restoration; and (5) a specific fund should be established related to Entergy VY’s site restoration obligations in connection with the VY Station as agreed to herein.

In consideration of all of the foregoing, the obligations hereafter set forth and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows.

1. On or before December 31, 2014, Entergy VY shall cease all nuclear power generating operations at the VY Station, except for the operation of emergency back-up generators as needed, including periodic testing of same. Notwithstanding the foregoing, in the event the current operating cycle is affected by unexpected operational events that are beyond Entergy VY’s reasonable control (whether external to the plant or otherwise), Entergy VY may seek permission to operate the VY Station for a limited period of time after December 31, 2014. Entergy VY will not operate the VY Station beyond December 31, 2014, unless: (1) PSD supports Entergy VY’s request to extend operation, and (2) Entergy VY seeks and obtains approval from both the NRC and the Board by December 31, 2014, for such limited continued operation. It shall not be sufficient that Entergy VY commenced the steps needed to obtain NRC and Board approval before December 31, 2014; Entergy shall not operate in 2015 unless, during 2014, it receives every approval necessary for those limited operations. Entergy VY assumes the risk that either the NRC or the Board or both may not approve Entergy VY’s request in 2014. In the event that Entergy VY obtains the Board and NRC approvals to operate beyond December 31, 2014, under no circumstance, including pursuant to 3 V.S.A. § 814(b), shall Entergy VY refuel or in any way supplement or extend the normal life of the fuel at the VY Station for the current operating cycle, or conduct nuclear power generating operations at the VY Station after February 28, 2015.
2. Entergy VY and PSD shall jointly recommend to and shall support before the Board the issuance of CPG(s) effective as of March 21, 2012, for: (1) operation of the VY Station through December 31, 2014, and (2) storage of SNF derived from such operation, as requested by the second amended petition filed by Entergy VY in Board Docket No. 7862 on August 27, 2013. Entergy VY and PSD will submit a Memorandum of Understanding (“MOU”) to the Board, in the form attached as Exhibit A, in connection with those filings.

In the event that by March 31, 2014, the Board has not granted Entergy VY a CPG that: (i) approves operation of the VY Station until December 31, 2014, and the storage of SNF derived from such operation; and (ii) approves the Parties’ jointly filed MOU substantially in its entirety and contains conditions that do not materially alter, add to, or reject what is

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

provided for by the MOU, each Party agrees that this Agreement may terminate, if such Party so determines in its sole discretion and provides written notice within ten (10) days of Board issuance of its order, whereupon each Party shall be placed in the position that it occupied before entering into this Agreement, except that the obligations of paragraph 3(a) through (c) and the actions taken thereunder are final and shall not be affected by any termination.

3. Contemporaneous with this Agreement and subject to the provision for costs and fees in paragraph 24 of this Agreement, Entergy VY and the State or the PSD shall take the following steps or refrain from taking the steps noted (as appropriate) with respect to the litigation described below, which they are engaged in and/or contemplating:
 - a. Entergy VY and the State shall not file petitions for writs of *certiorari* for review by the United States Supreme Court of the August 14, 2013, decision of the United States Court of Appeals for the Second Circuit in *Entergy v. Shumlin* (2d Cir. Docket Nos. 12-707 and 12-791);
 - b. Entergy VY shall move to dismiss, with prejudice, its claim for attorneys' fees in *Entergy v. Shumlin* (D. Vt. Docket No. 1:11-cv-99);
 - c. Entergy VY shall not file petitions for rehearing or writ of *certiorari* for review by the United States Supreme Court of the December 10, 2013, decision of the United States Court of Appeals for the Second Circuit (2d Cir. Docket No. 12-4659) in connection with the generation tax, and shall not challenge the generating tax at issue in that case in any other proceeding or tribunal; and
 - d. Within thirty (30) days of this Agreement or receipt, as appropriate, Entergy VY shall pay all outstanding and all properly submitted future bill-back invoices issued by the State.

