COMMONWEALTH OF MASSACHUSETTS
ENERGY FACILITIES SITING BOARD

Petition of NSTAR Electric Company d/b/a Eversource Energy for Approval to Construct a New 115 kV Overhead Transmission Line in Walpole, Sharon Canton, Stoughton, Avon, Randolph, and Holbrook; a New Switching Station in Sharon; and to Make Modifications to Existing Substations in Walpole and Holbrook, Massachusetts, pursuant to G.L. c. 164, §69J	EFSB 14-2
Petition of NSTAR Electric Company d/b/a Eversource Energy for Approval to Construct, Operate, and Maintain a New 115 kV Overhead Transmission Line in Walpole, Sharon, Canton, Stoughton, Avon, Randolph, and Holbrook, Massachusetts pursuant to G.L. c. 164, § 72	D.P.U. 14-73
Petition of NSTAR Electric Company d/b/a Eversource Energy for Individual Zoning Exemptions and Comprehensive Zoning Exemptions from the Zoning Bylaws of the Towns of Walpole, Sharon, and Holbrook, Massachusetts, pursuant to G.L. c. 40A, § 3	D.P.U. 14-74

FINAL DECISION

Stephen H. August
Presiding Officer
September 20, 2017

On the Decision:
Ashley Ferrer
Enid Kumin

APPEARANCES: Catherine Keuthen, Esq.
Cheryl Blaine, Esq.
Keegan Werlin LLP
265 Franklin Street
Boston, MA 02110
FOR: NSTAR Electric Company d/b/a
Eversource Energy
Petitioner

David A. DeLuca, Esq.
Lauren C. Galvin, Esq.
Murphy, Hesse, Toomey & Lehane, LLP
300 Crown Colony Drive, 4th Floor
Quincy, MA 02169
FOR: Town of Holbrook
Intervenor

Lawrence E. Sandberg
2 Saw Mill Pond Road
Sharon, MA 02067
Intervenor

Michael J. Lang
60 Canton Street
Sharon, MA 02067
Intervenor

Nancy Munroe
209 Pine Street
Stoughton, MA 02072
Intervenor

Elaine M. Hyland
33 Damon Avenue
Holbrook, MA 02343
Intervenor

TABLE OF CONTENTS

I. INTRODUCTION 1
A. Summary of the Proposed Transmission Project 1
B. Procedural History 2
II. JURISDICTION AND STANDARD OF REVIEW 6
III. NEED ANALYSIS OF THE PROPOSED PROJECT 7
A. Standard of Review 7
B. Description of the Existing 115 kV Transmission Infrastructure 8
C. Description of the Company's Demonstration of Need 8
1. Greater Boston Area Transmission Needs Assessment 9
2. Greater Boston Area Solutions Study 15
D. Analysis and Findings on Need 16
IV. ALTERNATIVE APPROACHES TO MEETING THE IDENTIFIED NEED 17
A. Standard of Review 17
B. Identification of Transmission Alternative Approaches for Analysis 17
1. Transmission Alternative 1 (the Proposed Project) 18
2. Transmission Alternative 2 18
3. Transmission Alternative 3 19
4. Transmission Alternative 4 19
5. Transmission Alternative 5 19
6. Transmission Alternative 6 20
7. Transmission Alternative 7 20
8. Company's Comparison of the Alternatives 21
C. Identification of Non-Transmission Alternatives for Analysis 26
1. Non-Transmission Alternatives to the Proposed Sharon Switching Station 26
2. Non-Transmission Alternatives to New 115 kV Line 26
D. Analysis and Findings on Alternative Approaches 27
1. Reliability 27
2. Environmental Impacts 29
3. Cost 30
4. Conclusion 30

V. ROUTE SELECTION 32
A. Standard of Review 32
B. The Company's Route Selection Process 32
C. Geographic Diversity 35
D. Switching Station Selection Process 35
E. Analysis and Findings on Route Selection 37
VI. ANALYSIS OF THE PRIMARY AND NOTICED ALTERNATIVE ROUTES 38
A. Standard of Review 38
B. Description of the Primary and Noticed Alternative Routes 39
1. Primary Route 39
2. Noticed Alternative Route 40
3. Sharon Switching Station 41
C. Environmental Impacts 41
1. Land Use and Historic Resource Impacts 41
2. Visual 47
3. Wetland and Water Resource Impacts 50
4. Noise Impacts 55
5. Traffic 61
6. Air 64
7. Potentially Hazardous Materials and Solid Waste Impacts 67
8. Safety 70
9. Magnetic Fields 71
10. Summary of Environmental Impacts 79
D. Cost 79
E. Reliability 80
F. Conclusion 80
VII. STOUGHTON SWITCHING STATION 81
A. Introduction 81
B. Visual 82
C. Water 84
D. Analysis and Conclusion 85

VIII. CONSISTENCY WITH POLICIES OF THE COMMONWEALTH 87
A. Standard of Review 87
B. Analysis and Findings 87
1. Health Policies 87
2. Environmental Protection Policies 87
3. Resource Use and Development Policies 89
IX. ANALYSIS UNDER G.L. C. 40A, § 3 - ZONING EXEMPTIONS 89
A. Standard of Review 90
B. Public Service Corporation 91
1. Standard of Review 91
2. Analysis and Conclusion 92
C. Public Convenience or Welfare 92
1. Standard of Review 92
2. Analysis 93
D. Individual Exemptions Required 93
1. Standard of Review 93
2. Exemptions Sought 94
3. Consultation with the Municipality 96
4. Analysis and Findings 97
5. Conclusion on Request for Individual Zoning Exemptions 97
E. Comprehensive Zoning Exemptions 98
1. Standard of Review 98
1. Company Position 98
2. Analysis and Findings 99
X. ANALYSIS UNDER G.L. C. 164, § 72 100
A. Standard of Review 100
B. Analysis and Conclusion 101
XI. SECTION 61 FINDINGS 101
XII. DECISION 102

ABBREVIATIONS[1]

Berkshire Power	Berkshire Power Development, Inc., D.P.U. 96-104 (1997)
Boston Gas	Boston Gas Company, D.T.E. 00-24 (2001)
BVW	bordering vegetative wetland
Cape Wind	Cape Wind Associates LLC and Commonwealth Electric Company d/b/a NSTAR Electric, EFSB 02-2 (2005)
CELT	Capacity, Energy, Loads, and Transmission
CMR	Code of Massachusetts Regulations
CO_2	carbon dioxide
Company	NSTAR Electric Company d/b/a Eversource Energy
dBA	A-weighted decibels
DCR	Massachusetts Department of Conservation and Recreation
DCT	Double-circuit tower
Department	Massachusetts Department of Public Utilities
DG	distributed generation
DOMSB	Decisions and Orders of Massachusetts Energy Facilities Siting Board
DOMSC	Decisions and Orders of Massachusetts Energy Facilities Siting Council
DR	demand response
EE	energy efficiency
EIR	Environmental Impact Report
EJ	environmental justice

[1] The citations in this Decision to past Siting Board decisions reference the page numbers to be found in the original decisions rather than the page numbers in the DOMSC and DOMSB volumes. DOMSC and DOMSB citation references are provided only the first time that a case is mentioned in the Decision.

EMF	electric and magnetic fields
EFSB	Massachusetts Energy Facilities Siting Board
FCA	Forward Capacity Auction
Footprint	Footprint Power Salem Harbor Development LP, 19 DOMSB 151; EFSB 12-2 (2013)
Footprint Certificate	Footprint Power Salem Harbor Development LP, 19 DOMSB 280; EFSB 13-1 (2014)
FCM	Forward Capacity Market
GHG	greenhouse gas
G.L. c.	Massachusetts General Laws chapter
GSRP	Western Massachusetts Electric Company, 18 DOMSB 7; EFSB 08-2 /D.P.U. 08-105/ 08-106 (2010)
GWSA	Global Warming Solutions Act
Hampden County	New England Power Company d/b/a National Grid, 18 DOMSB 323; EFSB 10-1/ D.P.U. 10-107/ 10-108 (2012)
HCA	Host Community Agreement
IRP	New England Power Company d/b/a National Grid, 20 DOMSB 1; EFSB 12-1 /D.P.U. 12-46/ 12-47 (2014)
ISO-NE	ISO New England
IVM	Integrated vegetation management program
kV	kilovolts
LSP	licensed site professional
Lower SEMA	NSTAR Electric Company, 19 DOMSB 1; EFSB 10-2/D.P.U. 10-131/ 10-132 (2012)
LTE	long-term emergency rating
MassDEP	Massachusetts Department of Environmental Protection
MassDOT	Massachusetts Department of Transportation

MEPA	Massachusetts Environmental Policy Act
MCP	Massachusetts Contingency Plan
MF	magnetic field
MECo/Westford	Massachusetts Electric Company, D.T.E. 01-77 (2002)
mG	milligauss
MHC	Massachusetts Historical Commission
MODF	mineral oil dielectric fluid
MVA	megavolt-amperes
MVRP	New England Power Company d/b/a National Grid, D.P.U. 15-44/15-45 (2016)
MW	megawatts
MWh	megawatt-hours
Mystic/Woburn	NSTAR Electric Company d/b/a Eversource Energy, EFSB 15-03/D.P.U. 15-64/15-65 (2017)
NERC	North American Electric Reliability Corporation
NHESP	National Heritage and Endangered Species Program
NPCC	Northeast Power Coordinating Council
NPDES	National Pollutant Discharge Elimination System
NRG	NRG Canal 3 Development LLC, EFSB 15-06/D.P.U. 15-180 (2017)
NY Central Railroad	New York Central Railroad v. Department of Public Utilities, 347 Mass. 586 (1964)
Project	Walpole Holbrook transmission line
PSC	Public Service Corporation
ROW	right-of-way
Russell	Russell Biomass, LLC, 17 DOMSB 1; EFSB 07-4/D.P.U. 07-35/ 07-36 (2009)

Salem Cables	New England Power Company d/b/a National Grid, 20 DOMSB 129; EFSB 13-2/D.P.U. 13-151/13-152 (2014)
Section 72 Petition	Eversource petition pursuant to G.L. c. 164, § 72
SF_6	sulfur hexafluoride
Siting Board	Massachusetts Energy Facilities Siting Board
Siting Board Petition	Eversource petition pursuant to G.L. c. 164 § 69J
Stoughton/Boston	Boston Edison Company d/b/a NSTAR Electric, 14 DOMSB 233; EFSB 04-1/ D.T.E. 04-5/04-7 (2005)
Town of Truro	Town of Truro v. Department of Public Utilities, 365 Mass. 407 (1974)
TCP	Traffic Control Plan
ULSD	ultra-low-sulfur diesel
USEPA	United States Environmental Protection Agency
VMP	vegetative management program
WHO	World Health Organization
Woburn Substation	NSTAR Electric Company d/b/a Eversource Energy, D.P.U. 15-85 (2016)
Worcester	New England Power Company d/b/a National Grid, 18 DOMSB 173; EFSB 09-1 /D.P.U. 09-52/ 09-53 (2011)
Zoning Petition	Eversource petition pursuant to G.L. c. 40A § 3

Pursuant to G.L. c. 164, § 69J, the Massachusetts Energy Facilities Siting Board ("Siting Board" or "Board") hereby approves, subject to the conditions set forth below, the Petition of NSTAR Electric Company d/b/a Eversource Energy ("Company" or "Eversource") to construct an overhead 115 kilovolt ("kV") transmission line on an existing Company right-of-way in Walpole, Sharon, Canton, Stoughton, Avon, Randolph, and Holbrook, Massachusetts. Pursuant to G.L. c. 14, § 72, the Siting Board hereby approves, subject to the conditions set forth below, the Petition of Eversource for a determination that the proposed 115 kV transmission lines are necessary, serve the public convenience, and are consistent with the public interest. Pursuant to G.L. c. 40A, § 3, the Siting Board hereby approves, subject to the conditions set forth below, the Petition of Eversource for individual and comprehensive exemptions from the Zoning Ordinances of Sharon, Walpole, and Holbrook, Massachusetts in connection with the proposed transmission facilities, as described herein.

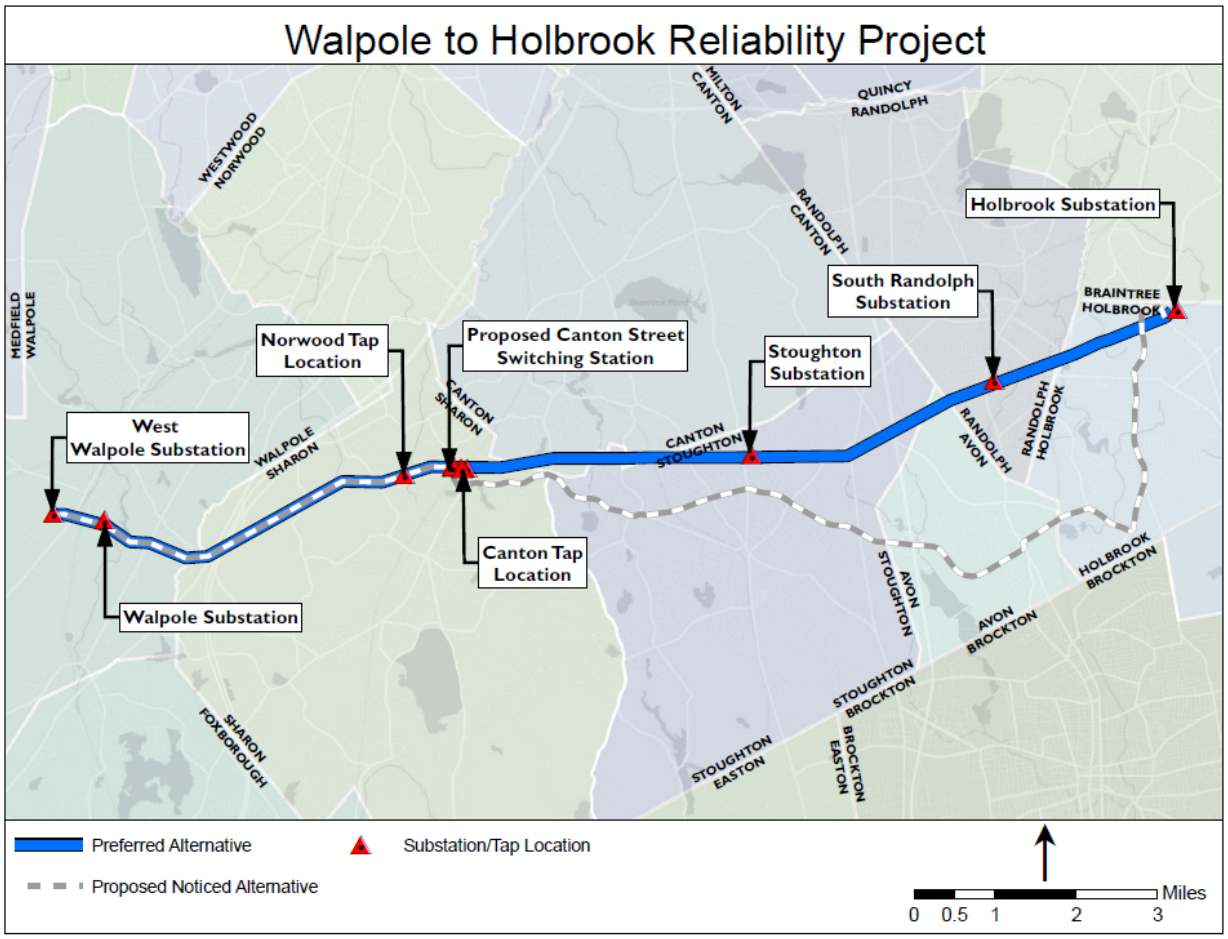
I. INTRODUCTION

A. Summary of the Proposed Transmission Project

The proposed project, known as the Walpole to Holbrook Reliability Project ("Project"), consists of a new 14.7-mile 115 kV overhead transmission line on an existing Company right-of-way ("ROW") between the Walpole Substation and the Holbrook Substation (Exh. EV-2, at 5-7 to 5-8). The Project would use existing transmission structures that currently support a 345 kV line, traveling through Walpole, Sharon, Canton, Stoughton, Avon, Randolph, and Holbrook (id.). In addition to the new transmission line, the Project includes: (1) separating the existing 0.64-mile double-circuit tower ("DCT") configuration of two 115 kV transmission lines between the Company's West Walpole and Walpole Substations; (2) constructing a new 115 kV switching station on Company property in Sharon ("Sharon Switching Station"); and (3) upgrading existing substations in West Walpole and Holbrook (Exh. EV-2, at 3-3R2). The Sharon Switching Station would consist of the following elements: (1) three 115 kV gas-insulated circuit breakers; (2) a prefabricated control shelter, approximately 70 feet by 15 feet in area and approximately 14 feet high; and (3) related site work to provide lighting, site access, foundations, and underground raceway and grounding systems (Exh. EV-2, at 3-4R2). The estimated cost of the Project, based on a planning grade cost estimate (i.e., -25 percent to +25

percent), is $34.6 million, with a projected in-service date of April 2019 (EFSB-RR-18; Exh. EFSB-G-52(1)).

Figure 1. The Walpole to Holbrook Reliability Project with Primary and Noticed Alternative Routes



See Exh. EV-4, at Fig. 2.3.

B. Procedural History

On April 28, 2014, Eversource filed three petitions with the Siting Board and the Massachusetts Department of Public Utilities ("Department") relating to the Project. In these petitions, the Company seeks: (1) approval of a petition to construct the Project, pursuant to G.L. c. 164, § 69J ("Siting Petition"); (2) approval of a petition to construct, operate and maintain the Project pursuant to G.L. c. 164, § 72 ("Section 72 Petition"); and (3) individual and

comprehensive zoning exemptions from the zoning bylaws of Sharon, Walpole, and Holbrook pursuant to G.L. c. 40A, § 3 ("Zoning Petition," together, "Petitions").

The Siting Petition was docketed as EFSB 14-2, the Section 72 Petition as D.P.U. 14-73, and the Zoning Petition as D.P.U. 14-74. On May 30, 2014, the Chairman of the Department issued a Consolidation Order, referring the Section 72 and Zoning Petitions for review and approval or rejection to the Siting Board pursuant to G.L. c. 164, § 69H. The consolidated proceeding was docketed as EFSB 14-2/D.P.U. 14-73/14-74. The Siting Board conducted a single adjudicatory proceeding and developed a single evidentiary record for the consolidated Petitions.

Pursuant to the Presiding Officer's instructions, the Company published the Notice of Public Hearing/Notice of Adjudication ("Public Hearing Notice") for the Project once per week for three consecutive weeks in the Boston Globe and the Patriot Ledger. The Presiding Officer also directed the Company to place copies of the Public Hearing Notice and a copy of the Petition in the Clerk's office and the public library in Walpole, Sharon, Canton, Stoughton, Avon, Randolph and Holbrook. In addition, the Presiding Officer directed the Company to send by first class mail the Public Hearing Notice and summary page (in English, Spanish, and Portuguese) to the property owners abutting the proposed ROW for the Primary Route and the Noticed Alternative Route, and to abutters-to-abutters within 300 feet of the ROW.

The Siting Board conducted public hearings in Walpole and Stoughton on July 21, and July 22, 2014, respectively. Commenters raised a variety of issues including concerns about health impacts associated with electric and magnetic fields, the visual appearance of the proposed Sharon Switching Station, the Company's ongoing relationship with the Town of Stoughton, and complaints about the Company's failure to adequately landscape the existing Stoughton Switching Station, as required by the Siting Board in Boston Edison Company d/b/a NSTAR Electric, 14 DOMSB 233; EFSB 04-1/D.T.E. 04-5/04-7 (2005) ("Stoughton/Boston"). On January 23, 2015, the Presiding Officer granted intervenor status to Elaine M. Hyland, Lawrence E. Sandberg, and the Town of Holbrook ("Holbrook") and limited participant status to the Town of Sharon.

It was discovered that the Company did not serve a copy of the Notice of Adjudication and Public Comment Hearing on more than 1,000 condominium owners in the Project

communities, which resulted in the June 19, 2015 suspension of the existing procedural schedule to allow time for the Company to correct its earlier service oversight. A new public comment hearing was held on December 16, 2015 in Stoughton to allow for additional public comment, and the Siting Board extended the date for petitions to intervene in the case until January 16, 2016.

MacIntosh Farm Condominium Association ("MFCA") was granted full party status on June 19, 2015. Thereafter, the Town of Sharon requested full party intervenor status, which was granted on July 20, 2015. Michael J. Lang and Nancy Munroe were granted full party intervenor status on February 29, 2016.

The Petitioner presented the testimony of the following witnesses in support of the Petitions: Denise Bartone, Senior Environmental Engineer; Elizabeth J. Leonard, Senior Engineer; Jack Lopes, Community Relations Specialist; Kevin McCune, Licensing and Permitting Supervisor; Kate McEneaney, Siting Analyst; John McLaughlin, Senior Planning Engineer; Michael O'Malley, Project Manager; Dr. Peter Valberg, Principal at Gradient; Douglas Vigneau, Senior Project Manager , Vanasse Hangen Brustlin; and John Zicko, Director of Substation and Overhead Transmission Line Engineering. The Company also filed direct testimony for two additional witnesses: Christopher Plecs and James Bodkin. These witnesses were not presented for cross-examination.

The Siting Board conducted five days of evidentiary hearings in June 2016. After the end of evidentiary hearings, the Company needed to significantly amend and correct its previously submitted evidence concerning the environmental impacts of its project approach alternatives (see Exh. EFSB-PA-5; Exh. EFSB-PA-5(R1); Exh. EFSB-PA-5(R2)). The Company filed an initial brief on September 30, 2016. Ms. Hyland filed a brief on September 16, 2016, and Ms. Munroe filed a reply brief on October 13, 2016. The Company filed its reply brief on October 28, 2016.

On June 29, 2016, the Company entered into a settlement agreement ("Settlement Agreement") with MacIntosh Farm (Exh. EV-7). On July 6, 2016, the Company entered into a Host Community Agreement ("HCA") with the Town of Sharon (Exh. EV-8). The Company's architectural screening plan and landscaping plan for the proposed Sharon Switching Station were the subjects of the Settlement Agreement and the Host Community Agreement

(Exhs. EV-7; EV-8; EFSB-RR-30; EFSB-RR-30(1); EFSB-RR-30(2); Tr. 3, at 327-328). On June 30, 2016 and July 14, 2016, MFCA and the Town of Sharon, respectively, filed notices of withdrawal from the proceeding.

The Company requests that the terms of the Settlement Agreement be attached to or incorporated into any decision of the Siting Board approving the Project as additional conditions to approval (Company Brief at 16, n.10, citing Exh. EV-7). The Settlement Agreement and the Host Community Agreement are part of the record in this proceeding, and in its analysis of the Proposed Facility in this case, the Siting Board relies on certain commitments made by the Company concerning project design, landscaping, and the exterior treatment of the Sharon Switching Station (Exhs. EV-7; EV-8). However, the Settlement Agreement and the Host Community Agreement are agreements negotiated outside of this proceeding. Therefore, the Siting Board declines to incorporate the entire Settlement Agreement and Host Community Agreement into the Final Decision. Where any future deviations from the Settlement Agreement or Host Community Agreement's provisions constitute changes other than minor variations to the Project, the Company is obligated to notify the Siting Board in writing so that it may consider whether further inquiry is required.

The case was delayed several times because of a variety of issues, including: completion of ISO-New England's ("ISO-NE") updated Needs Assessment and Solutions Study; updates to the Company's filing to reflect changes to certain Critical Energy Infrastructure Information ("CEII") designations; initial notice deficiencies requiring re-noticing the proceeding; an additional public comment hearing and intervention period arising from the deficiencies in the Company's original notice procedures; and significant corrections to information provided by the Company. The Company's April 28, 2014 filing relied on a July 8, 2010 Greater Boston Area Transmission Needs Assessment, which, in turn, relied on the 2008 Capacity, Energy, Loads, and Transmission ("CELT") Report and the results of Forward Capacity Auction ("FCA") 2. ISO-New England anticipated that it would issue an updated Needs Assessment in August 2014, which the Siting Board required before issuing information requests in the case. However, ISO-New England's Greater Boston Updated Transmission Needs Assessment was not released until January 2015.

