COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC UTILITIES

Petition of NSTAR Electric Company and Western Massachusetts Electric Company each d/b/a Eversource Energy for Approval of an Increase in Base Distribution Rates for Electric Service Pursuant to G.L. c. 164, § 94 and 220 C.M.R. § 5.00	D.P.U. 17-05

DIRECT TESTIMONY OF
Vera L. Admore-Sakyi

Vegetation Management

On behalf of

NSTAR Electric Company and
Western Massachusetts Electric Company
each d/b/a Eversource Energy

January 17, 2017

DIRECT TESTIMONY OF

VERA L. ADMORE-SAKYI

I. INTRODUCTION

Q. Please state your name, position and business address.

A. My name is Vera L. Admore-Sakyi. I am Director, Vegetation Management for Eversource Energy Service Company ("Eversource Service Company" or "ESC"). My business address is 157 Cordaville Road, Southborough, MA 01772.

Q. In your current role, what are your principal job responsibilities?

A. As Director, Vegetation Management, I am responsible for the coordination and implementation of the vegetation management plan across all of the Eversource Energy electric operating companies, including NSTAR Electric Company ("NSTAR Electric"), Western Massachusetts Electric Company ("WMECO"), The Connecticut Light and Power Company and Public Service of New Hampshire. I oversee a staff of approximately 75 arborists and support staff in developing annual plans and managing the execution of the line-clearance programs. I am responsible for preparing the budget, coordinating outreach and coordinating communication of the program goals to various stakeholders. In this proceeding, I am testifying on behalf of NSTAR Electric and WMECO each d/b/a Eversource Energy (together "Eversource" or the "Company").

Q. Do you also have specific responsibilities in relation to Eversource's response to major emergency events?

A. Yes. In my role as Director, Vegetation Management, I am responsible for the overall management of vegetation crews during activation of the Emergency Response Plan ("ERP") in place in Connecticut and Massachusetts for Eversource's electric distribution companies. During an ERP event, the Vegetation Management unit has a range of responsibilities. These responsibilities include requesting and obtaining needed tree crews from vegetation contractors; developing and communicating mobilization schedules; managing the deployment of the crews and dispatching crews; and managing the completion of tree work that resulted from the ERP event.

After the storm event, my department is responsible for completing any follow-up work required as a result of the event, including conducting post-event patrols as necessary to identify any remaining tree damage; reviewing and approving invoices for storm work for payment to the vendors; and reviewing tree crew work sheets to determine if any portion of the tree work is subject to cost sharing with Verizon, based on applicable joint operating trimming agreements. My department is also responsible for identifying and developing documentation and invoicing for the specific locations on the system where storm-related vegetation management activities had a direct benefit for Verizon.

Q. Please summarize your education and professional experience.

A. I graduated from City University of New York City College in New York, New York in 1991 with a Bachelor of Engineering degree in Electrical Engineering, and from Worcester Polytechnic Institute in 2009 with a Graduate Certificate in Operations Management. I worked for Jersey Central Power & Light, a FirstEnergy electric distribution company serving approximately 1.2 million customers in Morristown, New Jersey from 1991 through 2005 in various positions of increasing responsibility, ending my tenure as Manager/Director of Regional Engineering. I joined NSTAR Electric Company in 2005 as Director, Project Management and, in 2007, moved to Director, Electric Field Operations. I transitioned into my current role as Director, Vegetation Management for Eversource Service Company in January 2013.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to present the Company's proposals relating to the vegetation management activities undertaken for system reliability and resiliency objectives on the Eversource distribution system in Massachusetts. Specifically, there are two proposals that the Company is making in relation to its system reliability and resiliency objectives. First, the Company is proposing to annualize the expense incurred during the test year for vegetation management work that the Company is performing to maintain service reliability in relation to day-to-day operations. My testimony below explains why this annualization is necessary and warranted.

Second, the Company is proposing a pilot program designed to accomplish a more rigorous level of vegetation work to achieve system resiliency objectives. The Company plans to commence this pilot work in 2017 on a limited basis. With the Department's approval, the Company would expand this work to full implementation as of January 1, 2018. The Company is requesting to recover the cost of this pilot program for 2017 and 2018 and beyond.

Lastly, my testimony provides an update on the Company's discussions with Verizon to negotiate a resolution of possible cost sharing for past storm events and presents the Company's request for cost recovery for amounts that cannot be collected from Verizon, despite all reasonable efforts of the Company.

Q. Why does the Company view it as a priority to consider a vegetation management pilot program to meet resiliency objectives in this case?

A. Eversource has a strong institutional commitment to the goal of providing a high level of service reliability to customers, which encompasses the objective of avoiding outages or restoring power after large-scale weather events as expeditiously as possible when those outages do occur. The Company has developed a longstanding track record of providing a high level of reliability in relation to day-to-day operations and the Company strives to implement measures to protect and improve its ability to meet or exceed day-to-day reliability objectives.