Upon the Board's issuance of a CPG as described in paragraph 2:

- e. Entergy VY shall withdraw its appeal to the Supreme Court of Vermont from the Board's decisions in Public Service Board Docket No. 7440 (Sup. Ct. Vt. Docket No. 2013-043); and
 - f. Entergy VY and PSD shall jointly recommend that the Board close Docket 7600.
4. Entergy VY shall conduct all activities in Vermont, including at the VY Station site, in accordance with federal and state laws, including VDH's Radiological Health Rule.
5. Entergy VY shall operate the VY Station in accordance with its existing National Pollutant Discharge Elimination System ("NPDES") permit. Entergy VY and ANR agree to continue to pursue issues related to Entergy VY's thermal discharge through ANR's NPDES permitting process, in accordance with state and federal law.
6. By December 31, 2014, Entergy VY shall complete and shall provide to PSD, ANR, and VDH a site assessment study of the costs and tasks of radiological decommissioning, SNF management, and site restoration of the VY Station. One scenario evaluated in that site assessment study shall be proceeding to prompt decontamination and dismantling (DECON),

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

rather than putting the VY Station into a storage and monitoring phase prior to decontamination and dismantling (SAFSTOR), as those terms are defined by the NRC. The site assessment study shall include, without limitation, an analysis of steps required to move all SNF to dry fuel storage and to close the spent fuel pool. The site assessment study also shall include, without limitation, a full assessment of non-radiological conditions at the VY Station site. In connection with the site assessment study, Entergy VY shall conduct a good faith search for, and provide to, ANR and VDH copies of all commercial general liability insurance policies in its possession, along with all pollution legal liability policies and all other insurance policies in its possession that may provide coverage for investigation and cleanup of releases of pollutants at or from the VY Station site from the date construction of the VY Station began, to the present. Once the site assessment study is completed, and before any submission to the NRC of the site assessment study, any site-specific estimate, or any Post-Shutdown Decommissioning Activities Report ("PSDAR"), Entergy VY shall review the results of the study with PSD, ANR, and VDH, and shall consider any comments provided by those parties for inclusion in the PSDAR that Entergy VY, as the NRC licensee, is responsible for submitting to the NRC, without limitation of the State's rights to otherwise comment or participate in the NRC process. Entergy VY shall file its PSDAR for the VY Station with the NRC no sooner than sixty (60) days after completing the site assessment study described in this paragraph. Any PSDAR Entergy VY submits for the VY Station will include this Agreement and reflect Entergy VY's commitments to the State in that report.

7. Entergy VY shall make appropriate filings with the NRC to obtain authority to begin radiological decommissioning within one hundred twenty (120) days after it has made a reasonable determination that the funds in the NDT are adequate to complete decommissioning and remaining SNF management activities that the federal government has not yet agreed (or been ordered) to reimburse. Once Entergy VY receives either NRC approval of, or non-opposition to, its filings, Entergy VY shall promptly commence, pursue, and complete as soon as reasonably possible radiological decontamination and dismantling activities. Entergy VY shall provide to the PSD such additional explanatory or supporting information as the PSD reasonably may request relating to its evaluation of the adequacy of the NDT.
8. As used in this Agreement, the period of "site restoration" applies only to the period of time after radiological decommissioning has been completed to the satisfaction of the NRC. EVY expressly acknowledges the State's jurisdiction over site restoration. Following completion of the site assessment study specified in paragraph 6, EVY, PSD, ANR, and VDH shall work in good faith to determine in a timely and cost-effective manner overall site restoration standards necessary to support use of the property without limitation (excepting any independent spent fuel storage installation ("ISFSI") and any perimeter related to it), including that EVY shall not employ rubbleization at the VY Station site (*i.e.*, demolition of an above-grade decontaminated concrete structure into rubble that is buried on site) and addressing removal of structures and radiological exposure levels. Nothing in this Agreement is intended to limit the authority of state agencies to require standards for site restoration commensurate with the standards most protective to the environment as employed at similar sites nationwide or required by law.
9. EVY shall commence site restoration in accordance with the overall site restoration standards established pursuant to paragraph 8 promptly after completing radiological decommissioning. The standards and timing for site restoration may be adjusted by agreement of EVY, PSD, ANR, and/or VDH if the property or any sub-unit of the property is to be used solely for

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

industrial, commercial, or other similar uses that do not require immediate or full completion of "site restoration" to accommodate such use of the property.