Siting Board staff prepared a Tentative Decision and distributed it to Siting Board members and all parties and limited participants for review and comment on September 8, 2017. The parties were given until September 15, 2017, to file written comments on the Tentative Decision. Written comments were received from the Company, the Town of Sharon, MacIntosh Farm Community Association, and Lawrence E. Sandberg. The Siting Board met to consider the Tentative Decision on September 20, 2017, at which the parties and limited participants were invited to present oral comments to the Siting Board. Comments were presented by the Company and MacIntosh Farm Community Association. After deliberation, the Board directed staff to draft a Final Decision approving the Petitions, subject to the conditions set forth below.

II. JURISDICTION AND STANDARD OF REVIEW

G.L. c. 164, § 69J provides that the Siting Board shall approve a petition to construct if the Siting Board determines that the petition meets certain requirements, including that the plans for the construction of the applicant's facilities are consistent with the policies stated in G.L. c. 164, § 69H to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. Pursuant to G.L. c. 164, § 69J, a project applicant must obtain Siting Board approval for the construction of proposed energy facilities before a construction permit may be issued by another state agency.

G.L. c. 164, § 69G defines a "facility" to include "a new electric transmission line having a design rating of 115 kilovolts or more which is ten miles or more in length on an existing transmission corridor, except [for] reconductoring or rebuilding of transmission lines at the same voltage" or "a new electric transmission line having a design rating of 69 kilovolts or more and which is one mile or more in length on a new transmission corridor." The proposed 115 kV transmission line is clearly a "facility" with respect to Section 69J, and therefore, the Project is subject to Siting Board review under Section 69J.

The Siting Board requires that an applicant demonstrate that its proposal meets the following requirements: (1) that additional energy resources are needed (see Section III, below); (2) that, on balance, the proposed project is superior to alternative approaches in terms of reliability, cost, and environmental impact, and in its ability to address the identified need (see Section IV, below); (3) that the applicant has considered a reasonable range of practical facility siting alternatives and that the proposed facilities are sited in locations that minimize

costs and environmental impacts (see Section V, below); (4) that environmental impacts of the project are minimized and the project achieves an appropriate balance among conflicting environmental concerns as well as among environmental impacts, cost, and reliability (see Section VI, below); and (5) that plans for construction of the proposed facilities are consistent with the current health, environmental protection and resource use and development policies of the Commonwealth (see Section VIII, below).

III. NEED ANALYSIS OF THE PROPOSED PROJECT

A. Standard of Review

The Siting Board reviews the need for proposed transmission facilities to meet reliability, economic efficiency, or environmental objectives. G.L. c. 164, §§ 69H, 69J. When demonstrating the need for a proposed transmission facility based on reliability considerations, a petitioner applies its established planning criteria for construction, operation, and maintenance of its transmission and distribution system. Compliance with the applicable planning criteria can demonstrate a "reliable" system. NSTAR Electric Company d/b/a Eversource Energy, EFSB 15-03/D.P.U. 15-64/15-65, at 6 (2017) ("Mystic-Woburn"); New England Power Company d/b/a National Grid, 20 DOMSB 129; EFSB 13-2/D.P.U. 13-151/13-152, at 6 (2014) ("Salem Cables"); New England Power Company d/b/a National Grid and Western Massachusetts Electric Company, 18 DOMSB 323; EFSB 10-1/D.P.U. 10-107/10-108, at 5 (2012) ("Hampden County").

Accordingly, to determine whether system improvements are needed, the Siting Board: (1) examines the reasonableness of the petitioner's system reliability planning criteria; (2) determines whether the petitioner uses reviewable and appropriate methods for assessing system reliability over time based on system modeling analyses or other valid reliability indicators; and (3) determines whether the relevant transmission and distribution system meets these reliability criteria over time under normal conditions and under certain contingencies, given existing and projected loads. Mystic-Woburn, at 7; Salem Cables at 6-7; Hampden County at 5.

When a petitioner's assessment of system reliability and facility requirements is, in whole or in part, driven by load projections, the Siting Board reviews the underlying load forecast. The

Siting Board requires that forecasts be based on substantially accurate historical information and reasonable statistical projection methods that include an adequate consideration of conservation and load management. See G.L. c. 164, § 69J. To ensure that this standard has been met, the Siting Board requires that forecasts be reviewable, appropriate, and reliable. A forecast is reviewable if it contains enough information to allow a full understanding of the forecast method. A forecast is appropriate if the method used to produce the forecast is technically suitable to the size and nature of the company to which it applies. A forecast is considered reliable if its data, assumptions, and judgments provide a measure of confidence in what is most likely to occur. Mystic-Woburn at 7; Salem Cables at 7; Hampden County at 6.

B. Description of the Existing 115 kV Transmission Infrastructure

Eversource's 115 kV transmission system between the West Walpole and Holbrook substations consists of two circuits, Line 447-508 and Line 447-509, sharing a line of DCTs (Exh. EV-2, at 2-2R2).[2] The Company stated that Lines 447-508 and 447-509 deliver power to six load-serving substations, which serve 13 towns and approximately 58,000 electric customers with a peak demand of 306 megawatts ("MW") at 2013 peak load levels (id.).

C. Description of the Company's Demonstration of Need

The Company's transmission planning activities are governed by the Regional System Planning Process administered by ISO-New England ("ISO-NE") (Exh. EFSB-N-57). In its role as the region's Independent System Operator, ISO-NE completes periodic needs assessments to identify regional transmission needs based on reliability standards, presents transmission solutions to meet the needs, and prepares solution studies to identify the most cost-effective

[2] Between the West Walpole and Walpole substations, there is an additional 115 kV circuit, Line 146-502 (Exh. EV-2, at 2-2R2). The Company described Line 146-502 as a radial element, delivering power from a substation to a load, unlike Lines 447-508 and 447-509, which transmit power from one part of the transmission system to another (Exh. EV-2; Tr. 1, at 78-79). The Company stated that as a radial element, Line 146-502 is not subject to North American Electric Reliability Corporation ("NERC") or ISO-NE planning criteria for transmission elements, but the Company plans all its transmission elements to meet the NERC and ISO-NE planning criteria (Tr. 1, at 78-81).

solution (Exhs. EV-2, at 2-14R2 to 2-15R2; EFSB-N-57). The Company's assertion of need for the Project is based on ISO-NE's "Greater Boston Area Updated Transmission Needs Assessment" ("2015 Needs Assessment"), as described below (Exh. EFSB-N-43(1)). The 2015 Needs Assessment assessed the ability of the Greater Boston Area transmission system to withstand contingency conditions given projections of peak load, generator availability, and regional power flows (Exh. EV-2, at 2-15R2).

1. Greater Boston Area Transmission Needs Assessment

Eversource's 115 kV transmission system in the Walpole to Holbrook area is within a broader transmission area referred to as the "Greater Boston Area" (Exhs. EV-2, at 2-1R2; EFSB-N-43(2) at 9). The Greater Boston Area generally includes communities north and east of Interstate 495 up to the New Hampshire border, the City of Boston, and suburbs south of Boston including Medway, Walpole, and Holbrook (Exh. EFSB-N-43(2) at 10, 57). Since 2008, a group of representatives from ISO-NE and local electric utilities, including Eversource, have served on the Greater Boston Working Group ("Working Group") to identify reliability-based transmission needs in the Greater Boston study area (Exh. EFSB-N-43(2) at 9).

The Company stated that the Working Group published its initial needs assessment, the "Greater Boston Area Transmission Needs Assessment," on July 8, 2010 ("2010 Needs Assessment") (Exh. EFSB-N-43(2)). As discussed above, Eversource included this document in its initial petition to the Siting Board. In the 2015 Needs Assessment, the Working Group performed a reassessment of the Greater Boston Area transmission needs, reflecting changes in the transmission system, forecasted load levels, and planned generation additions and retirements since 2010 (Exhs. EFSB-N-43(2) at 12; EFSB-N-76). Eversource stated that many of the system problems originally identified in the 2010 Needs Assessment were still present and re-confirmed in the 2015 Needs Assessment (Exh. EFSB-N-76).

According to the Company, the 2015 Needs Assessment evaluated the reliability of the transmission system serving the Greater Boston Area under 2018 and 2023 projected system conditions (Exh. EFSB-N-43(2) at 9). Eversource stated that the 2015 Needs Assessment showed deficiencies in the Greater Boston Area transmission system when modeled in accordance with NERC, Northeast Power Coordinating Corporation ("NPCC"), New England

Power Pool ("NEPOOL"), and ISO-NE transmission planning reliability standards (Exhs. EV-2, at 1-2R2, 2-R2; EFSB-N-27; EFSB-N-43(2) at 9). The criteria established by NERC, NPCC, NEPOOL, and ISO-NE ensure that the electric power system serving New England and the Eversource service territory are designed to provide an adequate and reliable electric power delivery system (Exh. EV-2, at 2-8R2). Specifically, the standards and criteria established by these entities require transmission operators to design, test, and operate their systems to perform without experiencing thermal overloads or voltage violations under various contingencies (id. at 2-9R2).

A single contingency, known as an "N-1" contingency, is defined as a single event causing the loss of one or more system elements (including two transmission circuits on a DCT) (id. at 2-2R2, 2-9R2). The occurrence of two separate and unrelated outages occurring within a short period of time (i.e., 30 minutes) is known as an "N-1-1" contingency (Exh. EV-2, at 2-2R2, 2-9R2; RR-EFSB-6). For the transmission system to meet the established reliability criteria, the system must be designed such that there are not any instances of a transmission element violating its thermal capability, or unacceptably high voltage levels, following an N-1 or N-1-1 contingency (Exh. EV-2, at 2-10R2). [3]

In addition to the evaluation of thermal overloads and voltage violations described above, the 2015 Needs Assessment studied whether any N-1 or N-1-1 contingencies could result in consequential load loss approaching or exceeding 300 MW (Exhs. EV-2, at 2-17R2; EFSB-N-43(2) at 16; Tr. 1 at 63-64).[4] Transmission planning standards such as the NERC

---

[3] The thermal rating of an element is a function of the element's heat-dissipation capability and is based on the maximum temperature at which the element can operate (Exhs. EV-2, at 2-10R2; EFSB-N-12). The normal rating is the continuous operating limit for the element (Exh. EV-2, at 2-10R2). The long-term emergency ("LTE") rating is the twelve-hour capability of an element, and the short-term emergency ("STE") rating is the 15-minute capability of an element (Exh. EV-2, at 2-10R2). Standards require that an element can operate above the normal rating but below the LTE rating for no more than twelve hours, and can operate above the LTE rating but below the STE rating for no more than 15 minutes (id.).

[4] Consequential load loss is the interruption of load that is directly connected to a transmission element that has experienced an outage (Exhs. EV-2, at 2-17R2; EFSB-N-43(2) at 57; Tr. 1, at 59).

Reliability Standard for Transmission System Planning do not specify a maximum allowable amount of load that can be lost as a direct consequence of a system contingency (Exhs. EV-2, at 2-17R2; EFSB-N-3(1); RR-EFSB-18). However in 2010, ISO-NE developed a draft guideline ("ISO-NE Load Interruption Guideline") identifying the amount of load interruption that may be acceptable following N-1 and N-1-1 contingencies (Exhs. NSTAR-1, A2, at 2-17R2; EFSB-N-3(1); RR-EFSB-8).

a. Load Forecast Methodology

Eversource stated that the 2015 Needs Assessment relied on the summer peak 90/10 load forecast from the 2013 CELT Report to develop 2018 peak load levels for the five-year horizon and 2023 peak load levels for the ten-year horizon (Exhs. EV-2, at 2-15R2; EFSB-N-43(2) at 11).[5,6] The Company stated that passive and active demand response ("DR") resources that had cleared the 2013 FCA 7 and energy efficiency ("EE") as forecasted in the 2013 CELT Report were modeled as load reductions to establish net demand for the Greater Boston Area (Exhs. EFSB-N-36(S1); EFSB-N-33(S1); EFSB-N-43(2) at 12, 27).[7,8,9]

---

5 The 90/10 forecast is based on extremes of weather that are expected to occur once every ten years on average (Exh. EFSB-N-58; RR-EFSB-1).

6 While Eversource made clear that its case for Project need was based on area reliability issues identified in ISO-NE's 2015 Needs Assessment, the Company also provided its substation level load forecast to the Siting Board (Exh. EFSB-N-51; EFSB-N-61). The Company stated that its load forecast supports the case that the Project is needed (Tr. 1, at 21-22).

7 The Company responded to requests from staff regarding system load changes (e.g., forecasted load levels, forecasted EE, additions of DR, and additions of generation resources) that have occurred since FCA 7 and the 2013 CELT Report (Exhs. EFSB-N-77, EFSB-N-78, EFSB-N-79). Eversource asserted that the differences in forecast system load are not significant and do not impact the need for the Project, especially since the Company has identified the year of need as pre-2013 (id.).

8 Eversource stated that projected growth in solar photovoltaics ("solar PV") was not considered in the forecast used in the 2015 Needs Assessment (Exh. EFSB-N-80). The "Final 2015 PV Forecast" was issued on April 14, 2015, after the 2015 Needs Assessment was issued (Exh. EFSB-N-81(1)). The Company concluded that the amount of available solar PV resources in the Boston area is forecasted to be less than one percent of Boston area load in 2018 and 2023; and therefore the inclusion of solar PV

Eversource stated that the CELT report is a ten-year econometric forecast that projects peak energy loads and resources for the New England region, and is the source of many assumptions used in the region's electric power planning and reliability studies (Exh. EFSB-N-58). The Company stated that the annual CELT report results from a rigorous stakeholder process that aims to produce a consistent load forecast and is appropriate as the basis for peak load projections in the 2015 Needs Assessment (id.). ISO-NE's CELT report produces an econometric forecast based on economic indicators such as predictions of gross domestic product, per capita personal income, and energy prices (Exhs. EFSB-N-58; EFSB-N-58(1) at 3). The Company asserted that the 1.4 percent growth rate used in the 2013 CELT report is appropriate based on historical growth rates (Exh. EFSB-N-83; RR-EFSB-3).

b. Peak Load Base Cases Assessed

Eversource stated that the 2015 Needs Assessment examined 37 peak load base cases: 34 "Design Cases" and three "Retirement Sensitivity Cases" for each of the two study years, which represented a range of possible generation dispatch and availability scenarios under summer peak conditions (Exhs. EV-2, at 2-16R2; EFSB-N-43(2) at 12-13). In the 2015 Needs Assessment, ISO-NE stated that a criteria violation in any single design case constitutes a need that must be addressed by a proposed solution, but that the results of all 37 base cases were used to determine the robustness of proposed solutions (Exh. EFSB-N-43(2) at 13, 35).

---

does not significantly affect the 2015 Needs Assessment or the need for the Project (Exh. EFSB-N-80).

9 The Company defined passive DR resources, such as EE, distributed generation, and load management, as resources that save energy (i.e., MWh) during peak hours and are not dispatchable (Exh. EFSB-N-35). Eversource defined active DR as resources that reduce peak loads (i.e., MW) based on real-time system conditions or ISO-NE dispatches; such as real-time demand response and emergency generation (id.). The Company noted that passive and active DR resources can be bid into the FCA; however, since the FCA occurs yearly and is for a period three years in the future, DR resources beyond a three year period are forecasted in ISO-NE's EE forecast (Exh. EFSB-N-36(S1)). ISO-NE models active DR in the same way it models generators, since active DR are dispatchable resources; ISO-NE is currently forecasting active DR at a constant level in the years beyond the subject year of the latest FCA (id.).

The 37 generation dispatch cases were organized by regional interface transfer levels: (1) high north-south flows (power flowing from northern New England into southern New England) along with high southeastern Massachusetts/Rhode Island ("SEMA/RI") flows (power flowing out of SEMA/RI); (2) high north-south flows with low flows out of SEMA/RI; and (3) low north-south flows with high flows out of SEMA/RI (Exh. EFSB-N-43(2) at 29; Tr. 1, at 42-46). The "Design Cases" included expected generation unavailability by modeling one or two area generators (e.g., Fore River; Kendall; Mystic 7, 8, and 9; Footprint) out of service; the "Retirement Sensitivity Cases" assumed the retirement of Mystic 7, in addition to two area generators out of service (Exh. EFSB-N-43(2) at 12-13, 35-36).

c. Walpole-Holbrook Reliability Needs

Eversource stated that the 2015 Needs Assessment identified capacity and reliability issues within the current 115 kV transmission system between the West Walpole and Holbrook Substations based on the reliability and planning standards and criteria described above (Exh. EV-2, at 2-18R2). Specifically, the 2015 Needs Assessment identified: (1) post N-1 contingency thermal overloads on Line 447-508 in 2018 and 2023; (2) post N-1-1 contingency thermal overloads on Lines 447-508, 447-509, and 146-502 in 2018 and 2023; and (3) post N-1 and N-1-1 contingency consequential load loss in 2018 and 2023 (Exhs. EV-2, at 2-17R2; EFSB-N-71; EFSB-N-75).[10]

The Company stated that the 2015 Needs Assessment identified an N-1 overload of 108 percent of Line 447-508's LTE rating in 2018, increasing to 111 percent in 2023 (Exhs. EV-2, at 2-16R2; EFSB-N-43(2) at 78). Eversource reported that because the N-1 contingency overload occurred for 22 of the total 34 "Design Cases" in 2018, and 28 of the total 34 "Design Cases" in 2023, the overload can be considered an event that is generally independent of dispatch or regional power flows (Exh. EFSB-N-70; RR-EFSB-12).

---

[10] The Company stated that the 2015 Needs Assessment identified high voltage violations in the Walpole-Holbrook area, but that those violations would not be resolved by the Project (Exh. EFSB-N-66). The high voltage violations were solved by the installation of a series breaker at the Stoughton Switching Station in May 2016 (Exh. EFSB-N-66; Tr. 1, at 85).

Table 1, below, provides the total number of N-1-1 contingencies that the 2015 Needs Assessment identified would lead thermal overloads in each test year, and the number of "Design Cases" in which an overload would occur.

Table 1. N-1-1 Contingencies and Related Design Base Cases

	2018		2023	
	Number of N-1-1 Contingencies	Number of Design Cases with Overloads	Number of N-1-1 Contingencies	Number of Design Cases with Overloads
Line 447-508	169	34	171	34
Line 447-509	13	16	14	26

Sources: Exh. EFSB-N-68; RR-EFSB-10; RR-EFSB-9; RR-EFSB-50.

According to the Company, the worst-case N-1-1 overload on Lines 447-508 and 447-509 would exceed 118 percent of an LTE line rating in 2018 and 125 percent of an LTE line rating in 2023 (Exhs. EV-2, at 2-17R2; EFSB-N-43(2) at 106; EFSB-N-70). Furthermore, the Company stated that the most pervasive contingency (i.e., contingency that resulted in LTE overloads under the largest number of design base cases) would lead to post N-1-1 contingency overloads on Line 447-508 in all 34 base cases in 2018 and 2023, and therefore is an event that is independent of dispatch or regional power flows (Exh. EFSB-N-70; Tr. 1, at 96).

In addition to thermal overloads, the 2015 Needs Assessment identified the potential for the loss of over 300 MW in load due to an N-1 or N-1-1 contingency in the Project corridor (Exhs. EV-2, at 2-17R2; EFSB-N-75). The N-1 contingency would result in the loss of all load in the Project corridor, except for load served by one transformer at the Walpole Substation, and the N-1-1 contingency would result in the loss of all load (Exh. EFSB-N-75). In 2018, an N-1-1 contingency would lead to the loss of up to 313 MW of load; and in 2023 the potential load loss would increase to 324 MW (Exhs. EV-2, at 2-17R2; EFSB-N-43(2) at 65).[11] The projected loss of load found in the 2015 Needs Assessment for the Project area exceeds the proposed 300 MW

[11] The amount of potential load loss was determined based on the peak load forecasts and N-1 and N-1-1 contingencies that could occur to the Project area, and was not derived directly from the ISO-NE base cases (Tr. 1, at 101-102).

limit in the ISO-NE Load Interruption Guideline (Exhs. NSTAR-1, A2, at 2-17R2; EFSB-N-3; EFSB-N-5).

Eversource concluded that, based on the existing configuration of the transmission system and expected future electric load, transmission element overloads and significant consequential load loss could occur in the Walpole-Holbrook area under the reliability planning criteria noted above (Exh. EV-2, at 2-9R, 2-17R2). The 2015 Needs Assessment identified the year of need for thermal overloads and consequential load loss issues in the Walpole-Holbrook area to be "pre-2013" (Exhs. EV-2, at 2-2R; EFSB-N-24). Accordingly, the Company stated that there is an immediate need to mitigate the potential consequences of N-1 and N-1-1 contingencies on Lines 447-508 and 447-509 between the West Walpole and Holbrook Substations and that this need is not dependent on future load growth in the Greater Boston Area (Exh. EV-2, at 2-18R; EFSB-N-60).

2. Greater Boston Area Solutions Study

ISO-NE published a solutions study in March 2012 ("2012 Solutions Study") to address the needs identified in the 2010 Needs Assessment (Exh. EFSB-N-43(2) at 10). Following the issuance of the 2012 Solutions Study, ISO-NE further studied two solution packages: the "AC Option" and "HVDC Option" (Exh. EFSB-N-43(2) at 10). The 2012 Solutions Study identified specific projects that were deemed "common upgrades," projects that would be needed regardless whether ISO-NE selected the AC Option or HVDC Option for the Greater Boston Area and a separate solutions study was conducted for these projects (Exhs. EFSB-N-22(1) at 4; EFSB-N-22(2) at 3; EFSB-N-64(1) at 12; Tr. 1, at 102-104). Eversource presented the Project to ISO-NE's Planning Advisory Committee on December 18, 2013 and February 19, 2014 (Exhs. EFSB-N-22(1); EFSB-N-22(2)). Therefore, the development of the Project, including the filing of the Project with the Siting Board, was advanced prior to the publication of "Greater Boston Area Transmission Solutions Study" on August 12, 2015 ("2015 Solutions Study") (Exhs. EFSB-N-22(1) at 4; EFSB-N-22(2) at 3; EFSB-N-64(1)). The Project is discussed in the 2015 Solutions Study as a "common upgrade" that would be needed independent of the ultimate solution package selected (Exh. EFSB-N-64(1) at 71; Tr. 1, at 102-103).

D. Analysis and Findings on Need

In the 2015 Needs Assessment, ISO-NE's Working Group identified numerous reliability needs within the Greater Boston Area, including deficiencies in the Walpole-Holbrook area. The 2015 Needs Assessment demonstrates that the existing transmission system would be insufficient to reliably supply customers in the Greater Boston Area under pre-existing and forecasted summer peak load conditions following criteria violations. The record shows that the Company's transmission planning activities are governed by ISO-NE and that the Company used ISO-NE's needs analyses for its own transmission planning process. The 2015 Needs Assessment identified elements of the Greater Boston transmission system in the Walpole-Holbrook area that failed to meet reliability criteria established by NERC, NPCC, NEPOOL, and ISO-NE, thus establishing need for additional transmission resources.

The 2015 Needs Assessment evaluated 37 peak load cases for the study years of 2018 and 2023, representing a comprehensive variety of operating conditions in the area. For each of the base cases, ISO-NE simulated numerous contingencies to test the transmission system's capacity to meet normal and emergency operating conditions. Eversource described an N-1 and N-1-1 contingency that would lead to thermal overloads in a majority of the peak load base cases, and are independent of generation dispatch and regional power flows; therefore, these overloads could occur under numerous operating scenarios. Further, the record shows a potential for consequential load loss exceeding ISO-NE's Load Interruption Guideline. The Siting Board finds that Company's reliability planning criteria, based on ISO-NE's transmission planning process, are reasonable and that the Company used reviewable and appropriate methods for assessing system reliability.

The 2015 Needs Assessment used the load forecast from the 2013 CELT report, with adjustments for EE and DR forecasts and FCA results, to predict peak loads in 2018 and 2023. The 2013 CELT report contains a 90/10 peak load forecast that relies on econometric modeling to produce an energy forecast. The Siting Board has relied on similar econometric modeling in past transmission project cases. The Company has provided enough information to allow Siting Board staff to gain a general understanding of its load forecasting methodology. Accordingly, the Siting Board finds Eversource's load forecast is reviewable, appropriate, and reliable.

Based on this reliability assessment, the Company's existing transmission system in the Project area does not meet planning agency or Company planning criteria for thermal overloads, or ISO-NE guidelines for consequential load loss. For these reasons, the Siting Board finds that additional energy resources are needed to maintain a reliable supply of electricity in the Walpole-Holbrook Area.