However, at the same time, industry practice is changing as it is becoming increasingly apparent that heightened investment in vegetation management activities is not only beneficial, but in fact, is vital in light of the climate-change impacts that are causing major weather events to become more severe and more frequent. As was demonstrated in the major events experienced in 2011 through 2013 timeframe, customers do not want to endure power outages, and certainly do not want to endure lengthy power outages. Changes in strategies for vegetation management can achieve an incremental level of system resiliency during major events. Although it would take very rigorous measures for the Company to harden the system to the degree necessary to repel storm damage using vegetation management techniques, achieving wider clearances and initiating a significant ramp-up of hazard tree removal will have an impact on the system's ability to be more resilient in severe storm conditions. Innovative vegetation management strategies become particularly effective when combined with distribution automation, which provides the Company with greater control over the system in severe weather events and allows restoration of power without manual intervention.

A heightened level of investment in vegetation management activities will enable the Company to accomplish wider clearances and stepped up hazard-tree removals on a system-wide basis in Massachusetts. The benefit of this investment will inure directly to the benefit of customers in the form of system reliability and resiliency, while serving as an important complement to the Company's grid-modernization investments. Moreover,

as explained below, the Department recently established a 10-year glide path to a more stringent benchmark for its Service Quality ("SQ") reliability metrics. Achieving increased performance on the Department's SQ reliability metrics will require innovation and investment given the high level of reliability that the system already provides. Therefore, the Company is putting forth a comprehensive proposal for the Department's consideration in this case.

Q. How is your testimony organized?

A. Section I is the introduction. Section II provides an overview of the test year vegetation management program conducted by the Company for reliability and resiliency purposes, including a description of program enhancements that were instituted in accordance with the Department's directives for NSTAR Electric in NSTAR Electric Company, D.P.U. 11-85-B/D.P.U. 11-119-B (2012), and for WMECO in Western Massachusetts Electric Company, D.P.U. 11-102/D.P.U. 11-102-A (2014). Section II also discusses and documents the actual test-year expenses incurred to demonstrate the program costs on an annualized basis. Section III of my testimony describes the Vegetation Management Resiliency Tree Work ("RTW") Pilot Program planned for 2017 – 2018, including a discussion of the program objectives. Section IV of my testimony discusses the status of negotiations with Verizon in relation to responsibility for storm-related vegetation management costs for prior major storm events, and presents the Company's request for cost recovery based on the outcome of these negotiations.

Q. Please describe the exhibits accompanying this testimony.

A. The exhibits accompanying this testimony are as follows:

Exhibit	Description
Exhibit ES-VLA-1	Testimony of Vera L. Admore-Sakyi
Exhibit ES-VLA-2	Eversource Vegetation Management Plan
Exhibit ES-VLA-3	NSTAR Electric DVM Plan
Exhibit ES-VLA-4	Summary of 2015 Vegetation Management Invoices
Exhibit ES-VLA-5	2015 Vegetation management Invoices

II. VEGETATION MANAGEMENT IN THE TEST YEAR

Q. In the test year, did Eversource manage vegetation work on a consolidated basis for the overall Massachusetts distribution system?

A. Yes. The Eversource electric distribution system in Massachusetts is comprised of the former operations of NSTAR Electric and WMECO. Both companies currently exist as individual, wholly owned subsidiaries of Eversource Energy. However, Eversource operates the legacy NSTAR Electric and WMECO electric distribution systems on a fully consolidated basis, with two geographic areas designated as "Eversource East" and "Eversource West." The planning and execution of vegetation work for Eversource East and Eversource West is managed on a consolidated basis.

In 2015, the Company merged its vegetation management activities for the Eversource system in Massachusetts into a unified plan, referred to as the "Eversource Maintenance

Program 5.60 Vegetation Management – Distribution Maintenance Program" (the "Eversource VM Program"). The Eversource VM Program incorporates both the provisions of the former NSTAR Electric Distribution Vegetation Management Plan ("DVM"), submitted to the Department on July 31, 2013, in compliance with the Department's directives in D.P.U. 11-85-B/11-119-B, and certain requirements arising out of WMECO's rate settlement in Western Massachusetts Electric Company, D.T.E. 06-55 (2007). A copy of the Eversource VM Program is provided as Exhibit ES-VLA-2. A copy of the former NSTAR Electric DVM is provided as Exhibit ES-VLA-3.

Although vegetation management is now conducted under a unified vegetation management plan, the work plan performed in Eversource East and Eversource West differs to a certain extent due to the fact that NSTAR Electric and WMECO conducted different vegetation management plans historically, prior to the merger of Northeast Utilities and NSTAR. As a result, the nature and scope of vegetation work achieved on the system historically is not the same between the two areas. With the proposals made in this case, the Company is looking to obtain the tools necessary to achieve a comparable level of vegetation control in the Eversource East and Eversource West areas, with the level of vegetation control that is achieved specifically designed to produce an incremental level of system reliability and resiliency for the overall system.