10. Upon the Board's issuance of a CPG as described in paragraph 2, EVY shall establish a separate trust fund specifically and solely dedicated to funding site restoration at the VY Station ("Site Restoration Fund"), as described in paragraphs 8 and 9. EVY shall designate the State of Vermont as a material beneficiary to the Site Restoration Fund until site restoration is completed in accordance with the overall site restoration standards established pursuant to paragraph 8, and shall provide to the State within sixty (60) days of the Board's issuance of a CPG draft trust terms and provisions. Within thirty (30) days of receipt of the draft trust terms and provisions, the State shall provide comments to EVY regarding the same, which EVY shall accept and incorporate so long as commercially reasonable. Provided that the Board issues the CPG as described in paragraph 2, EVY will make initial deposits, in the form of cash or other equivalent financial instrument (including a secured note) in a form acceptable to the PSD (which approval shall not be unreasonably withheld) and the Board, into the Site Restoration Fund as follows:
 - a) \$10 million within thirty (30) days of the Board's issuance of a CPG as described in paragraph 2;
 - b) \$5 million by December 31, 2015;
 - c) \$5 million by December 31, 2016;
 - d) \$5 million by December 31, 2017.

Those initial deposits into the Site Restoration Fund shall not be drawn from the NDT or affect any financial assurance or guarantee in existence with respect to the VY Station as of the date of this Agreement. EVY shall also provide financial assurance, in the form of a parent guarantee from Entergy Corporation in the amount of \$20 million for the Site Restoration Fund, provided, however, that such \$20 million guarantee shall be established only after the existing parent guarantee from Entergy Corporation, dated January 26, 2010, and related to paragraph 13 of the Memorandum of Understanding in Docket No. 6545 is terminated. The \$20 million parent guarantee can be eliminated if the balance in the Site Restoration Fund exceeds \$60 million (either as a result of additional deposits or fund performance).

11. Except as otherwise provided in this Agreement, the Parties reserve all rights regarding further proceedings related to the VY Station, including without limitation its decommissioning and the proper use of the NDT and to seek or contest expenditures from that fund with the NRC and in any other appropriate forum. No Party's exercise of such rights shall affect the terms of this Agreement or release or reduce the obligations of the Parties hereunder. Notwithstanding the foregoing:
 - (a) In the event that funds from the NDT are expended for SNF management activities, Entergy VY shall diligently pursue all available reimbursement of such expenses, including from the federal government, and Entergy VY shall deposit all such proceeds into either: (i) the NDT, or (ii) a separate trust (if allowed under existing federal and state law, and other agreements), provided that the funds in any such trust are: (1) dedicated to meeting the liabilities of EVY, including

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

decommissioning, SNF management, and site restoration activities at the VY Station; (2) considered original transferred trust funds (not as new contributions from Entergy VY) subject to calculation and distribution of any Excess Funds under paragraph 3 of the Memorandum of Understanding in Docket No. 6545, as amended by the Board's Orders in that docket; and (3) considered part of the NDT for purposes of determining whether "the funds in the NDT are adequate" as required by paragraph 7 of this Agreement, and included in EVY's submission to the NRC and considered part of sufficient funds under 10 C.F.R. Part 50 for purposes of commencing decommissioning. Any such separate trust shall be in a form that is commercially consistent with trusts of that type, provided that Entergy VY shall provide the trust document(s) to the PSD at least sixty (60) days before the trust is formed and shall provide notice to the PSD at least sixty (60) days before any material change is made to the trust document(s) so that the State will have the opportunity to pursue any legal remedies available to it to redress any concerns it may have with the trust formation or amendment document(s) if such concerns cannot be resolved through mutual agreement of the parties.