IV. ALTERNATIVE APPROACHES TO MEETING THE IDENTIFIED NEED

A. Standard of Review

G.L. c. 164, § 69J requires a project proponent to present alternatives to the proposed facility, which may include: (1) other methods of transmitting or storing energy; (2) other sources of electrical power; or (3) a reduction of requirements through load management.[12] In implementing its statutory mandate, the Siting Board requires a petitioner to show that, on balance, its proposed project is superior to such alternative approaches in terms of cost, environmental impact, and ability to meet the identified need. In addition, the Siting Board requires a petitioner to consider reliability of supply as part of its showing that the proposed project is superior to alternative project approaches. Mystic-Woburn at 18; Salem Cables at 17-18; NSTAR Electric Company, 19 DOMSB 1, EFSB 10-2/D.P.U. 10-131/10-132, at 29 (2012) ("Lower SEMA").

B. Identification of Transmission Alternative Approaches for Analysis

The Company stated that it evaluated a series of project alternatives to determine the approach that best balances environmental impacts, reliability, and cost (Exh. EV-2, at 1-3R2). According to the Company, these consisted of a variety of alternative means of accomplishing the Project objectives, including a number of alternative transmission solutions, a no-build alternative, and non-transmission alternatives ("NTAs") such as new generation, either alone or supplemented by EE, demand-response programs, or distributed generation (id.).[13]

---

[12] G.L. c. 164, § 69J also requires an applicant to present "other site locations." This requirement is discussed in Section V.A, below.

[13] A no-build alternative would not meet the resource need identified in Section III, and therefore is not considered here.

The Company studied seven alternative transmission project approaches to satisfy the identified need (Exh. EV-2, at 3-3R2 to 3-14R2). Table 2, below, summarizes the cost, reliability, and environmental impact elements of the Company's seven transmission alternatives.

A physical description of the seven transmission alternatives is provided below.[14] Transmission Alternative 1 is the Company's proposed Project in this case. It should be noted that none of the transmission alternatives completely eliminates the potential for interrupted load under a variety of N-1-1 contingency events. Instead, each transmission alternative provides a reduction of the potential MW levels of interrupted loads that could occur under N-1-1 contingencies. Currently, customers face the potential interruption of up to 324 MW in the area (Exh. EV-2, at 2-17R2). With the Project, customers would face the potential interruption of no more than 189 MW of area load (Exh. EFSB-PA-78).

1. Transmission Alternative 1 (the Proposed Project)

The Project would add a new overhead 115 kV line between the Walpole Substation and the Holbrook Substation on existing transmission structures that currently support a 345 kV line in an existing ROW (Exh. EV-3, App. 3-1). The Project would also include a new three-breaker switching station in Sharon on Company-owned property (id.). There would be no change to the existing 115 kV double circuit tower configuration in the existing ROW between Walpole Substation and Holbrook Substation (id.).

2. Transmission Alternative 2

Similar to Transmission Alternative 1, Transmission Alternative 2 would also add a new overhead 115 kV transmission line between the Walpole Substation and the Holbrook Substation on existing transmission structures that currently support a 345 kV line in an existing ROW (Exh. EV-3, App. 3-1). In addition, the Company would separate the existing 14 miles of 115 kV double-circuit lines between the Walpole Substation and the Holbrook Substation by installing one of the circuits on a new set of approximately 99 transmission structures in between

[14] Each transmission alternative includes the following additional common elements: (1) separation of the DCT configuration between the West Walpole and Walpole substations; and (2) modifications to the Holbrook and Stoughton Substations.

the two existing rows of structures in the ROW (Exhs. EV-2, at 3-4R2 to 3-6R2; EFSB-PA-5). Alternative 2 does not include a switching station in Sharon (Exh. EV-3, App. 3-1).

3. Transmission Alternative 3

Similar to Transmission Alternative 1, Transmission Alternative 3 would also add a new overhead 115 kV transmission line between the Walpole Substation and the Holbrook Substation on existing transmission structures that currently support a 345 kV line in an existing ROW (Exh. EV-2, at 3-6R2). The Company would also include the construction of a single-breaker 115 kV switching station in Sharon on Company-owned property (id.). Under Alternative 3, the Company would not change the existing 115 kV double circuit tower configuration in the existing ROW (Exh. EV-3, at App. 3-1).

4. Transmission Alternative 4

Similar to Transmission Alternative 1, Transmission Alternative 4 would also add a new overhead 115 kV transmission line between the Walpole Substation and the Holbrook Substation on existing transmission structures that currently support a 345 kV line in an existing ROW (Exh. EV-2, at 3-7R2). The Company would also include a 3.3–mile "loop" of the new 115 kV line extending from the ROW into the Norwood Municipal Light Department's Dean Street Substation in Norwood, where the Company would install a new 115 kV circuit-breaker (id.; Exh. EV-3, at App. 3-1). Transmission Alternative 4 would "split" the new 115 kV circuit, with the first element of the circuit located between the West Walpole and Dean Street Substations, and the second element of the circuit located between the Dean Street and Holbrook Substations (Exh. EV-3, at App. 3-1). Transmission Alternative 4 would require 34 additional transmission structures in the Dean Street Station ROW (Exh. EFSB-PA-5). The Company would not construct a new switching station in Sharon, and not change the existing 115 kV double circuit tower configuration in the existing ROW (Exh. EV-3, at App. 3-1).

5. Transmission Alternative 5

Similar to Transmission Alternative 1, Transmission Alternative 5 would also add a new overhead 115 kV transmission line between the Walpole Substation and the Holbrook Substation

on existing transmission structures that currently support a 345 kV line in an existing ROW (Exh. EV-2, at 3-8R2). The Company would also use the existing Canton Substation to add one 115 kV in-line breaker to the new 115 kV circuit (id.). The Company would construct a new 1.5-mile 115 kV line segment from the existing ROW to the Canton Substation along the existing railroad ROW; this construction may require the acquisition of new ROW width and/or property rights (Exhs. EV-2, at 3-8R2; EV-3, at App. 3-1). Transmission Alternative 5 would require approximately 34 new transmission structures in the ROW in Canton (Exhs. EV-2, at 3-8R2; EFSB-PA-5).

Transmission Alternative 5 would "split" the new 115 kV circuit, with the first element of the circuit between the West Walpole and Canton Substations in Canton, and the second element of the circuit between the Canton Substation and the Holbrook Substation (Exh. EV-2, at 3-8R2). The Company would not construct a new switching station in Sharon, and not change the existing 115 kV double circuit tower configuration in the existing ROW (Exh. EV-3, at App. 3-1).

6. Transmission Alternative 6

Similar to Transmission Alternative 1, Transmission Alternative 6 would also add a new overhead 115 kV transmission line between the Walpole Substation and the Holbrook Substation on existing transmission structures that currently support a 345 kV line in an existing ROW (Exh. EV-2, at 9R2). The Company would also split the new 115 kV circuit by creating a mainline "loop" through the existing Dean Street and Ellis Avenue Substations in Norwood (id.). The first element of the new circuit would travel between the West Walpole Substation and the Dean Street Substation and the second element of the circuit would travel between the Dean Street Substation and the Holbrook Substation (Exh. EV-3, at App. 3-1). The Company would not construct a new switching station in Sharon, and not change the existing 115 kV double circuit tower configuration in the existing ROW (Exhs. EV-2, at 3-9R2; EV-3, at App. 3-1).

7. Transmission Alternative 7

Similar to Transmission Alternative 1, Transmission Alternative 7 would also add a new overhead 115 kV transmission line between the Walpole Substation and the Holbrook Substation

on existing transmission structures that currently support a 345 kV line in an existing ROW (Exhs. EV-2, at 3-10R2; EV-3, at App. 3-1). The Company would also use the existing Canton Substation 115 kV tap lines to "split" the new 115 kV circuit into two segments (id.). The first element of the new circuit would travel between Walpole Substation and the Canton/Amtrak Substation, and the second element of the circuit would travel between the Canton/Amtrak Substation and the Holbrook Substation (Exh. EV-3, at App. 3-1).

Both of the 1.5 mile long tap lines serving the Canton Substation would require an upgrade to higher capacity (Exh. EV-2, at 3-10R2). The Company would not construct a new switching station in Sharon, and not change the existing 115 kV DCT configuration in the existing ROW (Exhs. EV-2, at 3-8R2; EFSB-PA-5).

8. Company's Comparison of the Alternatives

Table 2 below provides a summary of the cost, reliability, and environmental impacts associated with each of the Company's seven Transmission Alternatives.

Table 2. Summary Comparison of Transmission Cost, Reliability, and Environmental Impacts of Transmission Alternatives

Alternative[a]	Reliability[b]	Major Environmental Impacts
Alternative 1 (Proposed Project) One 115 kV line, 3-breaker switch station $34.6 million	Bisects all three 115 kV circuits, thereby reducing extent of N-1-1 impacts Maximum exposure to dropped load is 189 MW	1.3 acres of tree clearing for new Sharon switching station; 5 new structures visual impacts of new switching station 5.52 acres of temporary wetland impact on ROW (swamp matting) 150 sq. ft. of permanently-filled wetlands (300 sq. ft. of wetlands replication)
Alternative 2 Two 115 kV lines, with one new line of poles $37.95 million	Provides double-circuit tower separation, but conductors remain proximate; no new switches Maximum exposure to dropped load is 160 MW	99 new monopoles needed in ROW (existing ROW – no new tree clearing) 2.04 acres of temporary wetland impact on ROW (swamp matting) 540 sq. ft. of permanently-filled wetlands in ROW
Alternative 3 One 115 kV line, single breaker switch station $26.45 million	Adds only one bisecting switch on one 115 kV circuit Maximum exposure to dropped load is 226 MW	1.3 acres of tree clearing for new Sharon switching station; 5 new structures visual impacts of switching station 5.52 acres of temporary wetland impact on ROW (swamp matting) 60 sq. ft. of permanently-filled wetlands
Alternative 4 Two 115 kV lines, add single breaker in an existing substation $36.8 million	Adds only one bisecting switch on one 115 kV circuit Maximum exposure to dropped load is 226 MW	12.5 acres of tree clearing associated with approx. 34 new monopoles along ROW 4C 9.82 acres of temporary wetlands impact on ROW (swamp matting) 390 sq. ft. of permanently-filled wetlands in ROW

Alternative[(a)]	Reliability[(b)]	Major Environmental Impacts
Alternative 5 Two 115 kV lines, add single breaker in an existing substation $32.2 million	Adds only one bisecting switch on one 115 kV circuit Maximum exposure to dropped load is 226 MW	10 new monopoles needed along ROW 4B (no new tree clearing needed) 5.94 acres of temporary wetlands impact on ROW (swamp matting) 180 sq. ft. of permanently-filled wetlands
Alternative 6 One 115 kV line, upgrade an existing substation $41.4 million	One 115 kV circuit would be bisected. Maximum exposure to dropped load is 182 MW	12.5 acres of tree clearing associated with 34 new monopoles along ROW 4C 9.82 acres of temporary wetlands impacts on ROW (swamp matting) 450 sq. ft. of permanently-filled wetlands
Alternative 7 One 115 kV line, upgrade an existing substation $25.3 million	Highest post-construction exposure to dropped load (246 MW)	5.94 acres of temporary wetlands impacts on ROW (swamp matting) 60 sq. ft. of permanently-filled wetlands

(a) The Company originally provided a conceptual cost estimate for Transmission Alternative 2 of $33 million (Exh. EV-2, at 3-6R2). The Company updated its conceptual cost estimate for the Project to a planning grade cost estimate, thereby increasing the expected cost of the Project by 15 percent (RR-EFSB-18). The Company indicated that the remaining transmission alternatives would rise in price by a similar percentage, although no formal planning grade cost estimate was provided (id.). Accordingly, staff has adjusted all transmission-related transmission alternative cost estimates in this table by 15 percent above the amounts in the Petition.
(b) The data provided do not account for the probability of load losses of the magnitudes indicated.
(c) All seven alternatives also include the following: (1) 0.6 acres of tree clearing at Holbrook Substation; (2) eight new monopoles between West Walpole Substation and Walpole Substation for circuit separation; and (3) three new overhead transmission line structures at Stoughton Switching Station.
Source: Exhs. EFSB-PA-5; EFSB-PA-5(R-2); EFSB-W-1; EFSB-W-4; EV-3, Appendix 3-1.

The Company explained that the modeled load loss exposure levels for each of the transmission alternatives are each within the ISO-New England's Transmission System Planning

Load Interruption Guidelines, which allow consequential load interruption for peak loads between 100 MW and 300 MW (Exh. EFSB-N-3(1)).

In comparing the seven transmission alternatives, the Company stated that it focused on the reliability benefits and cost of each alternative because all of the alternatives would have "similar, low environmental impacts" (Company Brief at 59, citing Exh. EFSB-PA-5(R1)). With respect to each alternative's remaining number of N-1-1 contingencies that would lead to dropped load, the Company maintains that although Transmission Alternative 1 (the Project) has the highest number of N-1-1 contingencies compared to the other transmission alternatives, the improvements to line segmentation achieved by Transmission Alternative 1 reduces the line exposure of each of the three circuits, resulting in improved system reliability under contingency conditions, and improved segmentation ability and reliability during system maintenance/repair scenarios (Company Brief at 59, citing RR-EFSB-23; RR-EFSB-24). In addition, the Company states that Transmission Alternative 1 allows for future expansion flexibility at the new switching station site (Company Brief at 59, citing Exh. EV-2, at 3-13R2).

The Company acknowledges that Transmission Alternative 2 could achieve a greater reduction in load loss compared to Transmission Alternative 1 (Company Brief at 60). However, the Company argues that Transmission Alternative 2 would require the installation of new transmission structures along 14 miles of the ROW to separate two existing circuits now located on DCTs, and would also require that the new poles be installed in close proximity to the existing 115 kV line towers (Exh. EFSB-PA-16). According to the Company, the Alternative 2 would result in "minimal phase conductor separation between each line" and would therefore not provide the operational and reliability benefits associated with segmenting the three 115 kV circuits at the proposed Sharon Switching Station (Company Brief at 60, citing Exhs. EV-2, at 3-13R2 to 3-14R2; EFSB-PA-16). The Company contends that the phase conductor separation between each of the separated 115 kV lines would be "the same as in the current DCT configuration" and is not advantageous (Exh. EFSB-PA-16).

In addition, the Company maintains that it would face difficulty scheduling outages of the existing lines in order to install the new poles between the existing 345 kV and 115 kV transmission support structures (Exh. EFSB-PA-16). Further, the Company suggests that reliability concerns would be introduced during the construction period for Transmission

Alternative 2 if a line were to trip out while an existing line is out-of-service in order to install the new monopoles between the existing 345 kV and 115 kV transmission structures (Exh. EFSB-PA-16). The Company asserts that Transmission Alternative 2 is also more costly than Transmission Alternative 1 by approximately $3 million (id.).

The Company argues that although the cost of Transmission Alternative 3 is less than Transmission Alternative 1, the reliability and operational benefits would be reduced because it would only segment the proposed new 115 kV line, and would not provide segmentation for the two other existing 115 kV lines (Exh. EV-2, at 3-14R2). The Company also indicates that Transmission Alternative 1 would reduce the exposure to an area of load loss by more than Transmission Alternative 3 (Exhs. EFSB-PA 18; EFSB-PA-90).

With respect to Transmission Alternative 4, the Company contends that it would have comparable reliability benefits to Transmission Alternative 1, but would involve the expansion of the existing Dean Street Substation, which is surrounded by wetlands, and construction of a new 3.3-mile third overhead 115 kV transmission line to Norwood on the ROW with wetlands impacts (Company Brief at 62, citing Exh. EV-2, at 3-14R2).

According to the Company, Transmission Alternative 5 would involve the expansion of the existing Canton Substation and construction of a new third overhead 115 kV transmission line to Canton on the narrow railroad ROW (id.). The Company contends that Transmission Alternative 5 would be less expensive than Transmission Alternative 1, but would not realize the same level of reliability benefits because Transmission Alternative 5 would have a post-construction maximum exposure to dropped load of 206 MW compared to 182 MW for Transmission Alternative 1 (Company Brief at 62, citing Exh. EV-2, at 3-14R2).

According to the Company, Transmission Alternative 6 would have comparable reliability benefits to the Project, but would have a higher cost (Exh. EV-2, at 3-14R2). The Company maintains that it did not choose Transmission Alternative 6 because of its higher cost and the related construction impacts (id.).

The Company acknowledges that Transmission Alternative 7 would be less costly than Transmission Alternative 1, but argues that it would not provide significant reliability benefits to the Walpole-Holbrook area (Company Brief at 62, citing Exh. EV-2, at 3-14R2; RR-EFSB-23; Tr. 2, at 189). Transmission Alternative 7 would result in a higher level of load loss for various

contingencies compared to Transmission Alternative 1 (Company Brief at 63, citing RR-EFSB-23).

C. Identification of Non-Transmission Alternatives for Analysis

The Company stated that it considered the potential for local generation with continued or increased use of energy efficiency and demand-response programs in the Walpole-Holbrook area as an alternative to the Project (Exh. EV-2, at 3-14R2).

1. Non-Transmission Alternatives to the Proposed Sharon Switching Station

According to the Company, the proposed switching station in Sharon would mitigate a loss of supply to load served by the Walpole, Norwood/Ellis, Canton/Amtrak, and Randolph Substations for an N-1-1 simultaneous loss of two area 115 kV lines followed by the loss of the proposed new 115 kV line (Exh. EV-2, at 3-16R2). With the new line and Sharon Switching Station, the loss of supply for an N-1-1 event would be reduced from 306 MW to not more than 182 MW (i.e., a 124 MW reduction in potential lost load) (id.). The Company stated that a minimally equivalent NTA to the switching station would need to reduce or supply (within 30 minutes) at least 127 MW of load that would otherwise be lost for the worst N-1-1 contingency (id.). According to the Company, using local generation for this purpose would present significant issues such as frequency control, generation trips, generator and lead-line siting, land availability, high capital costs compared to the cost of the proposed switching station, permitting and environmental consideration, and fuel supply availability (Exh. EV-2, at 3-17R2). The Company estimated the cost of constructing a suitable replacement 160 MW generator to be $1,000/kW, or $160 million (id.).

2. Non-Transmission Alternatives to New 115 kV Line

According to the Company, the proposed third 115 kV line mitigates a loss of supply to load served via the Walpole, Dean Street, Ellis, Canton and Amtrak Substations, for an N-1 simultaneous loss of two area 115 kV lines (Exh. EV-2, at 3-15R2). With the proposed third 115 kV line, the loss of supply for this N-1 event would be reduced from 275 MW to 30 MW (id.). The Company maintains that, to achieve a reliability benefit equivalent to the proposed

115 kV transmission line, a non-transmission alternative would also need to be able to supply some or all of the up to 245 MW of area load that would otherwise be lost following the same N-1 event (id.).

According to the Company, an all-generation NTA would require continuous production of 245 MW of electrical power to the local substations in order to be ready to immediately replace power that is normally supplied on peak via the existing transmission infrastructure (id.). The Company maintains that such generation would present significant issues, such as land availability and high capital costs compared to the cost of the proposed new 115 kV line, permitting and environmental considerations, fuel supply availability, and interconnection requirements at substations (id.).

The Company stated that the required amount of generation could be reduced by increased implementation of EE and DR programs, as well as by any new distributed generation that an individual customer could install and employ while disconnected from the local distribution system (id.). However, the Company stated that the Company's EE programs are expected to deliver approximately 50 to 60 MW of reduction annually across its entire service territory (Exh. EV-2, at 3-16R2). As a result, the Company maintained that additional EE and DR would unlikely be sufficient to substantially reduce the amount of local generation needed for a successful NTA (id.).

D. Analysis and Findings on Alternative Approaches

1. Reliability

Each of the Company's identified transmission alternatives would reduce the existing transmission system exposure to customer load interruptions under certain contingencies to a level below 300 MW, but none of the identified alternatives, including Alternative 1 (the proposed Project) would completely eliminate the potential for interruption of some customer load as a result of certain N-1-1 scenarios. After Project construction, the amount of customer load potentially interrupted in an N-1-1 scenario varies, with the maximum amount less than 200 MW in Transmission Alternatives 1, 2, and 6, and exceeding 200 MW in Transmission Alternatives 3, 4, 5, and 7. Therefore, with respect to its evaluation of reliability benefits, the Siting Board focuses on the choice between Transmission Alternatives 1, 2, and 6.

Transmission Alternative 2 provides the greatest reduction (324 MW down to 160 MW) to the maximum potential customer load loss from an N-1-1 contingency. Although the new conductors would no longer be on shared support structures, the phase conductor separations would be approximately the same as in the DCT configuration. Therefore, the actual reliability benefit of Transmission Alternative 2 may be less than the benefit predicted by N-1-1 modeling results. Further, the record shows that reliability could be reduced during the construction period because existing lines would have to be taken out of service to install the new monopoles.

Transmission Alternative 6 has a comparable post-construction exposure to dropped load of 182 MW, which is comparable to that of Transmission Alternative 1 (189 MW) and Transmission Alternative 2 (160 MW). However, Transmission Alternative 1 provides superior reliability benefits compared to Transmission Alternatives 2 and 6 because it is the only transmission alternative that doubles the number of transmission circuits between the West Walpole Substation and the Holbrook Substation by segmenting/dividing the existing three circuits into six shorter circuits – three 115 kV transmission circuits between the West Walpole Substation and the proposed Sharon switching station, and three additional separate 115 kV transmission circuits between the proposed Sharon switching station and the Holbrook Substation. This is accomplished by the use of a proposed switching station in Sharon. In addition, the design of the switching station, which would be constructed to allow for future addition of transformers at the site, would allow for future expansion flexibility. Transmission Alternative 2 provides no segmentation of the existing two 115 kV circuits or the new proposed 115 kV circuit, and Transmission Alternative 6 would provide segmentation only for the proposed new 115 kV line, but not for the two existing 115 kV lines between the West Walpole and Holbrook Substations. Accordingly, Transmission Alternative 1 is preferable with respect to reliability compared to Transmission Alternatives 2 and 6.

As described above, the Company identified a number of potential alternative approaches to meeting the identified need. The Siting Board notes that EE and DG are important resources for reducing greenhouse gas emissions and may also serve to reduce or postpone the need for infrastructure such as transmission lines in certain applications. However, the Siting Board agrees with the Company that, in this case, EE and DG cannot serve the function of the existing cables in the regional transmission network. Based on the inability of the non-transmission

alternatives to meet the identified need, the Siting Board finds that these alternatives do not warrant further consideration in this case. The Siting Board continues to expect that Eversource will strongly encourage its customers, both existing and new, to take full advantage of EE programs.

2. Environmental Impacts

The record shows that the environmental impact of each of the seven transmission alternatives includes 0.6 acres of tree clearing at the existing Holbrook Substation. Additional environmental impacts vary between two groups of transmission alternatives: (1) those that require a new switching station; and (2) those that do not require a new switching station, but require instead some number of additional transmission structures in existing ROWs. Transmission Alternatives 1 and 3 require a new switching station in Sharon, which the Company reports would necessitate 1.3 acres of tree clearing with some amount of visual impacts in the surrounding community caused by a new switching station. Alternative 1 would also require the permanent loss of 150 square feet of wetlands; Alternative 3 would cause the loss of 60 square feet of wetlands.

The environmental impacts associated with the construction of a new switching station would be avoided in Transmission Alternatives 2, 4, 5, 6, and 7. Each of these alternatives, however, adds other incremental environmental impacts, including, at a minimum, new transmission structures to be constructed in existing ROWs. In the case of Alternative 2, approximately 99 new transmission structures would be required between Walpole and Holbrook, 18 of which would be located in bordering vegetated wetlands ("BVW"), resulting in 540 square feet of permanently filled wetlands. Alternatives 4 and 6 would require the construction of approximately 34 new transmission structures and 12.5 acres of tree clearing. Alternative 5 would require approximately ten new transmission structures and would cause the permanent loss of 180 square feet of wetlands. Alternative 7 would cause the permanent loss of 60 square feet of wetlands.

The Company asserts that all of the transmission alternatives would have similar, low environmental impacts. However, the seven transmission alternatives all require tree clearing of between 1.3 acres (Alternatives 1 and 3) up to 12.5 acres (Alternatives 4 and 6). Although visual

impacts would be somewhat heightened by the addition of a new switching station (Alternatives 1 and 3), visual impacts would also occur with the construction of additional monopoles (Alternatives 2, 4, 5, and 6). The amount of new monopoles varies from a low of ten for Transmission Alternative 5, up to 99 for Transmission Alternative 2. With no new switching station, no additional monopoles, and with the loss of only 60 square feet of wetlands, the Siting Board finds that Transmission Alternative 7 is preferable to the other alternatives with respect to environmental impacts.