Q. What is the overall design of the vegetation management work performed under the Eversource VM Program?

A. The Eversource VM Program is structured as a comprehensive effort involving multiple departments and significant amounts of data analysis. The plan is coordinated on an individual circuit basis with Distribution Engineering to address identified reliability performance. The execution of the actual tree work is managed by Vegetation Management utilizing a staff of senior arborists, contract arborists and tree trimming and removal contractors. The program covers all primary wires, with scheduling occurring on the basis of a combination of performance and circuit-specific cycle-based trimming.

There are two aspects of the program. First, the program includes an established trim cycle to ensure that all circuits, regardless of current performance, are trimmed at least once in every four years, subject to circuit-specific considerations. The Company also uses reliability-based prioritization methods to identify the need for mid-cycle trimming or other corrective actions on a proactive basis to address poor performing distribution circuits or other factors affecting routine operations. Second, the Company conducts hazard tree removal through the program, which is coordinated with the cycle-pruning schedule. Hazard trees are identified and targeted for removal subject to obtaining appropriate consents for removal in accordance with state law. In addition, “risk” trees are identified on all circuits scheduled for cycle pruning and are targeted for removal. As reliability performance requires, profiling for risk and hazard tree removals are performed on “off-cycle” circuits to mitigate poor performing circuits.

Q. What are the program specifications?

A. The Vegetation Management department plans for all distribution circuits across Eversource East and Eversource West to be trimmed on a four-year cycle. The Company employs a minimum standard clearance specification for Scheduled Maintenance Trim ("SMT"), which is 8 x 8 x 12. This work is completed annually and is considered an operations and maintenance ("O&M") expenditure.

Q. Does Eversource also perform an enhanced level of vegetation management work?

A. Yes, in some areas. In the Department's final decision in D.P.U. 11-85-B/11-119-B, the Department directed NSTAR Electric to track hazardous tree removals separately from its vegetation program, including the number of hazardous trees removed as well as the associated cost (see D.P.U. 11-85-B/11-119-B at 134-135). The Department further directed NSTAR Electric to submit an updated vegetation management program for its distribution system to include: (1) a four- to five-year trim cycle at a minimum; and (2) a mechanism for tracking the number of hazard trees removed, with associated costs.

Therefore, beginning in 2012, NSTAR Electric changed its program in several ways to meet these directives. First, the number of miles scheduled for program pruning was increased so as to achieve a four-year cycle for all distribution circuits. Additionally, NSTAR Electric increased the clearance zone around the distribution primary by trimming to an "Enhanced Tree Trimming" or "ETT" specification on all primary sections of circuits, to the extent consent can be obtained from the respective municipal

tree warden. The Company also developed an "Enhanced Tree Removal" or "ETR" component to aggressively target the removal of risk and hazard trees to improve reliability. As appropriate, "blue sky" clearance was targeted for poor performing areas, if approved by municipal tree wardens, along with hot spot trimming as required mid-cycle. NSTAR Electric maintained a reliability-based component as required the Department. Lastly, NSTAR Electric created the Forestry Database as the mechanism for tracking the number of hazard trees removed, and the associated costs, by distribution circuit. The NSTAR Electric DVM incorporating these changes was submitted to the Department on July 31, 2013.

Q. What are the specifications of the ETT and ETR and how is it accounted for?

A. The ETT specification is 10 x 10 x 15, as compared to 8 x 8 x 12 for the SMT. ETR is conducted in parallel scheduled cycle miles. Priority is focused on identifying risk and hazard trees along the three-phase primary, or circuit backbone for removal. Single and two-phase lateral primary may be profiled for ETR if the area has been identified as poor performing. The expenditures for ETT are capitalized in the initial cycle implementing the procedure because the procedures have the effect of increasing the clearance "corridor" beyond the clearance achieved with the SMT. Therefore, the initial cycle of corridor-expanding work is treated as a capitalized improvement to the system rather than an operations and maintenance activity like the SMT (which is expensed). Beginning in 2016, circuits that were previously pruned to the ETT specification (10 x 10 x 15) in the

initial cycle will be maintained at that specification for the second cycle and beyond, rather than maintaining the clearance at the narrower SMT clearance. Maintaining the clearance at the wider clearance is considered an O&M expense, rather than a capitalized improvement after the first cycle.

Additionally, the Company performs mid-cycle pruning as needed for portions of circuits that experience a trend of interruptions between planned cycle prunes. The identified circuits are also patrolled to determine if additional ETR work beyond that performed in conjunction with the ETT is appropriate to mitigate outages and improve reliability.

Q. What is the difference in approach between the historical vegetation management work for Eversource East and Eversource West, particularly in relation to ETT and ETR?

A. Prior to 2015, the major difference in the programs conducted by Eversource East and Eversource West was that Eversource West performed full-scale (blue sky) ETT, including removals of all trees and limbs within the clearance zone as part of its vegetation management program on segments of the system. Specifically, Eversource West performed ETT on selected segments, and not the entire three-phase or backbone of a circuit (generally, only from the substation to the first sectionalizing device). The annual budget for Eversource West included a total of $2.5 million for both ETT and ETR, which allowed for approximately 25 miles of ETT work annually.