- (b) Entergy VY shall not seek reimbursement from the NDT or Department of Energy ("DOE") of any amount relating to: (i) the five (5) annual economic development payments of \$2 million each (for a total of \$10 million) identified in paragraph 17 below; or (ii) the released escrow funds (approximately \$5.2 million) identified in paragraph 14 below.
 - (c) Entergy VY shall not seek reimbursement from the NDT or DOE for deposits to the Site Restoration Fund. Consistent with prior agreements and orders regarding proper use of the NDT and distributions of any excess funds in the NDT, including paragraph 3 of the Memorandum of Understanding in Docket No. 6545 as amended by the Board's orders in that docket, after site restoration activities have been completed in accordance with the overall site restoration standards established pursuant to paragraph 8, any remaining funds in the Site Restoration Fund shall be released to EVY or its designee.
12. Entergy VY shall apply to the NRC for every approval needed to release portions of the VY Station site for other use after Entergy VY determines in good faith that such portions reasonably could be made available for such use, and shall diligently pursue such applications to completion, provided, however, that Entergy VY shall not be required to submit such applications for parcels smaller than ten acres nor more frequently than once every five years. Entergy VY shall not wait until completion of radiological decommissioning to apply to the NRC to make appropriate portions of the site available for reuse.
13. EVY or its affiliate owns the property on which the VY Station is located ("VY Property"). EVY for itself or on behalf of its affiliate shall grant the State (through its designated agency or department) a right of first refusal to purchase the VY Property, and if the owner of the VY Property offers less than all of the VY Property for sale at any one time, the right of first refusal shall apply to each portion from time to time, as they are so offered. The price payable by the State shall be fair market value as determined by an independent appraisal performed by a mutually agreed upon MAI appraiser at the time the right of first refusal is exercised. If the parties are unable to agree on an appraiser within 60 days, each party shall select an

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

independent appraiser, who in turn will select a third independent appraiser to conduct the valuation. The State's right of first refusal as to each offered portion of the VY Property must be exercised by July 1 of the year following EVY's notice to the State that the VY Property or a portion thereof is available for sale. The State and the owner of the VY Property shall enter into any separate documents or instruments necessary to effectuate this right of first refusal and the intent of this provision.

14. EVY has made quarterly payments related to the Clean Energy Development Fund ("CEDF") into an escrow account since March 21, 2012. In consideration of all provisions of this Agreement, EVY shall make no future payments into that escrow account and make no further payments into the CEDF, with the exception that all amounts held in the escrow account (approximately \$5.2 million at the time of execution of this Agreement) shall be paid to the CEDF within thirty (30) days of the Board's issuance of a CPG as described in paragraph 2, with at least fifty percent (50%) of those amounts to be used in accordance with CEDF criteria for clean energy development activities in or for the benefit of Windham County, Vermont. EVY shall not seek or accept funds from the NDT relating to those escrowed funds.
15. During the period of continued operation of the VY Station for nuclear power generating activities pursuant to paragraph 1 above, EVY shall timely pay all taxes and other monies owed to the State, the Town of Vernon, and any other political subdivision of the State, including the generation tax. Entergy VY specifically reserves its rights to challenge the imposition of, or the amount of, any tax, fee, or other payment not already in effect as of the date of this Agreement which is sought to be imposed on it by the State or any political subdivision thereof, including the right to seek an injunction or other relief in connection with such challenge.
16. In consideration of all provisions of this Agreement, including dismissal of litigation described above, for calendar year 2015 EVY shall make a one-time payment of \$5 million on or before April 25, 2015, to the State of Vermont Department of Taxes. Such payment shall not satisfy any obligation(s) EVY may have now or in the future for: amounts owed to any city or town, including, without limitation, the Town of Vernon or the Town of Brattleboro; EVY's obligation to make in January 2015 the fourth quarterly payment of the generation tax owed for calendar year 2014 operations and, in the event that it generates electricity subsequent to 2014, EVY's obligation to pay the generation tax with respect to such subsequent quarters; or EVY's obligations to pay state income, withholding, and sales and use taxes. If a Vermont law is enacted subsequent to execution of this Agreement that imposes on EVY a state property tax or obligation to make payments in lieu of state property tax related to the VY Station effective in calendar year 2015, the \$5 million payment required under this paragraph for calendar year 2015 shall be an offset against any such amount owed in calendar year 2015.
17. For each of the next five years -- 2014, 2015, 2016, 2017, and 2018 -- EVY shall make a payment to the State of Vermont on or before April 1 of each year in the amount of \$2 million to promote economic development in Windham County, Vermont. EVY shall not seek or accept reimbursement from the NDT for any of these payments. Payments pursuant to this paragraph shall be sent to the attention of the Secretary of Commerce and Community Development, Agency of Commerce and Community Development Central Office, 1 National Life Drive #6, Montpelier, Vermont 05620.
18. The introductory paragraphs contained in this Agreement express the intentions of the Parties