3. Cost

In considering the cost of the transmission alternatives, Transmission Alternative 7 is preferable to the other transmission alternatives because it is the least expensive ($25.3 million). The Company's Project (Alternative 1) is expected to cost approximately $34.6 million, $9.3 million more (37 percent more) than Alternative 7.

4. Conclusion

Transmission Alternatives 3, 4, 5, and 7 provide some reduction to the (maximum) dropped load exposure under N-1-1 contingencies from 324 MW to 226 MW, however not as great a reduction as Transmission Alternatives 1, 2, and 6, which reduce the dropped load exposure from 324 MW to 189 MW, 160 MW, and 182 MW, respectively (see Table 2). Transmission Alternative 3 would cause comparable environmental impacts to Transmission Alternative 1 because these two alternatives have the same line work and include construction of a new switching station; however, the difference in cost is not enough to justify the lower reliability benefit offered by Transmission Alternative 3. Transmission Alternative 4 is inferior to Transmission Alternative 1 with respect to environmental impacts and cost, as well as being inferior with respect to reliability. Transmission Alternative 5 is inferior to Transmission Alternative 1 with respect to both reliability and cost, and has different but not substantially less environmental impact compared to Alternative 1.

Transmission Alternative 6 would reduce the dropped load exposure under N-1-1 contingencies from 324 MW to 182 MW, which is comparable to Transmission Alternative 1. However, it would segment only the proposed new 115 kV line, such that faults on the remaining

two circuits would not be isolated, whereas Transmission Alternative 1 would segment each of the three 115 kV circuits in the ROW. Transmission Alternative 1 also enables potential future expansion, which is not provided by Transmission Alternative 6. Transmission Alternative 6 includes significant ROW clearing compared to Transmission Alternative 1, requiring 12.5 acres of tree clearing compared to 1.3 acres of tree clearing (for the switching station) for Transmission Alternative 1. With a mixed reliability comparison, but clearly inferior environmental characteristics and cost, Transmission Alternative 6 is not preferable to Transmission Alternative 1.

Transmission Alternative 7 would reduce the dropped load exposure under N-1-1 contingencies from 324 MW to 246 MW, which is inferior to the 189 MW dropped load exposure for Transmission Alternative 1. However, Transmission Alternative 7 has a significantly lower cost ($25.3 million compared to $34.6 million). Transmission Alternative 7 provides circuit segmentation on a single circuit only, compared to three-circuit segmentation with Transmission Alternative 1, and no future expansion potential. Transmission Alternative 7 has less environmental impact compared to Transmission Alternative 1. However, given its inferior reliability characteristics, its lower cost and environmental impacts are not sufficiently advantageous to make it preferable.

Finally, Transmission Alternative 2 would reduce the dropped load exposure under N-1-1 contingencies from 324 MW to 160 MW, a favorable outcome compared to the reduction to 189 MW for Transmission Alternative 1. However, Transmission Alternative 2 would provide no additional segmentation or future opportunity for expansion, as it does not include a new switching station or any new breakers. Its cost exceeds Transmission Alternative 1 by approximately $3 million. Although there is no tree clearing needed for a new switching station under Transmission Alternative 1, Transmission Alternative 2 requires 99 new monopoles and 540 square feet of permanently-filled wetlands. Although Transmission Alternative 2 has comparable environmental impacts to Transmission Alternative 1; it is more costly, and provides neither segmentation of the three circuits, nor potential future expansion, thereby making Transmission Alternative 1 preferable to Transmission Alternative 2.

Based on the analysis above, the Siting Board finds that Transmission Alternative 1, the proposed Project, is superior to the other identified non-transmission and transmission

alternatives in its ability to meet the identified need balancing considerations of providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

V. ROUTE SELECTION

A. Standard of Review

G.L. c. 164, § 69J requires a petition to construct to include a description of alternatives to the facility, including "other site locations." Thus, the Siting Board requires an applicant to demonstrate that it has considered a reasonable range of practical siting alternatives and that its proposed facilities are sited in locations that minimize cost and environmental impacts. To do so, an applicant must meet a two-pronged test. First, the applicant must establish that it developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner that ensures that it has not overlooked or eliminated any routes that, on balance, are clearly superior to the proposed route. Second, the applicant generally must establish that it identified at least two noticed sites or routes with some measure of geographic diversity. Mystic-Woburn at 26; Salem Cables at 34-35; Stoughton/Boston at 32-33. But see Colonial Gas Company d/b/a National Grid, EFSB 16-01, at 28 (2016), where the Siting Board found the Company's decision not to notice an alternative route to be reasonable.

B. The Company's Route Selection Process

The Company identified possible routing for its Project as follows. As a first step in developing geographically diverse routing options for assessment, the Company demarcated a roughly 152-square-mile area between the Walpole and Holbrook Substations for study and identified linear corridors for evaluation within the study area (Exh. EV-2, at 4-1). The Company stated that all routing options addressed the need to separate the existing DCT configuration of Lines 146-502 and 447-508 between the West Walpole Substation and Walpole Substation (id. at 4-1, 4-2). Thereafter, the routing study area encompassed an area north and south of the Walpole and Holbrook Substations to allow for routing opportunities for the New Line that would provide a connection between the Walpole and Holbrook Substations (id. at 4-2). The Company used maps from the United States Geological Survey ("USGS") and the

Massachusetts Geographic Information System ("MassGIS") in addition to aerial photography and field reconnaissance of the area to identify existing linear corridors that might present routing opportunities (id.). These linear corridors included transmission ROWs, active and abandoned rail beds, road and highway layouts, and a gas pipeline ROW (id.).

The Company relied on two basic guidelines in selecting routes for evaluation: (1) use direct routes as opposed to more circuitous routes; and (2) use existing ROWs and easements, where possible (Exh. EV-2, at 4-2). The Company anticipated that each guideline would contribute to reducing the disruption, environmental impacts, and costs of Project construction (id.). Using its guidelines, the Company identified an initial set of six route options that included three overhead routes, two all or mostly underground routes, and one "hybrid" route with both underground and overhead components (id. at 4-3). The Company maintained that its initial universe of routing options was comprehensive and ensured that no superior route was overlooked (id.). The Company anticipated that ensuring reliability would require construction of a switching station along its new line regardless of the routing alternative selected (id.).

The Company compared the six candidate route options on the basis of general constructability, human environment factors, and natural environment factors, cost, and reliability (id. at 4-1, 4-10 to 4-21). General constructability criteria included route length, ownership, existing infrastructure, occurrence of bedrock, density of existing utilities along the route, and construction period restrictions (id. at 4-11 to 4-13). The human environment category reflected general land uses and densities and the potential for disruption to residential, commercial-retail-industrial, recreational, and sensitive land uses (i.e., locations used for schools and day care centers, facilities for seniors, medical centers, police and fire headquarters) (id. at 4-13 to 4-15). The natural environment category was based on the length of the route through protected species habitat and potential crossings of areas of critical environmental concern ("ACECs"); the number of nearby certified and potential vernal pools; and the acreage of affected bordering vegetated wetlands ("BVW") and riverfront area crossings (id. at 4-15 to 4-17). For each of the identified criteria, the Company gave each route a score of 1, 2, or 3, with a score of 1 representing the lowest potential impact (id. at 4-11).

The Company assigned multipliers of one to three for each criterion evaluated to represent the importance of the criterion in the scoring process (id. at 4-17 to 4-18).[15] The Company stated that, in using any of the candidate routes, the Project would be equally reliable and that the Company, therefore, did not include reliability as a selection criterion (id. at 4-21). The Company also developed preliminary cost estimates for the candidate routes. Table 3, below, provides weighted scores and costs of the six route options.

Table 3. Weighted Scores and Costs of Candidate Routes

Candidate Route	Description	Length (Miles) OH/UG	Environmental Score Ranking	Estimated Cost	Cost Ranking	Weighted Environ-Mental Score
1	Existing NSTAR ROW overhead	14.7/0.0	1	$30 million	1	48
1A	Existing NSTAR ROW underground	0.7/14.0	2	$120 million	4	56
2	Southerly overhead alternative	27.2/0.0	6	$94 million	3	85
3	Northerly underground/ in-road	0.0/20.1	4	$163 million	6	76
4	Northeast to southeast overhead	24.1/0.0	5	$85 million	2	81
5	Existing NSTAR ROW to southeast underground/ in-road	6.5/14.6[(a)]	3	$141 million	5	68

Source: Exh. EV-2, at 4-20 to 4-22.
(a) Later in the Petition, the Company indicated that the total length of this route (the Noticed Alternative) is 17.7 miles (Exh. EV-2, at 5-9).

[15] The Company assigned a triple weight to the following criteria, considered particularly significant: length of route, ownership, work within roadways (traffic disruption), and potential impact to conservation lands and open space (Exh. EV-2, at 4-17).

As shown in Table 3, above, Candidate Route 1 had the best ranking from both environmental and cost perspectives (id. at 4-21 to 4-22). The Company attributed this high ranking based on the location of Route 1 on an NSTAR ROW with existing structures able to support circuit conductors for the Project (id. at 4-22). The Company stated that its scoring of Route 1 also reflected the fact that the Company would not have to acquire new property rights along this route or undertake extensive clearing or access road work for Project construction (id.). The Company indicated that these characteristics contrasted favorably with those of other route alternatives; construction of the Project along all other route alternatives would involve acquisition of additional property rights and installation of support structures or conduit (id.).

The Company identified Route 5 as its Noticed Alternative Route (id. at 4-22). The Company stated that its analysis indicated that Route 5 was the only constructible route for the Project other than Route 1; all the other routes would require extensive property rights acquisition, expansion of ROW width, and circuitous and lengthy underground line construction (id. at 4-22). The Company indicated that Route 1A scored better than Route 5 from an environmental criteria perspective, but that Route 5 would provide greater geographical diversity and involve fewer ownership issues than Route 1A (id.).

C. Geographic Diversity

The Company indicated that its Routing Study Area included roughly 152 square miles and portions of the towns of Walpole, Foxborough, Norwood, Sharon, Canton, Stoughton, Easton, Avon, Randolph, Brockton, Holbrook, Braintree, and Abington (id. at 4-1, 4-2). The Company chose Route 5 as its Noticed Alternative Route, which includes: (1) a 4.6-mile overhead segment overlapping the Primary Route along the existing Company ROW; and (2) a 13.1-mile underground in-road segment traveling to the south of the Company's ROW before returning to the ROW at the Holbrook Substation, the Project terminus (id. at 5-9).

D. Switching Station Selection Process

The Company explained that location of the switching station between the Norwood and Canton Taps would maximize electrical benefit (Exh. EFSB-RS-11). Eversource stated that the preferred location for the switching station for Routes 1, 1A, 2, and 5 would be within the

existing ROW, on Eversource-owned property at approximately 63 Canton Street in Sharon ("Canton Street site") (id. at 4-3, 5-23, 5-23).[16] The Canton Street site would allow the Company to sectionalize the transmission lines and physically split the electric load halfway to preserve the electric supply following contingency events (Exhs. EFSB-RS-1; EFSB-RS-10; EFSB-RS-11; Tr. 3, at 350-354). The Company stated that the Canton Street site had been identified in 1968 as a location to sectionalize the existing 115 kV lines, and would be the optimal location for the switching station (Exhs. EFSB-RS-1; EFSB-RS-5). The Company stated it had reviewed three additional parcels on the ROW between the Norwood and Canton Taps, and eliminated two of the three locations because the lots contained single family homes (Exhs. EFSB-RS-1; EFSB-RS-5; EFSB-RS-11, Tr. 3, at 346-349).[17]

The remaining parcel reviewed by the Company is located at approximately 38 Richards Avenue in Sharon, referred to as the Bullard Street site (Exhs. EFSB-RS-2; EFSB-RS-11). The Company compared the Canton Street and Bullard Street sites using parameters such as electrical benefit, site ownership, land use, topography, and transmission line entry (Exh. EFSB-RS-2). With respect to the electrical benefit, the Company stated that there was no difference between the two sites (Exh. EFSB-RS-2). The Bullard Street site is approximately 60 acres and owned by the Town of Sharon; the Company stated that the site is protected conservation land that would require legislative action under Article 97 of the Constitution of the Commonwealth of Massachusetts (Exhs. EFSB-RS-2; EFSB-RS-7; EFSB-RS-12; MFCA-2-2; Tr. 3, at 357-359). Furthermore, the Company asserted that a switching station would not be in compliance with deed restrictions on the property (Exhs. EFSB-RS-11; EFSB-RS-12; MFCA-2-2; Tr. 3,

---

16 The Company did not determine a preferred location for the switching station for Candidate Routes 3 and 4, as those routes were eliminated during the route selection process (Exh. EV-2, at 4-3).

17 The Company reviewed five locations suggested by abutters that were not between the Norwood and Canton Taps. Eversource concluded that four of the locations were off the ROW, and were not considered because they would require additional in-street transmission infrastructure, resulting in increased construction impacts and costs (Exhs. EFSB-RS-1; EFSB-RS-6; EFSB-RS-10; EFSB-RS-11; Tr. 3, at 351-353). The fifth location is similar to transmission alternatives presented as project alternatives to the Project, and would require additional transmission infrastructure between the ROW and the Amtrak Station (Exh. EFSB-RS-1; EFSB-RS-6).

at 357-359).[18] Additionally, the Bullard Street site consists of various elevations and would require more civil engineering work (Exh. EFSB-RS-2; Tr. 3, at 359-360). The Company concluded that the Canton Street site would be the optimal location for a switching station (Exh. EFSB-RS-5).

E. Analysis and Findings on Route Selection

The Company identified a study area encompassing all reasonable siting options for the Project given the limitations imposed by an interconnection between the Walpole and Holbrook Substations. Although various segments of the analyzed routes overlap, or lie fairly close to each other, each route identified by the Company incorporates some measure of geographic diversity, and has varying environmental impacts.

The Siting Board requires that applicants consider a reasonable range of practical siting alternatives and that proposed facilities are sited in locations that minimize cost and environmental impacts. In past decisions, the Siting Board has found various criteria, including, but not limited to, natural resources, land use, community impact, cost, and reliability criteria, to be appropriate for identifying and evaluating route options for transmission lines and related facilities. Mystic-Woburn at 31-32; Salem Cables at 38; Hampden County at 38. The Siting Board has also found the specific design of scoring and weighting methods for chosen criteria to be an important part of an appropriate site selection process. Mystic-Woburn at 31; Salem Cables at 38-39; Hampden County at 37. In the instant case, the Company has developed a range of screening criteria to evaluate its routing options. The Siting Board has previously found the types of criteria used by the Company here to be acceptable for route selection. The Company has also developed a quantitative system for ranking routes based on the compilation of weighted scores across all criteria, a type of evaluation approach the Siting Board also has found previously to be acceptable. Mystic-Woburn at 32; Salem Cables at 38-39; Hampden County at 38.

---

[18] The Company submitted a copy of the "deed with restrictions" governing use of the Bullard Street Site by the Town of Sharon and all future owners (Exhs. EFSB-RS-12; EFSB-RS-12(1)).

The Siting Board observes that the Company's Noticed Alternative Route is geographically diverse vis-à-vis the Primary Route and that the Company has, therefore, established two routes for the Project with some measure of geographic diversity. In addition, the Siting Board observes that using the Canton Street site would minimize environmental impacts of switching station construction along the Primary or the Noticed Alternative Route.[19]

The Siting Board concludes that the Company has: (1) developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner that ensures that it has not overlooked or eliminated any routes superior to the proposed Project; and (2) identified a range of practical transmission line routes with some measure of geographic diversity. Therefore, the Siting Board finds that the Company has demonstrated that it examined a reasonable range of practical siting alternatives and that its proposed facilities are sited in locations that minimize cost and environmental impacts.

VI. ANALYSIS OF THE PRIMARY AND NOTICED ALTERNATIVE ROUTES

In this section, the Siting Board compares the Primary Route and the Noticed Alternative Route, based on environmental impacts, cost, and reliability. Based on the evidence and findings presented below, the Siting Board concludes that the Primary Route is superior to the Noticed Alternative Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

A. Standard of Review

In implementing its statutory mandate under G.L. c. 164, §§ 69H, 69J, the Siting Board requires a petitioner to show that its proposed facility is sited at a location that minimizes costs and environmental impacts while ensuring a reliable energy supply. To determine whether such a showing is made, the Siting Board requires a petitioner to demonstrate that the proposed route for the facility is superior to the alternative route on the basis of balancing environmental impact,

---

[19] The Company has entered into an HCA with the Town of Sharon and a Settlement Agreement with MacIntosh Farms that address impacts related to the Canton Street site (Exhs. EV-7; EV-8).

cost, and reliability of supply. Mystic-Woburn at 33; Salem Cables at 39; Stoughton/Boston at 32-33.

The Siting Board first determines whether the petitioner has provided sufficient information regarding environmental impacts and potential mitigation measures to enable the Siting Board to make such a determination. The Siting Board then examines the environmental impacts of the proposed facilities along the Primary and Noticed Alternative Routes and determines: (1) whether environmental impacts would be minimized; and (2) whether an appropriate balance would be achieved among conflicting environmental impacts as well as among environmental impacts, cost, and reliability. Finally, the Siting Board compares the Primary Route and the Noticed Alternative Route to determine which is superior with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

B. Description of the Primary and Noticed Alternative Routes

1. Primary Route

The Company's Primary Route would extend approximately 14.7 miles along its existing ROW between the West Walpole and Holbrook Substations (Exh. EV-2, at 5-7). Along the first 0.64-mile-long segment of the route, running east along the ROW between the Company's West Walpole and Walpole Substations, the Company would separate the existing DCT configuration of 115 kV Lines 146-502 and 447-508 by (a) moving the north 115 kV line conductors to eight new monopole structures and (b) constructing a new 115 kV segment (id. at 4-1, 5-8). The Company would also replace six other structures in essentially their present location within the Company's ROW between Walpole and Holbrook substations which varies in width from approximately 300 to 800 feet (id. at 5-8).

The ROW now consists of: (1) a lattice-work DCT with two 115 kV circuits, Lines 447-508 and 447-509, on the south side of the ROW; and (2) a lattice-work DCT, occupied only on one side with a 345 kV transmission line (Line 3161/316) (id. at 2-2R2, 5-7 to 5-8). Line 3161, a 345 kV circuit, extends from the West Walpole Substation to the Stoughton Switching Station; Line 316, another 345 kV circuit, extends from the Stoughton Switching Station to the Holbrook Substation; no transmission lines are currently located on the north side

of the structures holding Line 3161/316 (id. at 2-5R2). Along the approximately 14 miles of the Primary Route from the Walpole to Holbrook Substations, the Company would install new 115 kV line conductors on the north side of the existing DCTs, located along the north side of the Company's approximately 150-foot-wide ROW segment between the Walpole and Holbrook Substations which is cleared to its full width (id. at 5-7 to 5-8).

The Company's ROW between the West Walpole and Holbrook Substations travels through seven towns – Walpole, Sharon, Canton, Stoughton, Avon, Randolph, and Holbrook – and crosses a mix of land uses, including dense residential and industrial developments, forested areas, a wildlife sanctuary, three railroad crossings, and several major highway crossings (id. at 5-8). The Company's existing property rights along its ROW allow for the construction and maintenance of overhead lines; the Company stated that construction and operation of the Project would not require any additional property rights (id.).

As part of its Project, the Company would construct a three-breaker switching station on a Company-owned parcel on Canton Street in Sharon (id. at 5-9). The Company would also make modifications to the existing substations in West Walpole and Holbrook (id. at 1-1R2).

2. Noticed Alternative Route

The Noticed Alternative Route would, like the Primary Route, separate the existing DCT configuration of Lines 146-502 and 447-508 between the West Walpole and Walpole Substations by the construction of a new 0.64-mile 115-kV line segment on new structures (Exh. EV-2, at 4-3). From the Walpole Substation, the Noticed Alternative Route would follow the existing Company ROW corridor east for approximately 4.6 miles to the intersection of the ROW with Canton Street in Sharon (id. at 5-9). As along the Primary Route, the Company would construct the proposed Sharon Switching Station on Canton Street and modify the West Walpole and Holbrook substations (id. at 1-1R2, 5-9).

At the Sharon Switching Station, the Noticed Alternative Route would transition underground, turning east on North Main Street into Stoughton (id. at 5-9). The Noticed Alternative Route would continue onto Sharon Street and Central Street for approximately 5.7 miles to the Avon town boundary, then continue east across Route 24 to follow Harrison Boulevard for approximately 1.9 miles, where it would briefly turn north onto Route 28 (id.).

The Noticed Alternative Route would thereafter head north, east, and south into Holbrook to re-join the Company's ROW and reach the Holbrook Substation (id.; see Section I.A, Figure 1, above). The overhead segment of the Company's hybrid overhead/underground Noticed Alternative Route would be 5.2 miles; the underground segment would be 12.2 miles (id.). The length of the Noticed Alternative Route would therefore be 17.7 miles, or 3.0 miles longer than the 14.7-mile Primary Route (id. at 4-21, Table 4-3).

3. Sharon Switching Station

Both the Primary Route and the Noticed Alternative Route for the Project would include a proposed three-breaker switching station on a Company-owned parcel on Canton Street in Sharon (Exhs. EV-2, at 5-9). The Company described the Company's Sharon Switching Station site as bounded to the north and east by forested land, to the south by the Company's ROW, and to the west by Canton Street (id. at 5-23). The Company indicated that the area of its Canton Street parcel was 579,290 square feet; construction of the Sharon Switching Station as proposed would involve fencing approximately 13,000 square feet and clearing approximately 50,200 square feet (Exhs. EFSB-A-1; MFCA-1-7(1) at 35; MFCA-1-9(1)).

The Company stated that, for each 115-kV line connected, the proposed Sharon Switching Station would consist of one 115-kV circuit breaker in series with gas-insulated switchgear ("GIS"); the design would allow future expansion to a breaker-and-a-half configuration (Exh. EV-2, at 3-4R2). All line entrances and exits to the Sharon Switching Station would be underground with four transition structures nearby outside the station fence on the ROW (id.).

C. Environmental Impacts

1. Land Use and Historic Resource Impacts

a. Primary Route

The Company stated it would install the Project using conventional overhead construction techniques (Exh. EV-2, at 5-2). The Company indicated that construction activities would progress sequentially as follows: (1) re-delineation of wetland resources and other sensitive resources adjacent to work areas and access roads; (2) installation of erosion and

sedimentation control measures; (3) development of work areas; (4) installation of new line structures where required; (5) installation of conductors and lightning shield wires; and, (6) restoration of the ROW corridor (id. at 5-2).

The Company stated that utility-related uses dominate the Primary Route, which follows an existing overhead utility ROW owned by the Company (id. at 5-12). The Company characterized most of the land in the vicinity of the Primary Route as conservation and recreation land, but also reported 658 sensitive receptors between 25 and 300 feet of the edge of its ROW (id. at 5-12; EFSB-LU-1(1); EFSB-LU-2; EFSB-MF-14(1)). Of these 658 receptors, the Company indicated that 93 buildings were part of the Greenbrook Condominium Complex in Stoughton; these 93 buildings encompassed 630 residential units (Exhs. EFSB-LU-10(1); EFSB-LU-20(1); EFSB-MF-14(1)).

The Company indicated that no part of the Project would involve conversion of land held for natural resource purposes in accordance with an Article 97 designation (Exh. EFSB-LU-5). Along the Primary Route, the Company reported 127 properties inventoried as historic cultural resources, six properties in the National Register, and 37 archeological sites (Exh. EV-2, at 5-19).

The Company indicated that the Massachusetts Historical Commission ("MHC") had reviewed Project impacts to historic or archaeological land uses in the Project area, including visual impacts to nearby historic land uses (to a half-mile from the Project) (Exh. EFSB-LU-23). The Company stated that the MHC had also reviewed impacts to historic or archaeological land uses in the path of the Project (id.). The Company reported that, in a February 24, 2014 letter to the Company, the MHC indicated that the Project would not likely have an adverse impact on intact, significant historic and archaeological resources (Exh. EV-3, App. 5-2). Furthermore, the MHC indicated that Sharon Switching Station construction was not proposed within a nearby historic cemetery and would be consistent with the existing environment of the Project, including the existing electrical transmission ROW (id.).