For Eversource East, ETT was performed on all primary sections of the circuit, as allowed by Tree Wardens and municipal officials. Prior to beginning to establish a cycle in 2012, distribution circuit pruning was prioritized and scheduled based on reliability performance. As a result, individual circuit "cycles" ranged from annually to more than 10 years. The ETT specification deployed in Eversource creates a significant visual impact and is significantly more costly per mile to achieve. In Eversource East, the Company adopted a strategy to minimize paying for "ground to sky" clearances that would not be approved by municipal officials. As a result, the Company cleared a minimum of 10 x 10 x 15 as approved and performed risk tree removal in parallel with the pruning operation. This allowed the Company to pay for the trees that were removed, versus paying for a specification that would not be approved by the town. The annual budget for Eversource East included a total of $14.5 million for both ETT and ETR, which allowed for approximately 1,850 miles of ETT work annually on average.

Q. Does the Company monitor the performance of its vegetation management contractors to ensure compliance with the Company's specifications?

A. Yes. The Company routinely audits all vegetation management work performed on the system and reviews contractor work for adherence to the standards for vegetation management. Arborists conduct field reviews of all work areas and document any areas of non-compliance by location, correlating the locations onto circuit maps for the East and West systems. This information is sent to the contractors performing the work and they are required to complete any necessary re-work in accordance with the standards. In

the event proper clearances have not been achieved, the contractor is responsible for re-trimming at no additional cost for a period of 12 months. The contractor is responsible to start any re-trimming within seven days of written notification and all work must be completed within 30 days. If the contractor does not start the work as required, the Company may hire an alternate contractor to complete the work and back charge the original contractor for the cost of performing the re-work.

Q. What was the amount of vegetation management work completed by the Company in the test year?

A. The Eversource East system encompasses approximately 7,946 miles of overhead primary miles. When overhead circuits are trimmed, all secondary circuits associated with the primary miles are also trimmed. In the test year, the Company trimmed 2,090 overhead circuit miles in the Eversource East area.

The Eversource West system encompasses approximately 3,270 miles of overhead primary miles. In the test year, the Company trimmed 874 overhead circuit miles in the Eversource West area.

Q. What were the ETT expenditures incurred by Company in 2015 and the test year for the Eversource East area.

A. Table ES-VLA-1, below, provides ETT expenditures for vegetation management in 2015 and for the test-year ending June 30, 2016, on the Eversource East system:

Table ES-VLA-1
Eversource East
ETT Expenditures

Year	ETT Costs ($, millions)
2015	$9.1
TYE June 30, 2016	$12.1

Q. What is the Company's proposal in this case in relation to the annualization of vegetation management expense?

A. As noted above, the expenditures for ETT are capitalized in the initial cycle implementing the procedure and expensed in the second cycle and beyond due to the difference between completing a capitalized improvement to the system (first round) and performing maintenance of an already widened clearance corridor (second round and beyond). Beginning in 2016, circuits that were previously pruned to the ETT specification (10 x 10 x 15) in the initial cycle will be maintained at that specification for the second cycle and beyond. Because this transition from capitalized improvement to expense is occurring as of January 1, 2016, the Company's test-year accounts will reflect only six months of expense in the test year ending June 30, 2016 (or approximately $5.3 million). Therefore, it is necessary to annualize this amount to capture the full cost of the cycle maintenance in rates.

The cycle work performed on the Eversource system in relation to vegetation management is performed exclusively by contractors. Therefore, to document this cost

on an annual, calendar year basis, the Company has compiled and reviewed the contractor invoices for all vegetation-management program expenditures for calendar year 2015 in Exhibit ES-VLA-4. Currently, the Company is in the process of finalizing the compilation of invoices for calendar year 2016. These invoices show that the total cost of the enhanced trimming vegetation management work was $9.1 million in 2015, and approximately $12.1 million during the split test-year ending June 30, 2016, which validates a test year cost of approximately $10.5 million, as discussed in the testimony of Company Witness Douglas P. Horton.

Accordingly, because the expense recorded on the Company's books in the test year is only approximately one-half of the actual level of expense actually incurred for either 2015 or the split test year ending June 30, 2016, the Company is requesting that the Department incorporate the annualization adjustment of approximately $5.3 million in the Eversource East base distribution rates in this proceeding.

III. VEGETATION MANAGEMENT RESILIENCY TREE WORK PILOT PROGRAM

Q. What is the Company's perspective on the importance of implementing a Vegetation Management RTW Pilot Program?

A. There are two fundamental reasons that the Department should approve implementation of the Company's proposed Vegetation Management RTW Pilot Program. First and foremost, although the Company has long taken proactive steps to enhance and protect its distribution system, Eversource's system infrastructure is unavoidably exposed to

weather events, and vulnerable in the types of harsh conditions that occur with ice storms, heavy wet snow, tropical storms, hurricanes and other wind events causing substantial damage and prolonged power interruptions. These types of events are becoming more frequent and more severe due to climate change impacts and the Company needs to take steps beyond historical practice to address this trend.