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

with respect to the VY Station. The binding obligations of the Parties pursuant to this Agreement are set forth in paragraphs 1 through 33. Except as expressly stated in this Agreement, the Parties retain all authority and reserve all rights to take any actions authorized by law. Other than the obligations specifically and expressly undertaken in this Agreement, the Parties reserve and retain all rights, including without limitation Entergy VY's reservation of the right to challenge any requirement or obligation imposed by state law on the ground that such law is preempted by applicable federal law or is otherwise invalid, and the State's reservation of its rights to participate in NRC proceedings and to dispute Entergy VY's use(s) of the NDT.

19. Nothing in this Agreement shall be interpreted as prohibiting or restricting Entergy VY from complying with any requirements or orders of the NRC, or any obligation under its NRC license. To the extent that Entergy VY would be required to obtain approval from the NRC in order to fulfill any obligation under this Agreement, Entergy VY shall pursue such NRC approvals diligently and in good faith, and shall advance each related request by a date reasonably expected to be necessary to meet its obligations under this Agreement.
20. Nothing in this Agreement shall affect, restrict, or limit the jurisdiction or regulatory authority of any state or federal agencies over Entergy VY or the VY Station site.
21. The Parties have made compromises on specific issues to reach this Agreement. This Agreement, and all orders approving and implementing provisions of this Agreement shall not be construed by any Party or tribunal as having precedential impact on any future proceedings involving the Parties, except in a proceeding to enforce the terms of this Agreement.
22. Except as expressly stated in this Agreement, all other agreements, Board orders and MOUs (collectively "Requirements") remain in full force and effect. Entergy VY shall operate and conduct all other activities at the VY Station, including the operation of emergency generators, in full compliance with all such Requirements, as required by state and federal law.
23. The Parties shall negotiate in good faith the terms of necessary instruments to be filed with the appropriate tribunals to embody the terms necessary to accomplish the goals of this Agreement.
24. Each Party bears its own costs and fees in connection with the litigation and other proceedings resolved by this Agreement, including any future litigation related to this Agreement or to the continued operation, shutdown, decommissioning, or site restoration of the VY Station, with the exception of any fees or costs covered by statutory bill-back authority incurred by any state agency.
25. Any notice given pursuant to this Agreement shall be in writing and delivered by: hand (with mailed confirmation copy); receipted overnight delivery service; email (if acknowledged by a reply email from the recipient identified in this Agreement); or mail, first class postage prepaid, with receipted delivery, to the other Party at the address set forth below:

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

If to PSD:

Commissioner
Vermont Public Service Department
112 State Street -- Drawer 20
Montpelier, VT 05620

With a copy to:

Director for Public Advocacy
Vermont Public Service Department
112 State St.
Montpelier, VT 05620-2601

and a copy to:

Vermont Office of the Attorney General
109 State Street
Montpelier, VT 05609-1001

If to ANR:

Secretary
Vermont Agency of Natural Resources
1 National Life Drive, Davis 2
Montpelier, Vermont 05620-3901

With a copy to:

General Counsel
Vermont Agency of Natural Resources
1 National Life Drive, Davis 2
Montpelier, Vermont 05620-3901

and a copy to:

Vermont Office of the Attorney General
109 State Street
Montpelier, VT 05609-1001

If to VDH:

Commissioner
Vermont Department of Health
108 Cherry Street
Burlington, VT 05402

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

With a copy to:

Senior Policy and Legal Advisor
Vermont Department of Health
108 Cherry Street
Burlington, VT 05402

and a copy to:

Vermont Office of the Attorney General
109 State Street
Montpelier, VT 05609-1001

If to Office of the Attorney General:

Vermont Office of the Attorney General
109 State Street
Montpelier, VT 05609-1001

If to Entergy VY:

Entergy Nuclear Vermont Yankee, LLC
Site Vice President
P.O. Box 250
320 Governor Hunt Rd
Vernon, VT 05354

With a copy to:

Entergy Nuclear Vermont Yankee, LLC
General Counsel
639 Loyola Avenue
New Orleans, LA 70113