The Company anticipated that Company-owned property, substations, and land within the ROW would be the primary locus of staging and laydown sites for the Project along the Primary Route (Exhs. EFSB-LU-16; EFSB-LU-24; EFSB-LU-25). The Company indicated that its contractor would have principal responsibility for identifying staging and laydown locations for

construction vehicles and materials (Exhs. EFSB-LU-16; EFSB-LU-24; EFSB-LU-25). The Company stated that it and/or its contractors would secure commercially available property suitable for construction staging and laydown in the event that additional areas not on Company-controlled property were required (Exhs. EFSB-LU-16; EFSB-LU-24; EFSB-LU-25).

Along the Primary Route in the vicinity of the Holbrook Substation, the Company anticipated removing 0.14 acres of trees in forested wetlands and 0.46 acres of trees in forested uplands to construct three new transmission structures approaching the Holbrook Substation, but not tree removal for construction-related upgrades to the Holbrook Substation itself (Exhs. EFSB-VM-1; EFSB-VM-2; EFSB-VM-2(1)). The Company indicated it would not likely restore or replace trees removed by construction activities and operation of the Project along the Company's ROW (Exh. EFSB-LU-22).

The Company stated that the mechanical portion of its vegetation program would comply with an annual Vegetation Management Plan ("VMP") approved by the Massachusetts Natural Heritage and Endangered Species Program ("NHESP") (Exhs. EFSB-LU-18; EFSB-VM-3(1)). The VMP, according to the Company, would avoid or minimize potential harm to protected species, including nesting birds, from cutting and mowing operations by implementing best management practices adopted in consultation with NHESP (id.; Exhs. EFSB-VM-3(1); EFSB-LU-18). NHESP would also require the implementation of special care and measures aimed at helping avoid impacts to state-listed plants, amphibian species, invertebrates, and turtles to the extent possible (Exh. EFSB-LU-14(1)).

The Company indicated that the Massachusetts Division of Agricultural Resources would separately regulate herbicide use under a five-year VMP and an annually approved Yearly Operational Plan (id.).

The Company anticipated managing any Project-affected vegetation with an Integrated Vegetation Management Program ("IVM") established by the Company for existing facilities (Exh. EFSB-LU-22). The Company stated that its IVM Program controlled problematic tree species and certain invasive plants while allowing for preservation of low-growing plant species and establishment of an early successional, scrub-shrub community (id.). The Company indicated that it had not identified off-ROW trees that posed a danger to its facilities ("danger trees"), but stated that if it did identify danger trees, it would trim them in a manner that would

protect power lines but keep the trees healthy (id.). The Company reported that if danger trees required removal, the Company would contact the appropriate land owner to request permission to go forward with proposed vegetation management measures (Exh. EFSB-VM-1).

b. Noticed Alternative Route

The Company stated it would install the overhead portion of the Noticed Alternative Route with the same methods as discussed above for the Primary Route (Exh. EV-2, at 4-9 to 4-10). From the Sharon Switching Station, however, the Noticed Alternative Route would continue underground to its terminus at the Holbrook Substation (id.). The Company indicated that the Noticed Alternative Route has a higher percentage of residential and commercial land uses than the Primary Route (id. at 5-12).

The Company indicated that open space, conservation and recreational lands within 100 feet of the Noticed Alternative Route (66.9 acres) would be approximately one-third less than that along the Primary Route (99.3 acres) (id. at 5-14). Despite these differences, the Company deemed the two routes equal with respect to open space, conservation, and recreational land uses because construction of the Project along either route would involve no additional clearing or other impacts to its ROW (id. at 5-12 to 5-14). The Company identified no significant differences between land use impacts of the Project along the Primary Route or the Noticed Alternative Route with respect to the Company's VMP, its IVM Program, or construction staging and laydown (id.; EFSB-VM-1). The Company indicated that there would be no tree removal in forested wetlands or uplands in the vicinity of the Holbrook Substation (Exhs. EFSB-VM-1; EFSB-VM-2; EFSB-VM-2(1)).

Along the Noticed Alternative Route, the Company reported 127 properties inventoried as historic cultural resources, six properties in the National Register, and 37 archeological sites (Exh. EV-2, at 5-19). The MHC's review of potential impacts at the proposed Sharon Switching Station along the Primary Route would also apply to the Noticed Alternative Route (id. at 5-9, 5-19). According to the Company, the Project would have fewer historical and cultural resource impacts along the Primary Route because of fewer inventoried properties, archaeologically sensitive areas, and archeological sites relative to the Noticed Alternative Route (id. at 5-19).

c. Positions of the Parties

With respect to land use, Elaine Hyland expressed concern about the possibility that construction would disturb valuable wildlife habitat, including habitat of state-listed turtles, and the Company's vegetation management practices (Hyland Brief at Part 1, Part 2). Ms. Hyland asserts that the Company should protect wildlife and wildlife habitat potentially endangered by the location and timing of construction (Exh. EFSB-EH-LU-4). Ms. Hyland reported vegetation management activities performed by the Company in its ROW in July 2016 as one basis of her concerns regarding the Company's handling of vegetation management (Hyland Brief at Part 2).[20]

Nancy Munroe expressed concern about property damage previously caused by the Company (Tr. 5, 633-650). Ms. Munroe stated that, over a ten-year period, Company activities had destroyed planted pasture and paddock fencing, and that the Company had left trash, mechanical parts, and tree trunks on her property instead of using proper disposal (id.; Munroe Reply Brief at 6). Ms. Munroe stated that while she had repeatedly received assurances that Company representatives would contact her regarding prior property damage claims, the Company had not only failed to resolve past issues regarding her property, but it had also failed to follow through on assurances provided in the current proceeding (Tr. 2, 285-287; Tr. 5, 634-635; Munroe Reply Brief at 7). Ms. Munroe stated that her concerns reflect prior construction practices of the Company at the Stoughton Switching Station relating to earlier projects (Munroe Reply Brief at 1-3). She argues that the Company's inadequate corridor restoration for past projects heightened the importance of ensuring that the Company to carry out its land restoration promises with respect to the current Project (id. at 6-9).

The Company indicated that it would investigate what had occurred on Ms. Munroe's property in the past and see how the Company might remedy any "unanswered situation" (Tr. 5, at 634).

---

[20] Ms. Hyland also questions whether the Company should be exempted from certain zoning ordinances related to land use; the Siting Board considers this issue in Section IX (Hyland Brief at Part 4).

d. Analysis and Findings

The record shows that locating the additional circuit on an open position on existing DCTs would have minimal land use impacts. The Primary Route uses such an open position from the Walpole Substation to the Holbrook Substation, requiring new poles only from the West Walpole Substation to the Walpole Substation. The Noticed Alternative Route would have the same land use impacts from the West Walpole Substation to the proposed Sharon Switching Station. Therefore, environmental impacts would be comparable from the West Walpole Substation to, and including, the Sharon Switching Station. The Settlement Agreement signed by the Company and MCFA resolves differences between the Company and local residents and officials with respect to construction of the proposed Sharon Switching Station.[21] The Company has also signed an HCA with the Town of Sharon regarding this switching station (see Exh. EV-8).

The record shows that the Company has consulted and would work with NHESP to avoid or minimize harm to protected plants and animals during construction, operation, and maintenance of its Project. The Siting Board observes that staging and laydown for the Project would be on Company property consistent with staging and laydown land uses, or on suitable commercially available property.

The record shows that MHC has reviewed the Project as proposed and concluded that it would not likely affect significant archaeological resources and historic land uses, including a historic cemetery near the Sharon Switching Station. The Siting Board notes that survey results show a greater number of inventoried properties, archaeologically sensitive areas, and archaeological sites from the Sharon Switching Station to the Holbrook Substation along the Noticed Alternative Route than along the Primary Route.

---

21 Specifically, the Settlement Agreement aims to resolve visual and other impacts to the public in general and to MacIntosh Farm in particular, of the Company's proposed Sharon Switching Station, and to provide reasonable mitigation of such impacts to MacIntosh Farm residents and the public (Exh. EV-7, at 1). To mitigate visual impacts, the Company agrees to construct its Sharon Switching Station with exterior features and landscaping developed for the MFCA by its consultant, and to require a one-year warranty on landscaping plantings from its landscape contractor (id.). The Company further agrees to maintain the Sharon Switching Station structure, its surroundings, and landscaping in a clean and safe condition for the life of the facility (id.).

East of the Sharon Switching Station, the Primary Route would be shorter than the Noticed Alternative Route and installed along mostly existing poles within an existing ROW. It would therefore have fewer new impacts on local residents and businesses than the Noticed Alternative Route, proposed for underground in-street construction. This assumes the Company's use of construction techniques to limit impacts to natural resources, wildlife, and wildlife habitat along the Company's existing ROW. Accordingly, the Siting Board finds that the Primary Route is preferable to the Noticed Alternative Route with respect to land use and historic resource impacts.

Land use impacts of Project construction would be, for the most part, temporary; however, this would not necessarily be the case for ongoing maintenance of the Primary Route, especially where use of a ROW for overhead transmission lines requires on-going vegetation management. Ms. Hyland and Ms. Munroe have expressed reasonable concerns about vegetation management in such circumstances. The Siting Board directs the Company to follow all applicable guidelines developed to limit wildlife and resource impacts in vegetation management areas. The Siting Board also directs the Company to adhere to construction best management practices, such as the restoration of disturbed areas after construction, including at the Stoughton Switching Substation. In addition, the Siting Board directs the Company to contact Ms. Munroe to fulfill its assurances to her in this proceeding regarding the repair of prior damage to her property (Tr. 5, at 634).

Given implementation of the mitigation measures and conditions discussed above, the Siting Board finds impacts on land use, and historic and archeological resources along the Primary Route would be minimized.

2. Visual

a. Primary Route

As discussed in Section V.B.2.c, above, the Company has two existing 115 kV circuits on an existing DCT configuration between the West Walpole and Walpole Substations; the Company anticipates separating these circuits in conjunction with the Project (Exh. EV-2, at 5-22). The Company would, as such, install eight new monopole structures between Walpole and West Walpole Substations in conjunction with separating the north 115 kV circuit from the

existing DCT configuration (id. at 5-22 to 5-23). The Company would also replace six other structures in essentially the same location, and construct a second control center within the fence-line of the existing West Walpole Substation (id. at 5-23). The Company indicated that modifications to the West Walpole Substation, and between the West Walpole and Walpole Substations, would not increase visual impacts nearby nor alter the existing visual character of the area (id. at 5-22).

The Company indicated that along the Primary Route from the Walpole Substation to the Holbrook Substation, it would install 14.1 miles of new 115-kV transmission line on existing DCTs (id. at 5-23). The Company maintained that the line conductors themselves would be the only new visual elements with respect to this portion of the Primary Route, and would result in only minor changes in visual conditions (id.). To support its contention, the Company provided a photo-simulation of anticipated pre- and post-Project conditions on its ROW (id. at Fig. 5.4).

At the Stoughton Switching Station, construction of three new steel H-frame structures would allow the new line to pass under the existing 345-kV tap lines to the station (id. at 5-23; Exh. EFSB-V-5(1)). The Company anticipated no increased view of the Stoughton Switching Station or existing towers as a result of the construction of the proposed H-frame structures (Tr. 2, at 260-261). The Company stated that the new structures would be shorter than existing structures and constructed within an already cleared ROW (Exh. EV-2, at 5-23; Tr. 2, at 260-261). The Company further stated that construction of the H-frame structures would not require clearance of any additional areas (Tr. 2, at 260-261).

The Company also indicated that, to avoid crossing over existing lines, it would install an overhead/underground transition line for the Project at the Holbrook Substation (Exhs. EV-2, at 5-24; EFSB-V-5(2)). The Company does not anticipate an increase in visual effects of the Project with installation of replacement tap structures or at the Holbrook Substation with the addition of the overhead/underground transition (Exh. EV-2, at 5-24).

A chain link fence would surround the proposed three-breaker Sharon Switching Station (id. at 5-23). An access drive would connect the Sharon Switching Station with Canton Street (id.; Tr. 3, at 324). As indicated by the Settlement Agreement, the Company and the MCFA have agreed to implement certain exterior design features and landscaping in construction of the Sharon Switching Station to mitigate its visual impact on the surrounding neighborhood and

streetscape (Exh. EV-7, at 1). Exterior design features would include wall and roof screening approximately 17 feet high, in addition to landscape design approved by both the Company and MCFA (id.; Exh. EV-8). The Company would require that the landscape contractor provide a one-year warranty on all plantings (Exh. EV-7, at 1).

b. Noticed Alternative Route

The Company indicated that the Primary Route and the Noticed Alternative Route would share an approximately 0.64-mile segment between the West Walpole Substation and Walpole Substation, as well as an approximately 4.6-mile segment from the Walpole Substation to the proposed Sharon Switching Station on Canton Street (Exh. EV-2, at 4-3, 5-9). From the Sharon Switching Station, construction of the Project along the Noticed Alternative Route would continue underground, with transition back to the Company's ROW in Holbrook, near the Project's terminus at the Holbrook Substation (id.). The Company indicated that no visual impacts would occur along the underground portion of the Noticed Alternative Route (id.).

c. Analysis and Findings

Construction of the Sharon Switching Station in accordance with the landscaping and design features contained in the Settlement Agreement and the HCA would mitigate its visual impacts on the surrounding area. For the segment of the Project from the West Walpole Substation to the Sharon Switching Station, the visual impacts are the same along the Primary and Noticed Alternative Routes. Beyond the Sharon Switching Station, the overhead Primary Route would marginally add to existing visual impacts along the Company's ROW heading east from the Sharon Switching Station to the Project terminus at the Holbrook Substation. The eastern portion of the Noticed Alternative Route would be underground until it rejoins the Company's ROW at the Project's Holbrook terminus avoiding permanent visual impacts. The Siting Board therefore finds that the Noticed Alternative Route is preferable to the Primary Route with respect to visual impacts.

In several recent transmission line cases, the Siting Board has directed the petitioners to implement an off-site screening program consisting of vegetative plantings and/or other screening. Here, a comprehensive off-site screening program is not warranted: the Project

would neither add new structures for the majority of the route nor require extensive tree clearing. The Project does, however, have the potential for visual impacts at certain locations along the Primary Route. This is especially a concern where the proximity of transmission lines restricts planting new vegetation within a portion of the Company's ROW. Therefore, the Siting Board directs the Company to offer, on a case-by-case basis, appropriate off-site screening for affected residences in areas of the Project where visual impacts may occur, particularly in the vicinity of the West Walpole to Walpole Substation DCT separation, the Stoughton Switching Station, and the Holbrook Substation. See Lower SEMA at 71; Hampden at 54; GSRP at 104-106.

The Siting Board also recognizes that the appearance of the Company's facilities is essential to the mitigation of Project-related visual impacts on abutting residents and properties. The Siting Board therefore directs the Company to provide, within 60 days of the completion of construction, a report that it has completed the clean-up of all debris (e.g., old poles, fencing, and trash) from the ROW. The report should describe whether the abutters' concerns have been fully addressed. In addition, the Company must meet its ongoing operating and maintenance requirements for its ROW facilities.

With the Company's implementation of the above conditions, the Siting Board finds that the visual impacts along the Primary Route would be minimized.

3. Wetland and Water Resource Impacts

a. Primary Route

Eversource stated that construction of the Sharon Switching Station would include temporary installation of swamp matting and permanent installation of fill, both of which would have wetland resource impacts (Exh. EV-2, at 5-3 to 5-6, 5-10, 5-15 to 5-16). The Company stated that wetland impacts at the Sharon Switching Station would be the only permanent wetland impacts from the Project (id. at 5-16 to 5-17).

Eversource explained that swamp mats would be used within wetland areas to provide access to existing structures, for equipment staging, and during conductor stringing activities (id. at 5-3 to 5-6, 5-16). Eversource indicated that the Project team would delineate updated wetland boundaries prior to the commencement of construction (id. at 5-3). The Company reported that

it would use sedimentation and erosion control barriers to mark the extent of work areas around wetland resources (id.).

The Company filed wetlands documentation with the conservation commissions in Walpole, Sharon, Canton, Stoughton, Avon, Randolph, and Holbrook related to construction work in wetland areas (Exh. EFSB-W-5). The Company received an Order of Conditions for the Project from Walpole Sharon, Canton, Stoughton, and Holbrook (Exhs. EFSB-W-5; EFSB-G-53(1)). Avon and Randolph did not require an Order of Conditions for the Project (Exhs. EFSB-G-53(1); EFSB-W-5).

The Conservation Commission for the Town of Holbrook issued special conditions related to construction activities around a wetland and vernal pool area near Damon Avenue (Exhs. EFSB-W-3; EFSB-W-5(3) at 13). The special conditions include restrictions on construction timing, swamp matting, and tree-trimming (Exh. EFSB-W-5(3); Tr. 4, at 571-572).

The Company utilized MassGIS data to identify the location of drinking water supplies (Zone II and Interim Water Supply areas) within the Primary Route (Exh. EV-2, at 5-18). Eversource identified 331.4 acres of Zone II drinking water supply areas within 100 feet of the centerline of the Primary Route (id. at 5-18). The Company stated that it would mitigate impacts to drinking water supplies by not permitting refueling of construction equipment within 100 feet of marked wetlands, bogs, streams, or ponds, and by providing spill containment and absorption materials in the event of a leak or spill (id. at 5-3, 5-18). With respect to drinking water, Eversource asserted that the Primary Route would be superior to the Noticed Alternative Route, as the Primary Route traverses fewer acres of drinking water supplies (Exh. EV-2, at 5-18).

The Company stated that dewatering activities may be necessary during pole installation near wetland areas (id. at 5-5). During dewatering activities, water would be pumped into areas of nearby upland vegetation (id.). Eversource reported that it would pump water into a sediment filter bag within a settling basin and remove the basin and accumulated sediment from the construction area if adequate upland vegetation would not be available, or if slope conditions would not provide appropriate infiltration (id.).

b. Noticed Alternative Route

Eversource asserted that the Noticed Alternative Route would have similar wetland impacts for approximately the first 5.25 miles of the Primary Route, including work at the Sharon Switching Station (id.). When the Noticed Alternative Route would switch to underground in-road construction, at Canton Street in Sharon, the Company asserted that there would be no permanent wetland impacts along the 12.5 miles of roadway ROW, only potential impacts to buffer zones of wetland resource areas (id. at 4-9 to 4-10, 5-17). Eversource stated that the Noticed Alternative Route would avoid most of the wetland impacts, as the majority of the wetland impacts along the Primary Route would be located within the 9.5 miles of the ROW east of Canton Street, and therefore the Noticed Alternative Route would be the superior route with respect to wetland impacts (id. at 5-17). Eversource identified 493 acres of drinking water protection areas within 100 feet of the Noticed Alternative Route centerline (id. at 5-18). The Company noted that the Noticed Alternative Route traverses more regulated wellhead protection zones, and therefore would be inferior to the Primary Route (id. at 5-18).

c. Sharon Switching Station

The Sharon Switching Station would require five transmission structures that would result in 150 square feet of permanent wetland impacts and temporary impacts from swamp matting (id. at 5-15; Exhs. EFSB-W-1; EFSB-W-4). To mitigate the permanent impacts, the Company proposed 300 square feet of wetland replication in the form of scrub-shrub cover, a 2:1 replacement ratio, in a wetland area adjacent to the Sharon Switching Station (Exh. EFSB-W-4; Tr. 4, at 568-569). Eversource stated that a Notice of Intent would be filed with the Sharon Conservation Commission prior to wetland replication and construction, and would detail the wetland replication process (Exhs. EFSB-W-1; EFSB-W-4).

d. Positions of the Parties

Ms. Hyland states the Project would result in long-term effects within a vernal pool in Holbrook and its surrounding buffer zone, and expresses concerns about construction timing and access to the ROW near the vernal pool (Hyland Brief at 1; Tr. 4, at 598-603). Ms. Hyland recommends that the Siting Board require an Environmental Monitor to be present during

construction at work sites to ensure compliance with all applicable permits (Hyland Brief at 6). Ms. Hyland further notes the importance of a series of special conditions issued in the Order of Conditions by the town of Holbrook in regards to swamp matting and time-of-year restrictions (Hyland Brief at 7-11).

Ms. Munroe indicated concerns with respect to construction of three new pole structures for the Project at the Company's Stoughton Switching Station (Munroe Reply Brief at 1-3; see Section VII.A). Ms. Munroe states that Project construction in this area would alter design and mitigation features of the Stoughton Switching Station (Munroe Reply Brief at 1). Specifically, Ms. Munroe maintains that the location of one of the new structures would be in the location of a berm that was built to provide visual mitigation and assist with stormwater runoff and drainage for the Stoughton Switching Station (id. at 3; Exh. MUNROE-1-1(S-1)).

Ms. Munroe states that during construction of Stoughton Switching Station, she witnessed "muddy" sediment entering the Red Wing Brook from outflow pipes, which she claims originated from the Eversource property, specifically during the dewatering of bore holes (Tr. 2, at 283-284; Munroe Reply Brief at 3). Ms. Munroe indicated that the Company has not identified its construction plans for the new pole structures or performed tests to determine if dewatering would be required; Ms. Munroe further indicated that significant dewatering was needed during the construction of the Stoughton Switching Station (Munroe Reply Brief at 2). She also indicated that dewatering was addressed in the Town of Holbrook Conservation Commission's Order of Conditions for that project (id.).

The Company argues that it demonstrated that it would take appropriate steps to minimize and mitigate wetland and vernal pools impacts in full compliance with applicable local, state, and federal regulations (Company Reply Brief at 2). The Company asserts that the Order of Conditions issued by the Holbrook Conservation Commission was directly a result of the concerns of Ms. Hyland, and that the special conditions would address Ms. Hyland's concerns and adequately protect the vernal pool resource (Tr. 4, at 571-572). Eversource reports it would implement best management practices wherever dewatering would be required, noting in response to Ms. Munroe, that it did not anticipate dewatering would be required near the Stoughton Switching Station (Company Reply Brief at 2). Furthermore, Eversource notes that

existing features and mitigation at the Stoughton Switching Station would not be impacted by the Project (id. at 4).

The Company states that an Environmental Monitor would perform weekly inspections of environmental controls, and an Eversource Construction Inspector would oversee the daily work performed by the contractor (id. at 91).

e. Analysis and Findings

The record shows that the permanent impacts associated with the Sharon Switching Station would occur along both the Primary Route and the Noticed Alternative Route. The majority of wetland impacts on the Primary Route are temporary impacts associated with swamp matting and would be mitigated and minimized; temporary wetland impacts would also be minimized along the Noticed Alternative Route. The Company would minimize permanent wetlands impacts by developing a wetland replication area in the vicinity of the Sharon Switching Station at a 2:1 ratio.

The record indicates that drinking water impacts would be minimized with the Primary Route, because the Primary Route would traverse fewer acres of wellhead protection areas. Neither route, however, proposes construction work directly within wellhead protection areas, as the drinking water impacts are measured by the total acres of wellhead protection within 100 feet of the ROW. The Siting Board finds that, on balance, the Primary Route is comparable to the Noticed Alternative Route with respect to wetland and water resource impacts.

Additionally, the Company would utilize best management practices in sensitive wetland and water resource areas and during dewatering activities to minimize impacts and disturbance. The Company would also provide an Environmental Monitor and an Eversource Construction Inspector to oversee and inspect construction activities and environmental controls. Accordingly, the Siting Board finds that the wetlands and water resource impacts resulting from the construction of the Project along the Primary Route would be minimized.

4. Noise Impacts

a. Primary Route

Construction of the Project overhead along the ROW would generate noise during all stages of construction (Exhs. EFSB-NO-5; EFSB-NO-7). The Company indicated, however, that noise impacts would be temporary (Exhs. EV-2, at 5-11; EFSB-NO-7). The Company explained that noise impacts at any specific point along the Project would increase to a maximum with the approach of construction, and become less pronounced as construction continued forward along the Project's linear pathway (Exh. EV-2, at 5-28). The Company anticipated that Project transmission line construction would typically progress at the rate of 2,640 feet (0.5 mile) in three days, or 880 feet per day (Exh. EFSB-G-14). The Company anticipated no blasting (Exh. EFSB-NO-8).

The route would pass through residential areas with residential buildings and individual residential units at distances from the Company's ROW as indicated in Table 4, below (Exhs. EFSB-LU-10(1); EFSB-LU-20(1); EFSB-MF-14(1)).

Table 4. Distance of Residential Buildings & Residential Units from the Company's ROW

Distance (in feet)	≤ 25	> 25 to ≤ 50	> 50 to ≤ 100	> 100 to ≤ 200	> 200 to ≤ 300
Buildings	65	48	112	233	200
Units	115	61	184	303	234

Source: Exhs. EFSB-LU-10(1); EFSB-LU-20(1); EFSB-MF-14(1); EFSB-MF-17(S1)(2).