Second, resilient grid infrastructure is necessary as a foundation for an increasingly modernized grid. Without a resilient grid, real-time sensing and monitoring investments made as part of a grid-modernization program are rendered moot, since the grid would be lacking sufficient foundation to optimize the use of the modern technology. Certain upgrades and reinforcements to the electric system are necessary to optimize the value and functionality of other investments, including more rigorous vegetation management activities.

Eversource views enhanced tree-trimming including areas of ground-to-sky clearing to be a critical-path strategy to achieve a greater level of system resiliency. Beginning in 2012, the Company commenced an initiative to perform ETT, clearing a 10 foot x 10 foot x 15 foot zone around the primary distribution lines, wherever possible. This enhanced zone provides improved reliability performance on blue-sky days, and more resilience under adverse weather conditions. There is substantial work remaining on the Eversource system to implement ETT and ETR on a system-wide basis, which would provide significant benefits to customers in the form of reliability and resiliency.

Beginning in 2016, the Company will begin the second cycle of ETT clearance and will preserve the enhanced clearance zone along all primary sections of circuits that were trimmed to the ETT specification between 2012 and 2015. The Company cleared approximately 7,445 miles at this wider clearance during the period 2012 through 2015 in Eversource East. During this same period, approximately 138 miles were cleared at this enhanced standard in Eversource West. This clearance level is in addition to performing the standard clearance on the program miles and this specification is much greater than the Company's routine maintenance specification, as it calls for clearing all overhanging limbs and/or trees.

Circuits are identified through historical reliability data, and layered over the maintenance cycle to achieve efficiencies. When circuit backbones are trimmed to this specification there is a dramatic change in the aesthetics of the roadside forest along with a commensurate improvement in reliability. There is an opportunity to perform enhanced clearing on a broader population of circuits in Eversource West. There are more than 500 miles of three-phase-primary backbone that would benefit from enhanced clearing not performed in the past. Due to its more rural nature, there are also more than 2,800 miles of lateral primary that would benefit from enhanced clearing.

Q. What is the Company's proposal for the Vegetation Management RTW Pilot Program?

A. The Company is proposing to implement a pilot program for 2017 and 2018 to complete resiliency tree work that will include expanded application of ETT, hazard and risk-tree removals and additional mid-cycle pruning. The pilot will commence in 2017 as a proof of concept, with an expansion of the initiatives in 2018 based on the Company's experience. As described below, the initiatives are strategically planned to complement existing tree work and with a focus on improving reliability and storm resiliency.

Q. Would you please describe the anticipated pilot program initiatives for 2017?

A. The Company is planning two Vegetation Management RTW Pilot initiatives for the pilot program in 2017 to enhance the current vegetation management program, specifically with respect to mid-cycle pruning. As described earlier, the current program includes mid-cycle pruning, which is a reliability-based strategy deployed to address emerging poor performing circuits and "hot spots." The Vegetation Management unit coordinates reliability-based mid-cycle pruning with Distribution Engineering and with input from Electric Field Operations and Electric Service.

For the mid-cycle prune in 2017, the Company will deploy a mobile Light Imaging, Detection and Ranging (LiDAR) unit to patrol and inspect distribution primary on selected poor performing circuits to identify sections and locations where mid-cycle pruning is warranted.

The deployment of the mobile LiDAR unit will facilitate a more efficient and accurate assessment of mid-cycle clearance conditions. Software will be used to analyze the measured distances between trees and the primary facilities, based on criteria established by the Company. The analysis output will identify and categorize the inspection results into high-medium-low priority. The software will allow the Vegetation Management arborist to view photographs of the conditions to aid in their final decision of priority. Follow up maintenance orders are created and scheduled so that the clearance issues can be addressed proactively, in contrast to waiting for a pattern of interruptions to emerge. This transforms the mid-cycle prune program into a routine and proactive preventive maintenance activity, and mitigates future interruptions. The Vegetation Management RTW Pilot effort will focus on backbones and selected laterals with high customer counts or critical facilities, as well as locations where towns have placed restrictions on vegetation clearance. The Vegetation Management department will work with Distribution Engineering and Community Relations to obtain approvals for increased clearance along three-phase sections identified from municipal officials.

Q. Have you developed a cost estimate for these enhancements in 2017?

A. Yes. The Vegetation Management RTW Pilot program enhancements in 2017 will include LiDAR inspection and analysis, mid-cycle pruning in areas identified by such analysis, as well as software and hosting fees, as follows:

Table
ES-VLA-5
2017 RTW Pilot Summary

Activity	Estimated Cost
LiDAR Inspection	$476,000
LiDAR Analysis	$100,000
Mid-Cycle Prune	$2,875,000
Software and Hosting	$70,000
Total 2017 Expense	$3,521,000

Q. Will the pilot program include additional enhancements in 2018?

A. Yes. Following the 2017 proof of concept, the Company is planning additional pilot program enhancements in 2018 with respect to Vegetation Management RTW Pilot, including increased mid-cycle pruning activity, RTW tree trimming activities, and RTW tree removals ("RTR"). The proposed activity for the RTW Pilot for 2018 and beyond is summarized in the table below.