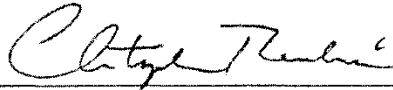
26. This Agreement shall be governed by and construed in accordance with the laws of the State of Vermont and the courts of the State of Vermont shall be an available venue for enforcement of any disputes arising under this Agreement. The Parties reserve all rights regarding other possible venues. The Parties' obligations under this Agreement are to be applied and enforced consistent with the plain meaning of the language used herein.
27. Entergy VY, PSD, ANR, and VDH each enter into this Agreement freely and after opportunity for and actual consultation with all desired counsel, legal and otherwise, of its choice.
28. Entergy VY, PSD, ANR, and VDH shall reasonably and in good faith cooperate in connection with this Agreement, including by providing executed versions of documents reasonably requested in connection with carrying out the objectives of this Agreement.

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

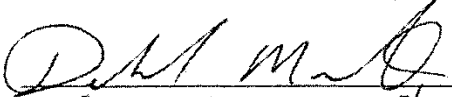
29. Entergy VY, PSD, ANR, and VDH each represent that it possesses the power and authority to execute, deliver and perform its obligations under this Agreement, which obligations are valid, binding, and enforceable under this Agreement.
30. This Agreement shall be binding on, and inure to the benefit of, the respective successors and assigns of Entergy VY, PSD, ANR, and VDH and, in any event, shall continue to be binding upon the Parties. Any Party may name a successor or assign its rights under this Agreement by providing notice to and receiving consent from the other parties pursuant to paragraph 25 of this Agreement, such consent not to be unreasonably withheld.
31. This Agreement and any referenced Exhibits hereto constitute the entire agreement between the Parties. This Agreement shall not be changed, modified or altered in any manner except by an instrument in writing executed by the Parties.
32. If any part of this Agreement is determined not to be valid, such provision shall be null and void and the remainder of the Agreement shall continue in full force and effect.
33. This Agreement is effective as of December 23, 2013.

IN WITNESS WHEREOF, the parties below enter into this Agreement as a sealed instrument. Each person signing this Agreement represents and warrants that he or she has been duly authorized to enter into this Agreement by the party on whose behalf it is indicated that the person is signing.

VERMONT PUBLIC SERVICE DEPARTMENT

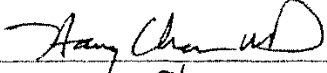
By: 
Name: CHRISTOPHER TRECCANI
Title: COMMISSIONER, PSD
Date: December 23, 2013

VERMONT AGENCY OF NATURAL RESOURCES

By: 
Name: Sec. Deb Markowitz
Title: Sec. ANR
Date: Dec 23, 2013


**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

VERMONT DEPARTMENT OF HEALTH

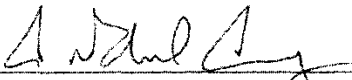
By: 
Name: Harry Chen
Title: Commissioner of Health
Date: 12/23/13

As to the terms of §§ 3(a)-(c) and 16 only and otherwise as to form:

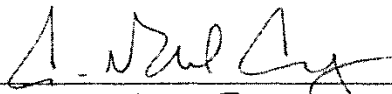
VERMONT OFFICE OF THE ATTORNEY GENERAL

By: 
Name: William H. Sorrell
Title: Attorney General
Date: 12/23/13

ENERGY NUCLEAR VERMONT YANKEE, LLC


By: 
Name: T. Michael Twomey
Title: VP- External Affairs
Date: December 23, 2013

ENERGY NUCLEAR OPERATIONS, INC.

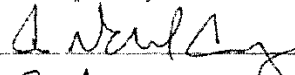
By: 
Name: T. Michael Twomey
Title: VP- External Affairs
Date: December 23, 2013

**Vermont Yankee Nuclear Power Station
Post-Shutdown Decommissioning Activities Report**

As to the terms of ¶ 10 only:
ENERGY CORPORATION

By: 
Name: Bill Moore
Title: President ENVC
Date: 12/20/13

As to the terms of ¶ 13 only:

By: 
Name: T. Michael Twomey
Title: VP. External Affairs ENVY
Date: December 23, 2013