The Company explained that noise levels of construction equipment associated with construction along the ROW would range from 80 dBA (for a soil compactor) to 95 dBA (for dump trucks and mowers) at 50 feet from construction equipment on the ROW, with a drop of six dBA for every doubling of distance (i.e., a drop of 6 dBA at 100 feet and a drop of 12 dBA at 200 feet) (Exh. EFSB-NO-5; RR-EFSB-41). The Company stated that, at some locations, installation of transmission wire for the Project might involve aerial construction techniques using helicopters rather than traditional wire pulling methods (Tr. 5, at 685, 717; RR-EFSB-46). The Company indicated that at 50 feet from construction, using helicopters for wire pulling would typically generate noise at the 85 dBA level (Exh. EFSB-NO-5). The Company also

indicated that, in the area of the Project, noise impacts of helicopter use on animals as well as humans would require consideration (Tr. 5, at 701-702). The Company anticipated that, subject to the Company's construction specifications, its contractor would be responsible for deciding how to string conductors as well as for notifying, and obtaining all necessary approvals from, municipalities and abutters (RR-EFSB-46, at 2).

The Company proposed working on the Project six days per week, Monday to Saturday, from 7:00 a.m. to 6:00 p.m. (Exh. EFSB-NO-2). The Company anticipated that work outside these hours would occur only to compensate for schedule delays or delays due to inclement weather, or to undertake construction tasks requiring equipment outages during off-peak hours (id.). The Company stated that it would prefer to maintain its proposed schedule to minimize the length of the overall construction process (Exh. EFSB-NO-15). The Company indicated that it did not expect work occurring outside regular work hours to involve increased staffing or noise levels (Exh. EFSB-NO-2). The Company stated it would review specific locations for proximity to residents and coordinate start and completion times of work activities to minimize construction-related noise impacts (Exh. EFSB-NO-15).

The Company stated that it would use a combination of mail, e-mail, telephone, and door-to-door outreach to notify "direct abutters," including residents, business owners, and municipal officials, including the police, of upcoming scheduled weekday, nighttime and/or weekend construction (Exh. EFSB-G-3). In addition, once it had finalized its construction schedule, the Company would again contact direct abutters and municipalities to address any concerns they might raise (id.). All notifications would occur as soon as practicable before construction (id.).[22] The Company indicated that members of the public would be able to reach the Company throughout the construction process by contacting its community relations specialist (Tr. 5, at 742-744). The Company has not yet developed a comprehensive community outreach plan (Exh. EFSB-G-3).

The Company provided noise ordinances for the seven communities where it anticipated siting its Project (Exh. EFSB-NO-4; RR-EFSB-39). The Company did not expect to violate local

[22] According to the Company, notification one to two weeks in advance of construction had proven sufficient on past projects (Exh. EFSB-G-3).

noise ordinances in Walpole, Stoughton, Sharon, or Holbrook (RR-EFSB-39). With respect to Randolph, however, the Company indicated that noise ordinances restrict when and where certain construction activities and levels of noise from construction may occur (id.).[23] The Company stated that it would comply with the weekday limitations provided in the bylaw, and opined that Saturday construction would not violate Randolph's noise bylaw, on the basis that the Company would not produce sound levels as the result of the alteration, erection or repair of any building, nor would it conduct excavation work in connection with the Project (id.). With respect to Canton, the Company stated that its proposed work schedule and activities would conform to Canton ordinances governing Monday through Friday construction, but would violate Canton's regulations with respect to Saturday construction (id.).[24] The Company indicated, however, that the Chief of Police may waive construction time limits upon application (id.). The Company stated that it would seek such a waiver to begin work at 7:00 a.m. on Saturdays and would abide by the noise ordinance restriction in the absence of a waiver (id.).

The Company stated that it had identified no elements of the Project that would require continuous construction, with associated continuous noise (Exh. EFSB-NO-3). The Company explained, however, that power delivery system conditions might necessitate completion of certain construction tasks on a round-the-clock basis (id.).

The Company stated that it would run only necessary equipment and use only construction equipment of the latest design to mitigate noise impacts of construction (Exh. EFSB-NO-7). The Company stated that should it receive complaints of excessive noise, the Company would immediately take steps to measure noise levels and address any exceedance of ordinance limits (Exh. EFSB-NO-15). The Company indicated that noise mitigation to address excessive noise might include installation of temporary noise barriers around the work zone in addition to the use of construction equipment of the latest design (id.; Exh. EFSB-NO-7).

---

23 The Randolph bylaws provide that "no one shall erect, alter, or repair any building or excavation except between the hours of 7 AM and 6 PM, on weekdays" (RR-EFSB-39).

24 The Company proposed construction on Saturdays from 7:00 a.m. to 6:00 p.m. (RR-EFSB-39). The Canton bylaw allows construction activities and use of construction equipment on Saturdays between the hours of 8:00 a.m. and 5:00 p.m. (id.).

The Company reported that the only continuous sound producing equipment to be added at the West Walpole Substation, Holbrook Substation, and Sharon Switching Station in conjunction with Project-related upgrades would be limited to air conditioning units within the control enclosure at each respective location; circuit breaker operation would generate short-duration, intermittent sound (Exhs. EFSB-NO-10; EFSB-NO-11).[25]

b. Noticed Alternative Route

The Company indicated that there would be 328 residential buildings within 300 feet of the ROW segment shared by the Primary Route and the Noticed Alternative Route from West Walpole to the Company's Canton Tap (Exhs. EFSB-MF-14; EFSB-MF-15). Along the remaining segment (overhead) of the Primary Route, there would be 330 residential buildings, compared to 722 residential buildings along the remaining segment (underground) of the Noticed Alternative Route (Exhs. EFSB-MF-14; EFSB-MF-15). The Company indicated that the Noticed Alternative Route passes by 1174 residential units versus 897 residential units along the total length of the Primary Route (Exh. EFSB-MF-17(S1); EFSB-MF-17(S1)(1); EFSB-MF-17(S1)(2)). The Company indicated that equipment noise levels for construction of both the overhead and underground portions of the Noticed Alternative Route would be comparable to noise from equipment use for construction of the Primary Route (Exh. EFSB-NO-5). The Company asserted that there would be a similar number of receptors in the vicinity of the Primary and Noticed Alternative Routes and that therefore, the two routes would be equal with respect to noise impacts of construction (Exhs. EV-2, at 5-28).

---

[25] With respect to design of the Project enabling the addition of future transformers or other potential noise sources at Walpole, West Walpole, and Holbrook Substations, the Company indicated that other construction for the Project would take place outside the fence line of these substations on Company-owned property and would neither enable nor preclude the addition of equipment in the future (Exh. EFSB-NO-12). The Company indicated that, as designed, the proposed Sharon Switching Station could accommodate two distribution transformers and associated distribution switchgear, but that no such addition was included as part of the Project (id.).

c. Positions of the Parties

Ms. Hyland indicated that construction noise for the Project would likely be greater than 70 dBA (Hyland Brief at Part 3). Ms. Hyland urged the Siting Board to consider this noise level in light of its exceedance of certain noise ordinances of the Town of Holbrook (RR-EFSB-99; RR-EFSB-41; Hyland Brief at Part 3). Ms. Munroe emphasized the need for notifying residents of impending noise impacts in conjunction with ROW maintenance (RR-EFSB-43; Tr. 5, at 644-646).

d. Analysis and Findings

The Company proposes construction of its Project with the same substations and switching station along either the Primary or Noticed Alternative Route. Noise impacts at these sites would therefore be comparable. Furthermore, the source and location of noise at these sites would limit noise impacts. With respect to noise impacts of construction along the linear portions of the Project, the progress of construction along the length of the Project would limit noise impacts at any one location. However, given the longer route, the underground construction, and the greater number of receptors in the vicinity of the Noticed Alternative Route, the Siting Board finds that the Primary Route is preferable to the Noticed Alternative Route with respect to noise impacts.

The Company proposed a construction schedule of 7:00 a.m. to 6:00 p.m., Monday through Saturday, with the exception of work that necessarily has a longer required continuous duration than normal construction hours allow, such as work associated with outage dependent activities. The Siting Board finds that, with the exception of Saturday construction, the Company's proposed construction hours are reasonable. The Siting Board directs the Company to limit construction of the Project to Monday through Friday, from 7:00 a.m. to 6:00 p.m., and from 9:00 a.m. to 5:00 p.m. on Saturdays. Because the ROW construction is in close proximity to many densely populated residential areas, Saturday construction is not allowed in areas with residential abutters within 100 feet of construction work areas or activities. Work that necessarily has a longer required continuous duration than normal construction hours allow (such as that associated with outage dependent work activities) shall be exempted from the above weekday and Saturday limitations.

Should the Company need to extend construction work beyond those hours and days (with the exception of emergency circumstances on a given day that necessitate extended hours), the Siting Board directs the Company to seek written permission from the relevant municipal authority before the commencement of such work, and to provide the Siting Board with a copy of such permission. If the Company and municipal officials are not able to agree on whether such extended construction hours should occur, the Company may request prior authorization from the Siting Board and shall provide the relevant municipality with a copy of any such request.

The Company shall inform the Siting Board and the relevant municipality in writing within 72 hours of any work that continues beyond the hours allowed by the Siting Board. The Company shall also send a copy to the Siting Board, within 72 hours of receipt, of any municipal authorization for an extension of work hours. Furthermore, the Company shall keep records of the dates, times, locations, and durations of all instances in which work continues beyond the hours allowed by the Siting Board, or, if granted extended work hours in writing by a municipality, work that continues past such allowed hours, and must submit such record to the Siting Board within 90 days of Project completion.

The Company has yet to develop specifics for its general Project outreach plan. Therefore, the Siting Board directs that the Company, in consultation with Walpole, Sharon, Canton, Stoughton, Avon, Randolph, and Holbrook, develop a detailed community outreach plan for Project construction. The outreach plan should list residents, businesses, and officials the Company would notify in each community and detail how notification of the listed residents, businesses, and officials would occur for each of the following: start, duration, and hours of typical construction; construction the Company intends to conduct that, due to unusual circumstances, must take place outside typical hours; web-based Project information; and complaint and response procedures that include the Company's contact information.

The Siting Board notes that the Company's promised adherence to Massachusetts anti-idling law and regulations would mitigate noise levels generated during construction of the Project as well as air emissions. See Section VI.C.6.a.i, below.

The Siting Board finds that, with the Company's implementation of the above conditions limiting construction hours near residential areas, and development of a community outreach

plan, noise impacts from the construction and operation of the Project along the Primary Route would be minimized.

5. Traffic

a. Primary Route

The Company stated that installation of the Project along the Primary Route would involve 42 road crossings, including three state highway crossings (id. at 5-22; EFSB-T-3). The Company anticipated that impacts at any given road crossing, including potential impacts to public safety, would last for the duration of construction at the road crossing site; the completion of road crossing construction would occur rapidly (id. at 5-11, 5-20).

The Company indicated that in preparation for street crossings, it submitted a Non-Vehicular Access Permit application to Massachusetts Department of Transportation ("MassDOT") as part of the Company's Temporary Traffic Control Plans ("TCP") (Exh. EFSB-T-3; Tr. 5, at 730-732; RR-EFSB-47; RR-EFSB-47(1)). The Company indicated that in conjunction with its Temporary TCP it would also seek MassDOT approval before the Company or its contractor engaged in stringing conductor above the highway (Exhs. EV-2, at 5-20; EFSB-T-3; RR-EFSB-46).

The Company indicated that the Company and its construction contractor would employ police details from towns to supervise traffic during equipment and materials delivery (Tr. 5, at 738). The Company anticipated using flaggers or police controlling traffic at work locations only when the construction at the site involved crossing a street, a highway, or railroad tracks (id. at 743). The Company stated it would secure approvals from each municipality in advance of any temporary road closures (Exh. EV-2, at 5-20).

With regard to the Sharon Switching Station, the Company stated that it would develop, and review with Sharon officials, a traffic management plan specific to the potential impacts of construction-related traffic to and from the Canton Street site (Exh. SHARON-7). The Company stated it would require its construction contractor to retain police details whenever construction activities might affect traffic flow along Canton Street, including for funeral procession traffic to two active cemeteries near the Sharon Switching Station (Exh. MFCA-1-18).

The Company indicated that where it needed access to its ROW corridor for construction, access would preferentially occur from several intersections of the Company's existing ROW and public roadways (Exh. EV-2, at 5-4). The Company stated, in addition, that it had existing access routes to its ROW that it would use for Project construction along the ROW corridor to the extent possible; the Company would otherwise develop temporary access routes (id.).

The Company explained that Project construction crew would park on Company-owned property, including substations, and at designated areas along the ROW (Exh. EFSB-T-2). At locations with limited parking (e.g., the Sharon Switching Station), the Company would use construction vehicles to shuttle crew from other Company property to the work site (id.). For work along the ROW, the Company would arrange for workers to park at pre-designated mobilization areas along Company-owned ROW property; entry and exit points to work areas would be along Company-owned property and/or easements (id.).

The Company anticipated that any arrangements for temporary equipment and/or worker parking would be on properties away from the ROW (Exh. Sandberg-8). The Company stated that if its construction contractor wanted to park at a location along the ROW, the Company would inform its contractor of Company-owned property that could be considered (id.). The Company stated that ROW properties subject only to Eversource easement rights would not be open to consideration for such parking uses (id.).

b. Noticed Alternative Route

The Company stated that the Primary and Noticed Alternative Routes would share 14 of the Primary Route's 42 road crossings (Exhs. EV-2, at 5-21 to 5-22). The Company indicated that the traffic impacts of the 28 crossings along the rest of the Primary Route would be minor relative to traffic disruption from underground construction of the remainder of the Noticed Alternative Route (id. at 5-22). The Company stated that it would construct the 12.5-mile underground portion of the Noticed Alternative Route within roadways (id.). The Company anticipated that attendant impacts to traffic would include lane closures, detours, and delay (id.).

c. Analysis and Findings

The Project would give rise to temporary, localized impacts due to transportation of workers, materials, and equipment for transmission line and substation construction. Construction along the Company's existing ROW would limit the greater part of traffic impacts along the Primary Route to road crossings. At road crossings, coordination with municipal and state highway authorities and the use of police details would mitigate impacts of construction. In addition, the Company stated it would put a system in place for notifying residents as construction neared their specific neighborhood and for members of the public to reach the Company throughout the Project construction process.

Unlike the Primary Route, construction of a 12.5-mile segment of the Noticed Alternative Route would be directly in roadways, with associated direct impacts to streets with residential and commercial development. Given the additional traffic impacts associated with in-roadway construction along the Noticed Alternative Route, and with the aforementioned outreach plan to address possible construction-related traffic impacts, the Siting Board finds that the Primary Route is preferable to the Noticed Alternative Route with respect to traffic impacts associated with construction of the Project.

The Company anticipates that all temporary equipment and/or worker parking would be on Company-owned property and/or substations and at ROW areas designated by the Company, excluding those ROW properties subject only to Eversource easement rights. To ensure that potential construction-related parking impacts are thus minimized, the Siting Board directs the Company to limit equipment and/or worker parking, including parking by any contractor on its Project, to Company-owned property, including substations, and to Company-designated areas along the ROW. The Siting Board further directs the Company, if its construction contractor has an interest in parking at a location along the ROW, to direct its contractors to use Company-owned property and areas along the ROW appropriate for this purpose; such properties shall not include ROW properties subject only to Eversource easement rights.

The Siting Board directs the Company to alert Project neighbors a minimum of two weeks in advance of anticipated local construction and traffic impacts, and to provide this information on a project webpage. The Siting Board also directs the Company to provide a Project-specific phone number, staffed during all daytime construction hours, for public calls and

concerns with respect to construction-related impacts; the Company should respond within 48 hours to calls received. Further the Company shall (a) keep a log of dates, times, and reasons for calls to its Project-specific phone line, and the Company's response to calls received, and (b) file a copy of its phone log with the Siting Board each month during Project construction.

With the implementation of the conditions imposed above, the Siting Board finds that traffic impacts from construction and operation of the Project along the Primary Route would be minimized.

6. Air

a. Primary and Noticed Alternative Routes

i. Air Impacts of Construction Equipment

The Company indicated that the Project using either the Primary or Noticed Alternative Route would result in a temporary increase in particulate emissions from construction vehicles (Exhs. EV-2, at 5-10). To mitigate these air impacts, the Company stated that it would comply with the Massachusetts Diesel Retrofit Program (id.; Exh. EFSB-A-8).[26] The Company also anticipated that disturbance to soils from using Project construction equipment and from other construction activities would temporarily increase dust and reduce air quality (id.). The Company stated that it would wet soil stockpiles as necessary and cover trucks transporting excavated soils (Exhs. EV-2, at 5-10; EFSB-A-6).

The Company has committed to using ultra-low sulfur diesel fuel in its diesel-powered construction equipment and limiting vehicle idling to five minutes in accordance with Massachusetts anti-idling law and regulations (Exhs. EFSB-A-7; EFSB-A-8).

---

[26] The Company stated it would direct its contractors to retrofit any diesel-powered, non-road construction equipment rated 50 horsepower or above, the engine of which is not certified to USEPA Tier 4 standards and is to be used for 30 days or more over the course of the Project, with USEPA-verified (or equivalent) emission control devices (e.g., oxidation catalysts or other comparable technologies) (Exhs. EV-2, at 5-6 to 5-7; EFSB-A-8).

ii. Air Impacts of SF_6

As currently designed, the Project would use approximately 2,400 pounds of sulfur hexafluoride ("SF_6") gas in new 115 kV circuit breakers, and in the GIS equipment at the proposed Sharon Switching Station for electrical insulation and arc interruption in circuit breakers (Exh. EFSB-A-5).[27] The Company stated that manufacturers would design and install new equipment for the Project to meet an annual emission rate of 0.1 percent, the lowest commercially available emission rate for the proposed new equipment (id.). The Company indicated that this emission rate would be in compliance with the Massachusetts standard of 1.0 percent per year under 310 CMR 7.72, and that additional spending would not result in further reduction of SF_6 emissions (id.).[28]

The Company stated that Mineral Oil Dielectric Fluid ("MODF") would be the only alternative to SF_6 gas for use in circuit breakers (id.). The Company indicated that gas-insulated circuit breakers and switchgear would be smaller, lighter, and easier to maintain than comparable

---

27 Page 103 of the Massachusetts Clean Energy and Climate Plan for 2020 identifies SF_6 as a non-toxic but highly potent greenhouse gas ("GHG") and estimates one pound to have the same global warming impact as eleven tons of carbon dioxide ("CO_2"). . Reducing SF_6 emissions is an important policy goal of the Clean Energy and Climate Plan. The Siting Board's mandate requires it to ensure the consistency of new energy facilities with the Commonwealth's current health, environmental protection, and resource and development policies. See Section VIII. In accordance with this mandate, the Siting Board reviews the Company's proposed use of SF_6 to ensure reduction of SF_6 emissions to the maximum extent possible. On August 11, 2017, MassDEP issued final regulations in accordance with the GWSA that updated regulations under 310 CMR 7.72 to include declining annual aggregate emission limits for SF_6 and other measures on GIS. Companies and municipalities that own, lease, operate or control GIS purchased after June 1, 2015 that contains SF_6 and is located in Massachusetts must comply with 310 CMR 7.72.

28 The Company reported its Massachusetts nameplate SF_6 capacity at approximately 101,217.4 pounds as of 2014 (Exh. EFSB-A-3). For the same year, the Company indicated an SF_6 leakage rate of approximately 0.82 percent for Eversource operations based on reported emissions of approximately 825 pounds; for its Year 2014 Western Massachusetts Electric Company operations, the Company indicated an SF_6 leakage rate of approximately 0.8 percent based on reported emissions (in combination with Connecticut Light and Power operations) of approximately 1,588 pounds (Exh. EFSB-A-2).

equipment insulated with MODF (id.). The Company explained that SF_6 had therefore generally replaced MODF for insulation of circuit breakers and switchgear (id.). The Company reported some investigational work being conducted on a gas mixture to replace SF_6; however, that, to the Company's knowledge, the replacement gas mixture was not yet commercially available in the voltage rating required for the Project (id.). The Company also indicated that air-insulated equipment at the proposed Sharon Switching Station would require an area approximately 21,500 square feet larger than the area required for gas-insulated equipment, with resulting impacts to approximately 24,000 square feet of 100-foot wetland buffer zone at the Canton Street location (Exh. EFSB-A-1).

The Company reported that Eversource personnel, trained by the equipment manufacturer, would fill new SF_6 equipment or would supervise personnel of the Company's contractor (Exh. EFSB-A-5). The Company further stated that it would not open gas-insulated equipment, filled at installation, until the need for maintenance, when the Company would use a specialized gas cart for SF_6 capture (id.). The Company stated that all equipment containing SF_6 would have an alarm to trigger attention in response to a low pressure event, an indication of a potential leak (Exh. EFSB-S-6).

The Company stated that it did not anticipate long-term storage of SF_6 at the Sharon Switching Station (Exh. EFSB-A-5). The Company also indicated that it would ship SF_6 in cylinders approved by the Department of Transportation (id.).

b. Analysis and Findings

Along either the Primary Route or the Noticed Alternative Route, the use of construction vehicles for the Project would temporarily increase particulate emissions and disturb soils such that Project construction would temporarily increase dust and reduce air quality. The Company would mitigate these air impacts by complying with the standard Siting Board diesel retrofit condition and the Massachusetts Diesel Retrofit Program, and by following Massachusetts anti-idling law and regulations that limit vehicle idling to five minutes. In addition, the Company would limit temporary air quality impacts of the Project with the use of dust suppression and control construction practices, including, but not limited to, wetting soil stockpiles as necessary and covering trucks transporting excavated soils.

The Siting Board notes that air impacts along the Primary Route and the Noticed Alternative Route would be comparable in nature, but that the greater length of the Noticed Alternative Route and the resulting longer duration of construction would produce greater construction equipment air impacts. The Siting Board therefore finds construction along the Primary Route preferable to the Noticed Alternative Route with respect to air impacts.

The Company would require SF_6 gas in new 115 kV circuit breakers and in GIS equipment at the proposed Sharon Switching Station. The Siting Board directs the Company to inform the Siting Board if it adds SF_6 to any equipment or replaces any equipment due to SF_6 loss at the Sharon Switching Station within five years of the completion and initial operation of the Project, after which time the Company will consult with the Siting Board to determine whether the Siting Board deems it appropriate to require continued reporting. So that the Siting Board can stay informed of Eversource's overall progress to reduce SF_6 emissions, the Board directs the Company to submit to the Siting Board a copy of its annual SF_6 reports it provided to MassDEP. Further, the Siting Board directs the Company to comply with 310 CMR 7.72.

With the proposed measures to minimize dust and air emissions from construction equipment and the Company's selection of low-leakage SF_6 containing equipment, as well as the conditions outlined above, the Siting Board finds that potential air impacts from construction and operation of the Project along the Primary Route would be minimized.

7. Potentially Hazardous Materials and Solid Waste Impacts

a. Primary and Noticed Alternative Routes

The Company indicated that construction of the Project might result in excavation of materials previously contaminated by hazardous substances and/or as a result of former land development practices in the vicinity of the Primary Route or the Noticed Alternative Route (Exh. EV-2, at 5-28). The Company reviewed MassDEP's on-line database of release sites for each route to determine the relative likelihood that the Company would encounter subsurface contamination in the process of Project construction (id.). The Company reported that its review of the MassDEP on-line release site database revealed 46 sites within 500 feet of the Primary Route; the database indicated 82 sites within 500 feet of the Noticed Alternative Route, 57 of which would be in-road where underground trenching would occur (id.). The Company stated

that no release sites would be in the vicinity of the proposed Sharon Switching Station whether the Company undertook Project construction along either the Primary or the Noticed Alternative Route (id.). The Company stated that if it encountered contaminated materials while constructing the Project, it would contract with a Licensed Site Professional to manage soils pursuant to the Utility Release Abatement Measure or the Release Abatement Measure provisions of the Massachusetts Contingency Plan ("MCP"), 310 CMR 40.00 (id. at 5-28 to 5-29).

The Company reported that substances used in construction that would have the potential for negative environmental impact if leaked or spilled would include gasoline and diesel fuel oil, hydraulic oil, lubricating grease, all used in the operation of construction equipment, and sulfuric acid used in batteries for the operation of substations and switching stations (Exh. EFSB-S-2). The Company stated that it would refuel construction and other vehicles with an attendant present and in a location outside wetlands and buffer zones, as feasible (Exh. EV-2, at 5-18). The Company indicated that it would store batteries containing sulfuric acid within closed buildings at the West Walpole and Holbrook Substations and/or the proposed Sharon Switching Station (id.).