Q. Have you developed a cost estimate for these enhancements in 2018?

A. The values in the table reflect the vegetation management activity that will be performed by vegetation crews along with the estimated cost.

Table ES-VLA-6
2018 RTW Pilot Summary

Activity	Estimated Cost
Enhanced Mid-Cycle Prune	$4,720,000
Resiliency Tree Work (RTW)	$5,000,000
Expanded Hazard Tree Assessment & Removal (RTR)	$15,050,000
Annualized Cost of One Time Study Expenses	$1,180,000
Total 2018 Expense	$25,950,000

Q. Please describe the RTW tree trimming work that would be completed as part of the Vegetation Management RTW Pilot program in 2018.

A. Eversource West has historically targeted 25 miles of backbone circuits for ETT trimming on an annual basis. In 2018, as part of the Vegetation Management RTW Pilot program initiative the Company will inspect, evaluate and target all hazard and risk trees within the fall zone for elimination by either pruning or removal. There are approximately 868 three-phase miles in the Eversource West territory, and through the end of 2016, approximately 300 miles have been cleared to ETT specifications. For the Vegetation Management RTW Pilot pilot-program initiative in 2018, the Company would extend ETT RTW trimming clearing to include selected laterals serving 100 customers or greater, or that serve critical infrastructure needs for cities and towns that have a history of tree-caused interruptions. The annual target will be increased from 25 miles to 100 miles.

Q. Please describe the enhancements for hazard and risk tree removal in 2018 as part of the Vegetation Management RTW Pilot initiative.

A. Trees in Massachusetts have been subjected to several environmental stressors in recent years, including the emerald ash borer ("EAB"), cynid wasps and gypsy moths. The Massachusetts Department of Conservation and Recreation Forest Health Program reports that aerial surveys performed in 2015 and 2016 indicate a 924 percent increase in acres of damage caused by gypsy moths. Additionally, some portions of Massachusetts have been classified as extreme drought status, and the long-term effects of drought can include the dieback of branches and death of trees. Drought related stress can also make trees more susceptible to disease infections and insect invasion as their ability to ward off these problems is compromised.

Under the current tree removal program, the Company patrols the three-phase primaries of scheduled circuits in conjunction with the cycle prune schedule. Arborists are focused on identifying the hazard trees that present an imminent threat to the distribution system. Resources are focused on the three-phase lines, as tree-caused interruptions on these lines have the potential to impact a higher number of customers.

If implemented in 2018 following the Department's approval in this case, the Company plans to undertake an aerial LiDAR inspection of the entire service area in Massachusetts in order to catalog tree density and proximity to distribution facilities. Additionally, the Company will commission a study by an independent third-party to survey the service

areas and perform a condition assessment of the trees in proximity to the distribution system. This analysis will provide the basis to strategically improve the effectiveness of the tree-removal program by quantifying the projected workload, and providing a prioritization method to extend the patrol beyond the three-phase to identify more trees that present a level of risk to the circuit reliability. This information would also be used to prioritize the locations for annual hazard and risk tree assessment in accordance with the scheduled maintenance prune. The total cost of these two studies is estimated to be $5.9 million. Therefore, in order to capture the appropriate level of annualized expenses in the Vegetation Management RTW Pilot costs, the Company has reflected the amortized costs over 5 years in Table ES-VLA-6, above ($5.9 million / 5 years =$1.18 million).

Q. Please describe the planned Vegetation Management RTW Pilot enhancements to mid-cycle pruning in 2018.

A. In 2018, the Company will deploy mobile LiDAR units to patrol and inspect worst performing circuits and distribution primaries approximately two years after maintenance pruning. This will be performed proactively to identify sections and locations where the vegetation clearances would benefit from hot spot pruning. The identified sections and locations will be prioritized and addressed in a programmatic way.

Currently, mid-cycle pruning is performed by the Company on a reactive basis. As a performance trend is identified, the Company will prescribe mid-cycle pruning as a triage

strategy to improve performance. Under this pilot program initiative in 2018, circuits will be scheduled automatically for a LiDAR survey, regardless of current performance. This initiative is intended to proactively remove vegetation that threatens overall circuit performance. Specifically, the work will be organized to achieve the Department's priorities:

- Tree-related field conditions;
- Customer count;
- Miles of each circuit;
- Presence of scenic roads or other vegetation management restrictions; and
- Critical infrastructure needs for the served cities and towns.

By deploying LiDAR technology in this manner, the Company will be able to measure and analyze vegetation clearances more objectively, thereby ensuring consistency in the application of the specifications. This initiative will also provide a record of clearance issues that can be shared with municipal officials, customers and other stakeholders.

Q. How is the Company proposing to implement the Vegetation Management RTW Pilot between the NSTAR Electric and WMECO service territories?

A. The Company is proposing to implement the pilot as a single, consolidated program, as NSTAR Electric and WMECO are fully integrated from a management and operational perspective. The Company's proposal for recovery of pilot program costs, as well as the split between NSTAR Electric and WEMCO customers, in 2017 and 2018 is discussed in the testimony of Company Witness Douglas P. Horton and his accompanying Exhibit ES-DPH-3 (East), WP-DPH-15.

Q. Please describe why the Company is proposing to implement a single, consolidated pilot program versus two pilot programs for the East and the West?

A. As previously mentioned, the Vegetation Management team in the East and West is consolidated under the same Manager and supporting structure. A single program would operate under a single set of guidelines, priorities, and protocols so that resources are efficiently and effectively deployed to address system priorities. This would also facilitate the shifting of resources, if necessary, to respond to emergent issues that may arise. From a vendor management perspective, it also allows the Company to leverage any collective magnitude of scale, and not have an East and West pilot programs competing against each other for resources.

IV. VERIZON COST SHARING

Q. Would you please summarize the status of the actions the Company has taken in relation to potential attribution of vegetation management costs to Verizon?

A. As described in more detail below, the Company has worked diligently to obtain a resolution with Verizon regarding cost responsibility for vegetation management work under their joint operating agreements ("JOA"). Verizon has steadfastly held that it does not have a need for the Company to perform vegetation management activities on its behalf, and it will not agree to cost sharing except for in very limited circumstances. As part of this effort, the Company has engaged in extensive negotiations with Verizon on the basis of invoices issued to Verizon for the cost of vegetation work associated with prior storm events. In total, NSTAR Electric issued invoices to Verizon totaling $7.1

million and WMECO issued invoices totaling $1.05 million. The negotiations hit a final impasse in 2016 with Verizon having terminated one of its JOAs with NSTAR Electric and refusing to bear any portion of these costs.

Q. Is it your opinion that the Department has established a reasonable basis for attribution of storm-related vegetation management costs to Verizon?

A. No, it has not. It is extraordinarily difficult at this point to obtain Verizon's cooperation in discussing possible resolutions to the cost-sharing issue because the Department has held that electric companies should pursue Verizon for amounts that it is "contractually obligated to pay under the terms of the JOA."[1] However, the Department has then also held that it will not interpret the terms of the JOAs, but also that the amount contractually due from Verizon is 50 percent of the storm-related vegetation management costs, which is not supported by the terms of the JOAs. The terms of the JOAs do not obligate Verizon to pay 50 percent of the Company's *total* vegetation costs incurred in a heavy storm event. Because the Department has established an internally inconsistent standard with an absurd, costly impact for Verizon, it is very difficult for the Company to engage Verizon in productive discussions.

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[1] Western Massachusetts Electric Company, D.P.U. 13-135 at 41 (2016) (citing, Western Massachusetts Electric Company, D.P.U. 11-102/11-102-A at 101 (2012); Fitchburg Electric Light Company d/b/a Unitil, D.P.U. 11-01/11-02, at 50, 56 (2011); Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid, D.P.U. 11-56, Interlocutory Order at 5; (2012); Western Massachusetts Electric Company, D.P.U. 10-70, at 68 (2011); Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid, D.P.U. 09-39, at 212-213 (2009)).

Q. Has the Department recognized that Verizon's obligation under the JOA is location-specific, i.e., tied to a specific location where its facilities are directly benefitted?

A. Yes. In D.P.U. 11-102/11-102-A, the Department expressly acknowledged that WMECO had explained its billing practice for Verizon cost sharing was designed to align with the terms of the JOA. See, e.g., D.P.U. 11-102/11-102-A at 95-97. The specific evidence in D.P.U. 11-102/11-102-A showed that the Company's practice is to track locations on the system where Verizon received a demonstrable benefit from the Company's storm-related vegetation management work and to charge Verizon for 50 percent of the work costs at those specific locations. D.P.U. 11-102/11-102-A at 96. In its decision, the Department found that WMECO provided adequate evidence of its "reasonable and prudent efforts to seek recovery from Verizon for a portion of vegetation management costs for all eleven storm events." D.P.U. 11-102/11-102-A at 102. Therefore, this decision validated that WMECO's practice was reasonably designed to apportion costs to Verizon consistent with the terms of the JOA.

Q. How do these terms apply to the attribution of costs by WMECO to Verizon in practice?

A. WMECO's work practice has been in place for a long period of time and was specifically designed to carry out the terms of the JOA in relation to 50/50 cost sharing of storm-related vegetation management costs. WMECO's work practice generates location-specific information on vegetation clearing and identifies the Verizon facilities receiving a benefit. The time-sheet documentation generated for each location allows WMECO to

quantify costs and properly attribute 50 percent of those costs to Verizon at the specific affected locations. The Department's acceptance of this work practice in D.P.U. 11-102/11-102-A as a "reasonable and prudent" methodology for attributing costs to Verizon was appropriate because the amounts billed to Verizon are directly correlated to the benefit Verizon received.

Q. How has NSTAR Electric adapted its approach to align with the Department's directives on the attribution of costs to Verizon?