The Company indicated that upon completion of construction, the Sharon Switching Station would include equipment using substances with potential for harmful impacts on the environment if released; specifically, the Sharon Switching Station would use MODF in the station service transformers and electrolytes containing sulfuric acid in batteries (Exh. EFSB-S-3). The Company indicated that the West Walpole and Holbrook Substations currently use these same substances and would continue to do so after Project-related upgrades (id.). The Company stated that substation upgrades would require no addition of substances with the potential to harm the environment if released at either the West Walpole or the Holbrook Substations (id.).

The Company submitted a copy of the Spill Notification and Response Plan used for all the Company's existing facilities at and along the Company's Project ROW (Exh. EFSB-S-1(1)). The Company also described the secondary containment structures it uses to limit the extent of MODF leaks (Exh. EFSB-S-6). The Company also provided a record of its experience with responding to leaks resulting from use and/or storage of potentially hazardous substances

associated with construction, maintenance, or operation of the Project (Exhs. EFSB-S-1(1); EFSB-S-4). The Company reported that it has a clean-up and closure record of 100 percent for all spills, with no clean-up lasting longer than one year, and the great majority (99 percent) resolved within two weeks of the spill event (Exh. EFSB-S-5).

b. Analysis and Findings

Based on the MassDEP on-line release site database, the Company indicated the possible location of as many as 46 and 82 subsurface contamination sites along the Primary and Noticed Alternative Routes, respectively. The Company would contract with a Licensed Site Professional for proper disposal under Massachusetts regulations (e.g., the Utility Release Abatement Measure and the Release Abatement Measure provisions of the Massachusetts Contingency Plan) of any contamination unearthed during Project construction. To limit hazardous materials impacts during construction, the Company would undertake refueling and relocation of potentially hazardous substances outside sensitive resource areas to the extent possible. The Company would, as it does now, store potentially hazardous equipment such as batteries containing sulfuric acid within closed buildings on its properties. The Company would include new facilities for the Project under the Spill Notification and Response Plan in place for the Company's existing facilities at and along the Company's Project ROW.

The Noticed Alternative Route has a longer underground in-road segment which would involve more excavation, and a greater number of subsurface contamination sites along its length. The Siting Board therefore finds construction along the Primary Route preferable to the Noticed Alternative Route with respect to impacts of hazardous materials and solid waste.

The Siting Board further finds that, with Massachusetts regulations regarding hazardous materials and solid waste disposal, and with the provisions of the Company's own Spill Notification and Response Plan, Project impacts from potentially hazardous materials and solid waste would be minimized along the Primary Route.

8. Safety

a. Primary and Noticed Alternative Routes

The Company stated that construction workers would be subject to all Company safety protocols, including safety meetings, pre-work briefings, insulation and isolation of electrical equipment, and sheeting of excavations (Exh. EFSB-G-16). These protocols, as well as police details, as required by the towns or MassDOT, would also apply to work in the public way (id.; Exh. Sandburg-1; Tr. 4, at 549; RR-EFSB-40; RR-EFSB-40(S1)).

The Company stated that it would prohibit public access to construction sites throughout Project construction; the Company would use signs to notify the public of restrictions and barriers to prevent entry to Project construction sites (Exh. EFSB-G-16). With respect to the proposed Sharon Switching Station in particular, the Company stated that it would use fencing to bar public access and the fencing would be unlocked only during construction work hours, at which time a Company or contractor representative would be on site (id.; Exh. Sandburg-4). The Company stated that after construction, the Company would, as a matter of standard practice, gate and double lock its ROW corridors at intersections with public roadways to block public vehicle access (Exh. EFSB-G-16). The Company indicated, however, that Company and public safety officials (e.g., fire and police officers) would have access to ROW corridors, with their equipment, on a 24-hours-a-day, seven-days-a-week basis (id.). According to the Company, Project elements, including transmission line and structures, would meet the requirements of Massachusetts rules regulating installation and maintenance of electric transmission lines, 220 CMR 125, and the National Electrical Safety Code (id.). The Company stated, in addition, that as Project construction progressed, the Company would address specific public safety concerns brought to its attention (id.).

b. Analysis and Findings

The Company has safety protocols for construction workers, for the public, and for work in the public way. The public would not have access to construction sites throughout Project construction. The Company and public safety officials (e.g., fire and police officers), however, with their equipment, would have access to ROW corridors on a round-the-clock basis. Project elements would meet all applicable Massachusetts regulations and the National Electrical Safety

Code. After construction, the Company would block public vehicle access along its ROW to the extent possible by gating and locking its ROW corridors at intersections with public roadways.

The Siting Board notes that measures detailed by the Company during and after Project construction would be consistent with public and worker safety. The Company's safety protocols would be the same along either the Primary or the Noticed Alternative Routes. The Company, in maintaining public safety along its ROW after the Project, would face essentially the same challenge that it currently manages given existing ROW use. The Siting Board therefore finds that safety impacts of constructing the Project along either the Primary or the Noticed Alternative Route would be comparable. Further, the Siting Board finds that potential safety impacts from the Project's construction along the Primary Route would be minimized.

9. Magnetic Fields

a. Primary and Noticed Alternative Routes

Magnetic fields ("MF") occur whenever current flows in a conductor; consequently, electrical current carried in the proposed transmission lines would create magnetic fields (Exh. EV-3, App. 5-3, at 3). Some epidemiological studies have suggested a statistical correlation between exposure to MF and childhood leukemia. Mystic-Woburn at 68; Salem Cables at 84; Sithe Mystic Development, LLC, 9 DOMSB 101; EFSB 98-8, at 88-89 (1999). As of 2007, however, the World Health Organization ("WHO") reported that "the evidence for a causal relationship [between childhood leukemia and exposure to MF] is limited." Mystic-Woburn at 68; Salem Cables at 83. Therefore, according to the WHO, "exposure limits based upon epidemiological evidence are not recommended, but some precautionary measures are warranted." Mystic-Woburn at 68; Salem Cables at 83. When reviewing MF in past proceedings, the Siting Board, in recognition of public concern about MF and in keeping with WHO guidance, has encouraged use of low cost measures that would minimize MF along transmission ROWs.

For the Project along the Primary Route, the Company modeled magnetic fields under existing and proposed conditions for six segments[29] of the ROW, divided at substations and tap lines (Exhs. EFSB-MF-12; EFSB-MF-12(S1)(1); RR-EFSB-33(1)). The Company first considered Project MF levels resulting from an "all on line" and "all off line" dispatch scenario for local power generators – Fore River in Weymouth, and Potter and Thomas Watson Generating Stations in Braintree (Exh. EV-3, App. 5-3, at 1). The Company evaluated both dispatch scenarios at annual average load ("AAL") (60 percent of peak) and at annual peak load ("APL") (id.).

The Company subsequently provided MF modeling under an intermediate dispatch scenario (Fore River Station on, and Potter and Thomas Watson Stations off), again at both AAL and APL (RR-EFSB-33). For all three system dispatch scenarios, the Company evaluated (1) pre-Project (2017) and post-Project (2022) AAL, and (2) pre-Project (2017) and post-Project (2022) APL, representing an annual upper limit of MF (id.; Exh. EV-3, App. 5-3, at 1). According to the Company, the intermediate dispatch scenario, modeled in combination with the AAL, would be most representative of future long-term conditions along its transmission ROW (RR-EFSB-34; RR-EFSB-35).

[29] The six route segments are: (1) West Walpole to Walpole; (2) Walpole to Norwood; (3) Norwood to Canton; (4) Canton to Stoughton; (5) Stoughton to South Randolph; and (6) South Randolph to Holbrook (Exh. EV-3, App. 5-3, at 8).

Table 5. Calculated Magnetic Field Levels (in milligauss) for Pre-Project & Post-Project, Intermediate Generation Dispatch Scenario at Average Annual Load (AAL)[(a)]

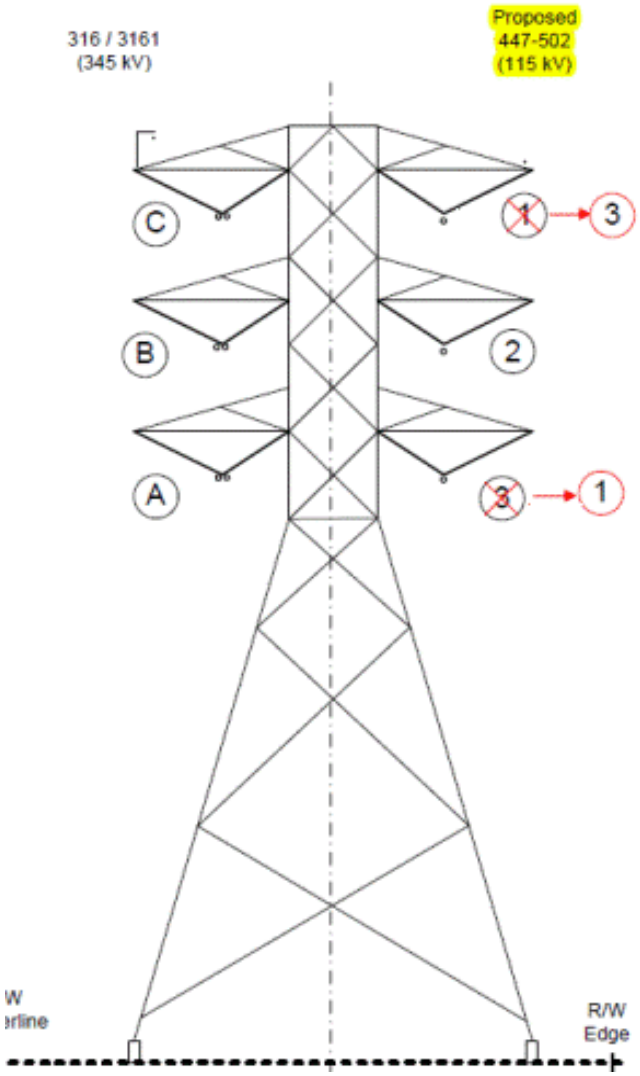
ROW Section [with # homes within 100' (N,S) of ROW]	Modeled Conditions Pre & Post Project	100' South of ROW	25' South of ROW	Southern Edge of ROW	Maximum Within ROW	Northern Edge of ROW	25' North of ROW	100' North of ROW
1 (15, 15)	Pre	0	1	2	40	4	2	1
	Post	1	3	4	39	13	7	3
2 (10, 1)	Pre	2	10	22	52	8	5	1
	Post	6	18	30	53	36	23	8
3 (4, 3)	Pre	2	12	26	61	7	4	1
	Post	7	23	38	60	43	28	10
4 (127, 75)	Pre	3	16	33	74	7	3	1
	Post	8	25	40	74	52	34	11
5 (26, 29)	Pre	3	15	32	75	9	5	1
	Post	5	15	27	49	29	18	6
6 (21, 34)	Pre	3	16	34	79	8	4	1
	Post	5	17	30	53	30	18	6

(a) Calculations assume conductor heights at points of maximum sag (Exh. EFSB-MF-18).
Sources: Exh. MF-17(S1)(1); RR-EFSB-33; RR-EFSB-33(1).

Table 5, above, shows the Company's comparison of MF levels along the six segments of the ROW for the intermediate dispatch condition under AAL. Under the intermediate dispatch shown in Table 5, AAL magnetic field levels would increase at all six segments along the edge of the ROW to the north (RR-EFSB-33(1)). The highest post-project AAL magnetic field levels with the intermediate dispatch at the edge of the ROW would be 52 milligauss ("mG") on the northern edge in Segment 4; the pre-project level at this location is 7 mG (RR-EFSB-33(1)). As shown in Table 5, the Project has a lesser effect on AAL MF levels with intermediate dispatch to the south of the ROW (RR-EFSB-33(1)). The Company indicated that the larger increases in MF levels on the north side of the ROW would be caused by placing the new 115 kV circuit closer to the north edge of the ROW than existing circuits (Exh. NSTAR-1, A2, App. 5-3, at 16). The Company highlighted a rapid drop of MF with lateral distance away from each edge of the ROW (Exh. EV-2, at 5-27 to 5-28).

The Company evaluated the potential of various phase arrangements for the six ROW segments to minimize cumulative MF exposures to the extent possible, with special attention to the proximity of residences (RR-EFSB-35). The Company described an adjusted alternate phasing which could be used in place of the Company's proposed phasing, which would involve reversing the top-to-bottom phase conductor arrangement of the proposed new 115 kV line (Line 447-502/510) to bottom-to-top order (RR-EFSB-35). Figure 2 illustrates the change in conductor sequence described by the Company in its explanation of adjusted/reverse phasing (Exh. EFSB-MF-21, at 5).

Fig. 2. Reverse Phasing, Line 447-502/510



The Company discussed potential mitigation of MF increases in residential areas along the Company's ROW with use of the adjusted phase arrangement in place of the Company's proposed conductor phasing (RR-EFSB-35). The Company identified Segment 4, from the Canton Tap to the Stoughton Switching Station, and Segment 5, from the Stoughton Switching Station to South Randolph Tap, as having nearly two-thirds of the residences (i.e., residential units) within 300 feet of the ROW edge, and over seventy percent of residences within 100 feet of the ROW edge (id.). Table 6, below, indicates the number and location of residences within 100 feet of the ROW along Segments 4 and 5.

Table 6. Residences within 100 feet of the ROW, Segments 4 and 5.

Distance (feet) from ROW edge / Segment	0 to ≤25	>25 to ≤50	>50 to ≤100
Segment 4 North Side	67	8	52
Segment 4 South Side	11	13	51
Segment 5 North Side	7	8	11
Segment 5 South Side	10	4	15

Sources: EFSB-MF-17(S-1)(1); RR-EFSB-35.

Table 7, below, provides post project calculated MF levels with reverse phasing for the Project along Primary Route Segments 4 and 5 at 12.5 feet (the midpoint between 0 and 25 feet) to the north and to the south of the ROW (id.). For Segment 5, the adjusted/reverse phase change would decrease MF on the south side, but increase MF on the north side of the ROW (id.). The Company noted that, in consequence, given a similar number of residences along Segment 5 to the north and to the south of the ROW, adjusted conductor phasing along Segment 5 would change the location of MF values rather than the number of residences affected; therefore, adjusted conductor phasing along Segment 5 is not recommended (id.).

Table 7. Post Project Calculated MF Levels (milligauss), Reverse Phasing, ROW Segments 4 and 5

Location-Phasing Post Project	MF at 12.5 Feet South of ROW	MF at 12.5 Feet North of ROW
ROW 4, Proposed Phasing	32	42
ROW 4, Reverse Phasing	**20**	**16**
ROW 5, Proposed Phasing	20	23
ROW 5, Reverse Phasing	**13**	**33**

Source: RR-EFSB-35.

The Company stated that along Segment 4, however, reverse phasing would decrease MF on both the north and south side of the ROW (id.). Therefore, for Segment 4, the Company's MF analysis suggests potential benefit from the use of reverse conductor phasing (id.). Compared to the proposed standard phasing arrangement, the reverse conductor phasing would lower overall exposure to power-frequency MF from the transmission circuits on the ROW, particularly on the north side of the ROW (id.).

The Company identified environmental and monetary costs of making the phasing of Segment 4 different from the phasing on the other side of Canton Tap (id.). The Company indicated that it would need to erect a three-pole transition structure at the Canton Tap in a wetland area to implement the phasing change (id.). Construction would require 5,625 square feet of swamp matting and the filling of approximately 125 square feet of wetland for pole footings (id.). The Company estimated that rotating the phases would cost an additional $250,000 (id.).

The Company also provided an assessment of MF values for the Project constructed underground in roadways between Sharon and Holbrook along the Noticed Alternative Route (Exhs. EV-2, 5-26 to 5-27; EV-3, App. 5-3, Report 2, at 1-2, 9). The assessment indicated a maximum MF value of 11.1 mG directly above the conductor centerline, with MF strength falling rapidly with distance to 0.5 mG at a distance of 20 feet to either side of the centerline (Exh. EV-3, App. 5-3, Report 2, at 1-2, 9).

The Company indicated that modeled MF for the Project, if (a) overhead along the Primary Route, (b) given the intermediate dispatch scenario and (c) under AAL conditions, would fall below 85 mG, a level the Company identified as the Siting Board's "benchmark" for evaluating MF (RR-EFSB-35; Company Brief at 107 n.48, 108). The Company contends that it has properly considered the trade-off between costs and further mitigation and that, based on its analysis, no alternate phasing arrangement is warranted (Company Brief at 109).

b. Positions of the Parties

Ms. Munroe asserts that the Company should consider reverse phasing for Segment 4. Ms. Munroe argues that filling wetlands to add a three-pole transition at Canton Tap would be incremental to the filling of wetlands already anticipated by the Company in conjunction with

new tower construction at the proposed Sharon Switching Station (Munroe Reply Brief at 5). Ms. Munroe further argues that the cost for a reduction in MF realized at Segment 4 to the north of the ROW, the south of the ROW, and within the ROW would be marginal given the Project total cost (id.).

c. Analysis and Findings

For the Primary and Noticed Alternative Routes along their shared segments, MF values would be comparable. From the Sharon Switching Station to the Holbrook Substation, the Noticed Alternative Route, underground, would have substantially lower MF values than the Primary Route, which the Company would construct overhead within its ROW. Overall, therefore, the Noticed Alternative Route would be preferable to the Primary Route with respect to magnetic field levels.

The record shows that MF would increase along certain segments of the Company's ROW and decrease along other segments given typical operation of the Project (i.e., with the intermediate dispatch scenario and AAL). Among ROW segments to be traversed by the Project, Segment 4 has the most residences within 100 feet of the ROW, followed by Segment 5. Further, Segment 4 has 78 residences within 25 feet (67 residences to the north, 11 residences to the south) and MF levels increase on both sides of the ROW. Specifically, levels on the northern edge of the ROW increase from 7 mG to 52 mG and MF levels on the southern edge of the ROW increase from 33 mG to 40 mG. Adjusted phasing would decrease MF on both the north and south side of the ROW, by approximately 26 mG and 12 mG, respectively, at 12.5 feet from the edge of the ROW. For Segment 5, adjusted phasing of the proposed transmission line would decrease MF on the south side, but increase MF on the north side of the ROW.

The record shows that implementing a phasing change of the Project along Segment 4 would require a three-pole transition structure in a wetland area at the Canton Tap. Construction would involve the use of 5,625 square feet of swamp matting to fill 125 square feet of wetland area for pole footings. The additional cost to the Project for construction of the three-pole transition structure would be $250,000.

In prior EFSB decisions, the Siting Board has recognized public concern about MF and has encouraged the use of practical, low-cost design to minimize MF along transmission ROW.

Mystic/Woburn at 70-71; Salem Cables at 88. The Siting Board requires MF mitigation which in its judgment is consistent with minimizing cost. GSRP at 87. In GSRP, the Siting Board found that support for consideration of mitigation measures beyond the Company's original proposal included the following factors: (1) MF levels resulting from the Project (as well as incremental increases) are high compared to past transmission cases; (2) the transmission corridor passes through thickly settled areas, with a large number of homes located in close proximity to the transmission line; and (3) selection of the Primary Route results in measurable increases in MF. GSRP at 87-88 (2010).

The factors listed above for GSRP are directly pertinent to Segment 4 with its higher MF levels comparable to past transmission cases, a significant incremental increase over existing MF levels with the Project, and a large number of homes in close proximity to the transmission line. Here, adjusted (reverse) phasing of one segment of the Project, Segment 4, would lower MF levels significantly (by 26 mG on the north side and 12 mG on the south side of the ROW) for the majority of homes between the ROW edge and 100 feet from the ROW.

The appearance of the transition structure would be consistent with the appearance of other structures at the Canton Tap, thus mitigating a potential increase to visual impacts. Impacts associated with use of swamp matting at the Canton Tap would be temporary. As with wetland fill impacts at Sharon Switching Station (see Section VI.C.3), mitigation for wetland loss at Canton Tap would be in the form of 2:1 scrub-shrub wetland replication for lost wetland, in a wetland area near the Canton Tap site.

The Company's planning grade cost estimate (+25 percent/-25 percent) for the Project is $34.6 million (see Section VI.D); the cost to the Project of alternate phasing for Segment 4, essentially the incremental cost of a three-pole transition structure, is $250,000. Thus, the cost of alternate phasing for Project Segment 4 would be less than one percent of total Project cost. Based on the above, the Siting Board concludes that alternate phasing for Segment 4 provides MF mitigation that is consistent with minimized cost of the Project. The Siting Board directs the Company to implement adjusted (reverse) phasing for Segment 4 (Canton to Stoughton) as described in the record. Further, to accommodate the three-pole transition structure in a wetland area, the Siting Board directs the Company to develop a wetland replication area in the Canton Tap vicinity at a 2:1 ratio.

Accordingly, given implementation of the mitigation measures and conditions discussed above, the Siting Board finds magnetic field levels would be minimized along the Primary Route.

10. Summary of Environmental Impacts

The Siting Board finds that the information provided by the Company regarding the Project's environmental impacts is substantially accurate and complete. In comparing the environmental impacts along the Primary and Noticed Alternative Routes, the Siting Board finds that the Primary Route would have lower land use and historic resources, noise, traffic, air, and hazardous materials and solid waste impacts than the Noticed Alternative Route due to its shorter length and overhead construction. In contrast, the Siting Board finds that the Noticed Alternative Route would have lower visual and magnetic field impacts due to its construction almost entirely in roadways from the Sharon Switching Station to the Project's eastward end at the Holbrook Substation. The Siting Board further finds that the two routes are comparable with respect to safety, and wetlands and water resource impacts. On balance, the Siting Board finds that the Primary Route is preferable to the Noticed Alternative Route with respect to environmental impacts.

D. Cost

The Company initially provided conceptual level cost estimates (+50%/-25%) for both the Primary and Noticed Alternative Routes (Exhs. EV-2, 4-21 to 4-22; EFSB-C-8). These conceptual cost estimates included, but were not limited to, overhead line work along both the Primary and Noticed Alternative Routes, and underground line work along the Noticed Alternative Route (EFSB-C-2). Estimates included construction of the Sharon Switching Station and work at the West Walpole and Holbrook Substations for both routes (id.). The Company's initial conceptual level cost estimate for the Primary Route was $30 million (Exh. EV-2, 5-29). The initial conceptual level cost estimate was $141 million for the Noticed Alternative Route (id. at EV-2, 4-21 to 4-22; Exh. EFSB-C-8).

The Company subsequently provided a planning grade cost estimate (+25%/-25%) of $34.6 million for the Project (RR-EFSB-18). The Company stated that it did not advance a

planning grade cost estimate for the Noticed Alternative Route because, according to the Company, updated cost estimates for alternatives generally would reflect cost increases similar to Project cost increases (id.). Furthermore, the Company reported, the relative cost differential between the Project and other route alternatives, including the Notice Alternative Route, was unchanged by the updated cost estimate for the Project; the estimated cost differential between the Project and the Noticed Alternative Route is substantial, approximately $106 million (id.; Exh. EV-2, 4-21). Accordingly, the Siting Board finds that the Primary Route is preferable to the Noticed Alternative Route with respect to cost.

E. Reliability

The Company evaluated the Primary and Noticed Alternative Routes for factors that might contribute to outages and/or the speed of fault location and circuit repair should an outage occur (Exh. EV-2, at 5-29 to 5-30). These factors included the length of circuits proposed for the Project, the exposure of circuits to weather and associated impacts, and circuit accessibility (id.). According to the Company, the Project installed along the Primary Route would require less construction time to complete and would afford easier access for fault location and circuit repair; however, partially undergrounding the Project would protect undergrounded circuits from exposure and thus reduce the frequency of outages along the Noticed Alternative Route (id.). The Company indicated, taking such factors into consideration, that the Project would operate reliably if constructed along either the Primary or Noticed Alternative Route (id.). Accordingly, the Siting Board finds that Project reliability is comparable for the Primary and the Noticed Alternative Routes.