A. The Department's decision in D.P.U. 13-52 was issued on December 30, 2013. Following that decision, NSTAR Electric adopted the work practices in place on the WMECO system for attributing storm-related vegetation work costs to Verizon. This new work practice was implemented for storms occurring in 2014 and 2015. The Department's decision in D.P.U. 11-102/11-102-A validating the work-practice was issued December 5, 2014; however, NSTAR Electric had already adopted the work-practice as a reasonable and prudent alternative for more closely tracking costs attributable to Verizon under the JOA.

Q. Has the Company engaged in reasonable and prudent efforts to seek recovery from Verizon for that portion of vegetation management costs attributable to Verizon under the JOA?

A. Yes. Over the course of more than 10 years, NSTAR Electric has met with Verizon innumerable times to discuss vegetation management issues and to obtain Verizon's agreement to bear the costs of vegetation management work. In these meetings, Verizon

has consistently stated to NSTAR Electric representatives that it does not have a need for NSTAR Electric to perform vegetation management activities on its behalf, and that it will not agree to cost sharing.

As a result of the Department's decision in D.P.U. 13-52, NSTAR Electric issued invoices to Verizon on April 30, 2014, totaling $3.1 million. This amount represents 50 percent of the Company's total vegetation costs for the relevant storm events, which was denied for recovery by the Department in D.P.U. 13-52. On July 8, 2014, Verizon rejected the invoices. On July 31, 2014, NSTAR Electric issued a second set of invoices totaling $4.0 million representing 50 percent of the total cost of vegetation work associated with the four storm events that occurred in 2012 and 2013. On August 5, 2014, Verizon notified NSTAR Electric that it would not consider payment of these invoices outside of a discussion to modify the terms of IOP-J on a going forward basis. On September 4, 2014, NSTAR Electric's vegetation management team met with Verizon to review issues and discuss a potential resolution to the outstanding issues associated with storm-related vegetation work. No agreement was reached as a result of this meeting. On December 19, 2014, Verizon notified NSTAR Electric of its decision to exercise its right to terminate IOP-J for the Boston Edison Company JOA (one of two JOAs between NSTAR Electric and Verizon). The Company has no recourse to the notice of termination. The terms of the IOP-J allowed Verizon to terminate the agreement.

On March 27, 2015, Verizon advised NSTAR Electric in writing that Verizon's position had not changed and that it is not liable for the $7.1 million that was invoiced for storm work. On the basis of this position, Verizon made a settlement offer. Verizon also offered to meet with NSTAR Electric representatives to again explain why it is not responsible for claims under the various tree-trimming agreements.

On April 23, 2015, representatives from both companies, including legal counsel, met in Westwood, Massachusetts to attempt to settle the outstanding invoices. Verizon indicated that it did not benefit from NSTAR Electric's tree-clearance activities because their service is not interrupted during these events. Since this meeting, NSTAR Electric and Verizon have exchanged offers, with the last counter-offer made by NSTAR Electric in January 2016. Verizon has not yet responded to this counter-offer, but indicated to the Company that the labor contract would require their attention over 1st and 2nd quarter. On June 16, 2016, NSTAR Electric contacted Verizon to inquire as to the status of settlement discussions NSTAR Electric has not yet received any response. The negotiations hit a final impasse with Verizon refusing to bear any portion of these costs.

In total, NSTAR Electric has invoiced Verizon for approximately $7.1 million for storm events occurring in the 2011-2013 time period. No payment is forthcoming on these amounts. WMECO has billed a total of $1.1 million to Verizon for storm-related vegetation work in the years 2008-2013. Although Verizon had previously indicated

agreement to pay at least a portion of these costs, no payment to WMECO is forthcoming.

Q. Is there any reasonable prospect for recovery of the disputed costs from Verizon?

A. No. At this time, the Company has pursued all reasonable and prudent options for recovery of these costs from Verizon.

Q. Is the Company requesting recovery of these costs in rates?

A. Yes. As described in the testimony of Company Witness Horton, NSTAR Electric has included a proposal to recover outstanding and disputed balances for both NSTAR Electric and WMECO as of December 31, 2017, over a period of five years. The Company requests that the Department approve recovery of the portion of costs attributable to Verizon, but for which the Company has not been able to reach a negotiated settlement for both NSTAR Electric and WMECO for storm events occurring in the 2011-2013 time period unpaid by Verizon.

At the time of this filing, the Company continues to attempt to reach a mutually agreeable resolution. The Company is hopeful that it will be able to come to terms with Verizon early in this proceeding, which will result in Verizon sharing an appropriate level of storm-related vegetation management costs. However, it is clear from numerous discussions that Verizon will not agree to share the full amount of vegetation management costs billed to Verizon to date. Therefore, assuming the Company is able to

reach resolution, the Company anticipates including the remaining balance of unrecovered vegetation management attributable to Verizon in the amount of storm costs for both WMECO and NSTAR Electric to be recovered effective January 1, 2018.

Q. Does this conclude your testimony?

A. Yes, it does.