F. Conclusion

The Siting Board finds that the Primary Route is preferable to the Noticed Alternative Route with respect to environmental impacts and cost, and that the two routes are comparable with respect to reliability. The Siting Board therefore finds that the Primary Route is superior to the Noticed Alternative Route with respect to a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Based on review of the record, the Siting Board finds that the Company provided sufficient information to allow the Siting Board to determine whether the Project has achieved a proper balance among cost, reliability, and environmental impacts. The Siting Board finds that, with the implementation of the specified conditions and mitigation presented above, and compliance with all local, state, and federal requirements, the environmental impacts of the Project along the Primary Route would be minimized. The Siting Board finds that the Project along the Primary Route would achieve an appropriate balance among conflicting environmental concerns as well as among environmental impacts, reliability, and cost.

VII. STOUGHTON SWITCHING STATION

A. Introduction

In 2005, the Siting Board issued the final decision ("Final Decision") in Stoughton/Boston. The Siting Board approved the construction of a new, 17.5-mile 345 kV underground transmission line and a new four-acre switching station on a 14-acre property at the intersection of Route 138 and York Street in the Town of Stoughton (the Stoughton Switching Station). Stoughton/Boston at 1, 94. The Stoughton Switching Station construction was completed in 2006 (Exh. EFSB-G-37). Here, the proposed Project would not include any modifications or construction within the fence line at the Stoughton Switching Station (Company Brief at 17). However, the Project would consist of three new overhead transmission line structures along the southern edge of the property to allow the new 115 kV transmission line to pass underneath the existing 345 kV overhead transmission line (Exh. EFSB-G-10).

At the Siting Board's public comment hearings for the Project on July 21 and 22, 2014, and December 16, 2015, commenters brought up concerns associated with the Stoughton/Boston proceeding and the construction of the Stoughton Switching Station in 2006. In particular, concerns included compliance with post-construction visual mitigation and landscaping, completion of the terms of the Host Community Agreement with Stoughton, compliance with the Stoughton Conservation Commission's Order of Conditions, vegetation management, and completion of the stormwater system.

The Company maintains that the Project does not involve work within the Stoughton Switching Station, and therefore, the Stoughton/Boston proceeding is not be relevant to the

current proceeding (Company Brief at 17). However, the Siting Board notes that the Stoughton Switching Station adjoins the location of the Project, and has elicited significant concerns from the community regarding prior Siting Board requirements that purportedly have not been fulfilled by the Company. The Siting Board possesses ample authority to impose conditions that mitigate environmental impacts on a company when approving a facility, as well as ensure the Company's compliance with such conditions. Therefore, this proceeding is an appropriate opportunity to review the closely related Stoughton Switching Station and the conditions imposed in Stoughton/Boston.[30] The Siting Board issued information requests to Eversource regarding compliance with the conditions in Stoughton/Boston relating to the landscaping of the Stoughton Switching Station, and questioned Company witnesses at the Siting Board's evidentiary hearings on June 23, 2016.[31] See Tr. 2.

B. Visual

Condition G of the Final Decision stated the following:

> To ensure that the visual impacts of the proposed transmission project are minimized, the Siting Board directs NSTAR to develop and implement detailed landscape plans to screen the proposed switching station from residential and roadway locations on all sides, and to consult with the Town of Stoughton regarding the plans. To screen locations to the south and southeast, NSTAR shall consider, in consultation with affected

---

30 G.L. c. 164, § 69H(4) states: "[t]he [B]oard shall have the opportunity to issue orders with respect to any matter over which it has jurisdiction. Any applicant who violates any such order shall be subject to a civil penalty not to exceed $1000 for each violation for each day that the violation persists; provided, however, that the maximum civil penalty shall not exceed $200,000 for any related series of violations.

31 The Siting Board's review of the Company's compliance with the Stoughton/Boston conditions is separate from the Company's Project in this case. However, the Siting Board reviews the Company's compliance here in light of the public comments received because the Project involves three new overhead transmission line structures along the southern edge of the Stoughton Switching Station. We note that the Company had notice that the compliance issues were to be reviewed in this proceeding based on the comments received at the public comment hearings and the subsequent staff information requests issued on the subject. The Company provided record evidence and briefs concerning the compliance issues. The Town of Stoughton is not a party to the current proceeding; it was an intervenor in the Stoughton/Boston proceeding.

> landowners and the Town of Stoughton, use of plantings or other mitigation in off-site as well as on-site areas. NSTAR shall, if agreeable to the affected landowners or appropriate Town officials, include as part of its landscape plans plantings or other mitigation in off-site residential or roadway locations. To ensure a mix of plantings that provides some immediate screening in all directions, NSTAR shall offer the Town and affected landowners larger plantings in lieu of several smaller plantings at selected locations with the area of vegetative screening planned in different directions from the site. NSTAR shall provide a copy of its final landscape plans to the Siting Board for its information.

Stoughton/Boston at 168.

Following up on concerns expressed at the proposed Project public hearings, the Siting Board requested the Company provide a narrative description of the Company's implementation of the on-site and off-site landscaping plans and any variations to the final landscaping plans (Exh. EFSB-G-27). The Company's landscape consultant conducted a site visit to the Stoughton Switching Station in April 2016 and prepared a report concerning the current visual conditions (the "Report") (Exh. EFSB-G-27(3)).

The Report indicated that the current on-site conditions do not match the landscaping plans submitted during the Stoughton/Boston proceeding or in compliance filings submitted following the issuance of the Final Decision (Exh. EFSB-G-27(3) at 3). An April 26, 2006 Stoughton/Boston compliance filing contained a landscaping plan dated February 28, 2006; however, as the Company now explained, the landscaping plan is inconsistent with current as-built conditions (Exh. EFSB-G-27(3) at 2-3, Tr. 2, at 232). Eversource noted that a June 9, 2006 compliance filing ("June 2006 letter") in Stoughton/Boston stated that the final landscaping actions were "based upon the actual in-field conditions and experience of the landscape architect," but did not contain a landscaping plan (Exh. EFSB-G-27(3) at 3). The Company concluded that the June 2006 letter is the most accurate description of the as-built conditions at the switching station (Exh. EFSB-G-27(3) at 3). The Company suggested that the number of trees listed in the February 2006 landscape plan remains close to the same number planted, however the location may have changed (Tr. 2, at 234). The Company stated that an as-built plan, completed by the landscape architect, would normally be requested by the

Company, but that such a document could not be located for the work completed at the Stoughton Switching Station (Tr. 2, at 222-223).

Condition G also required the Company to develop off-site visual mitigation in consultation with affected landowners. Stoughton/Boston at 168. Eversource stated that three residents requested off-site mitigation (Exhs. EFSB-G-27(3) at 4; EFSB-G-28(3); EFSB-G-35; Tr. 2, at 254). Eversource indicated that "no landscape plans depicting Eversource's proposed off-site VIM [visual impact mitigation] measures for residential abutters were available" when the Company performed its site visit in April 2016 (Exhs. EFSB-G-27(3) at 3; EFSB-G-35). Furthermore, the Company stated that it was not aware of any follow-up communication with landowners after off-site mitigation was completed (Tr. 2, at 254).

Lastly, Condition G required that the Company consult with the Town of Stoughton on the landscaping plans. Stoughton/Boston at 168. Eversource reported that "[t]he Company has no record of discussion with the Town of Stoughton concerning the implementation of the landscaping plan, although it is likely such discussions did occur" (Exh. EFSB-G-27). The June 2006 letter noted that the Company met with Stoughton in February 2006 to present a scale model of the switching station, including proposed vegetation and landscaping, and that the Town of Stoughton did not express any concerns with the design presented or propose any changes (Exh. EFSB-G-28(1) at 3).

The Company stated that it performed extensive landscaping at the Stoughton Switching Station, and that any discrepancies found as a result of the site visit could be due to tree death, differences in the description of tree-planting locations within the site, and the discretion of the arborist during planting (Tr. 2, at 222-238). The Company noted that it faced difficulty locating records related to the Stoughton/Boston proceeding, specifically citing change in Company personnel and the ten-year duration since the Stoughton/Boston proceeding (Tr. 2, at 232, 233).

C. Water

In response to information requests issued by Ms. Munroe, a resident of Stoughton, the Company summarized the work completed by Eversource associated with storm water drainage and runoff during the construction of the Stoughton/Boston Project (Exh. MUNROE-1-1(S-1)). The Company asserted that it constructed a storm water drainage system to control drainage and

sedimentation that was consistent with the description provided in Stoughton/Boston (Exhs. EFSB-G-18(1) at 2; MUNROE-1-1(S-1)). Specifically, Eversource stated that it constructed five drainage ponds, a retaining wall, and a new settling stream to control storm water runoff, discharge clean storm water, and minimize impacts of storm water on the flow of the intermittent stream site (Exh. MUNROE-1-1(S-1)). [32]

Furthermore, Eversource responded to concerns regarding flooding on the switching station property and the impact on a nearby intermittent stream (Red Wing Brook) (Exh. EFSB-G-18(1); Tr. 2, at 250-252). The Company stated that in 2009, in consultation with Stoughton, it agreed to investigate a "drainage issue" on the switching station property (Exh. EFSB-G-18(1) at 2). Eversource noted that under heavy rains, nearby drainage culverts reach capacity and overflow into the Stoughton Switching Station, then into Red Wing Brook (Exh. EFSB-G-18(1) at 2; Tr. 2, at 250-251). The Company noted that the drainage issue was not caused by the Company's project and was not a term of the Company's HCA with Stoughton, but that it designed and constructed an improved drainage system to address concerns in 2009 (Exh. EFSB-G-18(1) at 2). According to Eversource, the drainage issues have, therefore, been resolved (Exh. EFSB-G-18(1) at 2-3, 15-17; Tr. 2, at 250-252).

D. Analysis and Conclusion

The Siting Board issues final decisions with conditions to ensure that projects approved by the Siting Board minimize impacts on nearby residents and the environment. The Siting Board's expectation is that the Company will maintain detailed records of project information including communications and construction plans related to the Siting Board-approved projects. The Company pointed to the passage of time and the change in Company staffing since the

---

[32] One additional issue addressed by the Company is the status of the development of a traffic light at Route 128 and York Street. In the Host Community Agreement ("HCA") between Stoughton and the Company concerning the construction of the Stoughton/Boston project, the Company agreed to fund the installation of a traffic light near the Stoughton Switching Station (Exh. EFSB-G-36). The Siting Board notes that the HCA was between the Company and Stoughton, and is a private agreement between those two parties, and the Siting Board does not enforce the terms of the HCA. See Exelon West Medway at 6. The Company stated that it continues to be committed and willing to install the traffic light (Exh. EFSB-G-37).

approval of the Stoughton/Boston project. Given the long life span of transmission projects and the interrelated nature of the electric grid, actions or conditions in one case can become relevant in a future case. Further, if the route or ancillary components of a new project are proposed either in the same location or in the vicinity of an existing facility, the environmental impacts of the proposed project on the existing facility, and any other nearby land use, are evaluated as a matter of course. In this case, the Siting Board received public feedback regarding the existing facility, and analyzed these concerns with respect to the environmental impacts of the proposed Project, to determine if additional mitigation would be required. This is especially relevant here since Eversource is the petitioner for both projects, and residents asserted that the Company had not fulfilled its compliance obligations.

The Siting Board notes that it appears that the current landscaping adequately satisfies Condition G of Stoughton/Boston. However, the Siting Board finds it unacceptable for the final, as-built, landscaping plans for on-site and off-site mitigation, as required in Condition G, to be omitted from the record in Stoughton/Boston. The Company should have submitted the as-built plans following the completion of landscaping activities. Additionally, the Company is unable to locate records detailing installed off-site mitigation and follow-up communications for residential abutters. Further, it is the Siting Board's understanding that the Company did not consult with, or seek feedback from, the Town of Stoughton on the final, as-built, landscaping plan, and that the Company has no record of, or is unable to locate, materials related to discussions between it and Stoughton following the installation of landscaping.

The Siting Board directs the Company, in this and all future projects, to maintain detailed records of communication between the Company and residents, and the Company and the host community, especially in regards to compliance with Siting Board conditions. Furthermore, the Company shall submit the final as-built landscape plans for all on-site and off-site visual mitigation for this Project.

Finally, with regard to concerns expressed about stormwater runoff and drainage associated with construction of the Stoughton Switching Station and the proposed Project's effect on such issues, see Section VI.C.3, above.

VIII. CONSISTENCY WITH POLICIES OF THE COMMONWEALTH

A. Standard of Review

G.L. c. 164, § 69J requires the Siting Board to determine whether plans for construction of the applicant's new facilities are consistent with current health, environmental protection, and resource use and development policies as adopted by the Commonwealth.

B. Analysis and Findings

1. Health Policies

In Section 1 of the Electric Utility Restructuring Act of 1997, the Legislature declared that "electricity service is essential to the health and well-being of all residents of the Commonwealth…" and that "reliable electric service is of utmost importance to the safety, health, and welfare of the Commonwealth's citizens…" See St. 1997, c.11, §1(a),(h). In Section III.D. above, the Siting Board found that the Project is needed for reliability of electric service in Massachusetts.

In Section VI.C.6., the Siting Board requires the Company to use only retrofitted off-road construction equipment to limit emissions of particulate matter during Project construction. This condition is consistent with MassDEP's Diesel Retrofit Program designed to address health concerns related to diesel emissions. In Sections VI.C.9, VI.C.5, and VI.C.7 the Siting Board finds that the Project's magnetic field, traffic, hazardous materials, and air impacts have been minimized. Accordingly, subject to specified mitigation and the Siting Board's conditions set forth in Section XII, below, the Siting Board finds that the Company's plans for construction of the Project are consistent with current health policies of the Commonwealth.

2. Environmental Protection Policies

The Global Warming Solutions Act ("GWSA"), enacted in August 2008, is a comprehensive statutory framework to address climate change in Massachusetts. St. 2008, c. 298. The GWSA mandates that the Commonwealth reduce its GHG emissions by 10 to 25 percent below 1990 levels by 2020, and by at least 80 percent below 1990 levels by 2050. G. L. c. 21N, §3(b). The GWSA authorizes the establishment of legally binding limits on GHG emissions in the Commonwealth, and designates the Secretary of Energy and Environmental

Affairs and MassDEP as the entities primarily responsible for implementing the GWSA. G.L. c. 21N, §§ 2-5.

Pursuant to the GWSA, the Secretary issued the Massachusetts Clean Energy and Climate Plan for 2020 on December 29, 2010 (the "2020 CECP") and an update dated December 31, 2015 (the "2020 CECP Update"). In a determination accompanying the 2020 CECP, the Secretary set the 2020 state-wide GHG emissions limit at 25 percent below 1990 levels. On September 16, 2016, Governor Charles D. Baker issued Executive Order 569, titled "Establishing an Integrated Climate Change Strategy for the Commonwealth." Executive Order 569 included the directive that MassDEP issue regulations pursuant to Section 3(d), setting declining annual aggregate GHG emissions limits for sources or categories of sources that emit GHGs, in order to achieve the 2020 limit. See Executive Order 569, at 3; see also G.L. c. 21N, § 3(d). On August 11, 2017, MassDEP issued final regulations in accordance with the GWSA.

The GWSA obligates administrative agencies, such as the Siting Board to consider reasonably foreseeable climate change impacts and related effects when reviewing permit requests. The Company has shown that the improvement to the transmission system in the Walpole-Holbrook area would have no adverse climate change impacts (e.g., additional GHG emissions) and related effects (e.g., sea level rise) (Exh. EV-2, at 6-2). In addition, the Siting Board has found in Section VI.C.6, above that, as specified by the Company, and with additional conditions imposed in this Decision, SF_6 emissions would be minimized.

In Section VI.C, above, the Siting Board reviewed how the Project would meet other state environmental protection requirements. The Siting Board also: (1) considered the Project's environmental impacts, including those related to land use, wetlands and waterways, traffic, noise, air emissions, visual impacts, and soil management; and (2) concluded that, subject to the specified mitigation and conditions set forth below, the Project's environmental impacts have been minimized.

The Project does not trigger enhanced public participation or enhanced analysis of impacts and mitigation under the "Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs" issued on January 31, 2017. Nevertheless, the Presiding Officer directed the Company to send by first class mail the Public Hearing Notice and summary page in English, Spanish, and Portuguese to the property owners abutting the proposed ROW for

the Primary Route and the Noticed Alternative Route, and to abutters-to-abutters within 300 feet of the ROW.

Subject to the specified mitigation and conditions set forth in this Decision, the Siting Board finds that the Company's plans for construction of the Project are consistent with the current environmental protection policies of the Commonwealth.

3. Resource Use and Development Policies

In 2007, pursuant to the Commonwealth's Smart Growth/Smart Energy policy, EEA established Sustainable Development Principles. Among the principles are: (1) supporting the revitalization of city centers and neighborhoods by promoting development that is compact, conserves land, protects historic resources and integrates uses; (2) encouraging reuse of existing sites, structures and infrastructure; and (3) protecting environmentally sensitive lands, natural resources, critical habitats, wetlands and water resources and cultural and historic landscapes. In Section V, the Siting Board reviewed the process by which the Company selected the route for the Project. The Project has been designed and conditioned to avoid or minimize impacts to natural and cultural resources by being placed in existing corridors linking existing substations.

Subject to the specific mitigation and the conditions set forth in this Decision, the Siting Board finds that the Company's plans for construction of the Project are consistent with the current resource use and development policies of the Commonwealth.

IX. ANALYSIS UNDER G.L. C. 40A, § 3 - ZONING EXEMPTIONS

Pursuant to G.L. c. 40A, § 3, the Company filed a petition seeking individual and comprehensive zoning exemptions from the Town of Sharon Zoning Bylaw in connection with the Company's proposal to construct a switching station in Sharon. The Company also sought both individual and comprehensive zoning exemptions from the Town of Holbrook Zoning Bylaw and the Town of Walpole Zoning Bylaw in connection with modifications and improvements to the Holbrook and West Walpole Substations (Exh. EV-6, at 1-2).[33]

[33] Individual zoning exemptions excuse the Company from compliance with only those specific provisions of the zoning bylaw that are identified in the petition. A comprehensive zoning exemption excuses the Company from compliance with all

A. Standard of Review

G.L. c. 40A, § 3 provides, in relevant part, that:

> Land or structures used, or to be used by a public service corporation may be exempted in particular respects from the operation of a zoning ordinance or by-law if, upon petition of the corporation, the [Department] shall, after notice given pursuant to section eleven and public hearing in the town or city, determine the exemptions required and find that the present or proposed use of the land or structure is reasonably necessary for the convenience or welfare of the public . . .

Thus, a petitioner seeking exemption from a local zoning bylaw under G.L. c. 40A, § 3 must meet three criteria. First, the petitioner must qualify as a public service corporation. Second, the petitioner must demonstrate that its present or proposed use of the land or structure is reasonably necessary for the public convenience or welfare. Finally, the petitioner must establish that it requires exemption from the zoning ordinance or bylaw. NRG Canal 3 Development LLC, EFSB 15-06/D.P.U. 15-180, at 140-141 (2017) ("NRG"). NSTAR Electric Company d/b/a Eversource Energy, EFSB 15-03/D.P.U. 15-64/15-65, at 77 (2017) ("Mystic/Woburn"); Save the Bay, Inc. v. Department of Public Utilities, 366 Mass. 667 (1975) ("Save the Bay").

Additionally, the Siting Board favors the resolution of local issues on a local level whenever possible, to reduce concern regarding any intrusion on home rule. The Siting Board believes that the most effective approach for doing so is for a petitioner to consult with local officials regarding its project before seeking zoning exemptions pursuant to G.L. c. 40A, § 3. NRG at 141; Mystic/Woburn at 77; Russell Biomass LLC/Western Massachusetts Electric Company, EFSB 07-4/D.P.U. 07-35/ 07-36, at 61-62 (2009) ("Russell Biomass/WMECo"). Thus, the Siting Board encourages petitioners to consult with local officials, and in some circumstances, to apply for local zoning permits, before seeking zoning exemptions from the

---

applicable zoning bylaws as they may apply to a specific project, as it is approved and conditioned by the Siting Board.

Department under G.L. c. 40A, § 3. NRG at 141; Mystic/Woburn at 77; Russell Biomass/WMECo at 68.[34]

B. Public Service Corporation

1. Standard of Review

In determining whether a petitioner qualifies as a "public service corporation" ("PSC") for the purposes of G.L. c. 40A, § 3, the Massachusetts Supreme Judicial Court has stated:

> among the pertinent considerations are whether the corporation is organized pursuant to an appropriate franchise from the State to provide for a necessity or convenience to the general public which could not be furnished through the ordinary channels of private business; whether the corporation is subject to the requisite degree of governmental control and regulation; and the nature of the public benefit to be derived from the service provided.

Save the Bay, 366 Mass. at 680; NRG at 142; Mystic/Woburn at 78; Berkshire Power Development, Inc., D.P.U. 96-104, at 26-36 (1997) ("Berkshire Power").[35]

---

[34] G.L. c. 40A, § 3 authorizes the Department, not the Siting Board, to grant zoning exemptions. On May 20, 2014, the Chair of the Department referred the Company's zoning exemption petition to the Siting Board for review and decision pursuant to G.L. c. 25, § 4. In accordance with G.L. c. 164, § 69H, the Siting Board applies Department and Siting Board standards "in a consistent manner." Thus the Department and the Siting Board implement G.L. c. 40A, § 3, using consistent standards of review. Consequently, the standard of review, and this Decision, cites to both Siting Board Decisions and Department Orders interpreting G.L. c. 40A, § 3.

[35] The Department interprets this list not as a test, but rather, as guidance to ensure that the intent of G.L. c. 40A, § 3, will be realized: i.e., that a present or proposed use of land or structure that is determined by the Department to be "reasonably necessary for the convenience or welfare of the public" not be foreclosed due to local opposition. Berkshire Power at 30; Save the Bay, 366 Mass. at 685-686; Town of Truro v. Department of Public Utilities, 365 Mass. 407, at 410 (1974) ("Town of Truro"); Exelon West Medway at 135 n. 117; MVRP at 5-6. The Department has interpreted the "pertinent considerations" as a "flexible set of criteria which allow the Department to respond to changes in the environment in which the industries it regulates operate and still provide for the public welfare." Berkshire Power at 30; MVRP at 6; see also Dispatch Communications of New England d/b/a Nextel Communications, Inc., D.P.U./D.T.E. 95-59B/95-80/95-112/96-113, at 6 (1998). The Department has determined that it is not necessary for a petitioner to demonstrate the existence of

2. Analysis and Conclusion

The Company is an electric company as defined by G.L. c. 164, § 1 and, as such, qualifies as a public service corporation. Mystic/Woburn at 78. Accordingly, the Siting Board finds that the Company is a public service corporation for the purposes of G.L. c. 40A, § 3.

C. Public Convenience or Welfare

1. Standard of Review

In determining whether the present or proposed use is reasonably necessary for the public convenience or welfare, the Department must balance the interests of the general public against the local interest. Save the Bay at 680; Town of Truro at 407. Specifically, the Department is empowered and required to undertake "a broad and balanced consideration of all aspects of the general public interest and welfare and not merely [make an] examination of the local and individual interests which might be affected." New York Central Railroad v. Department of Public Utilities, 347 Mass. 586, 592 (1964) ("NY Central Railroad"). When reviewing a petition for a zoning exemption under G.L. c. 40A, § 3, the Department is empowered and required to consider the public effects of the requested exemption in the State as a whole and upon the territory served by the applicant. Save the Bay at 685; NY Central Railroad at 592.

Therefore, when making a determination as to whether a petitioner's present or proposed use is reasonably necessary for the public convenience or welfare, the Department examines: (1) the need for, or public benefits of, the present or proposed use; (2) the present or proposed use and any alternatives or alternative sites identified;[36] and (3) the environmental impacts or any

---

"an appropriate franchise" in order to establish PSC status. Berkshire Power at 31; MVRP at 6; Eversource Hopkinton at 4-5.

[36] With respect to the particular site chosen by a petitioner, G.L. c. 40A, § 3 does not require the petitioner to demonstrate that its primary site is the best possible alternative, nor does the statute require the Department to consider and reject every possible alternative site presented. Rather, the availability of alternative sites, the efforts necessary to secure them, and the relative advantages and disadvantages of those sites are matters of fact bearing solely upon the main issue of whether the primary site is reasonably necessary for the convenience or welfare of the public. Martarano v. Department of Public Utilities, 401 Mass. 257, 265 (1987); NY Central Railroad at 591.

other impacts of the present or proposed use. The Department then balances the interests of the general public against the local interest and determines whether the present or proposed use of the land or structures is reasonably necessary for the convenience or welfare of the public. NRG at 143-144; Mystic/Woburn at 79; Tennessee Gas Company, D.T.E. 98-33, at 4-5 (1998).

2. Analysis

With respect to the need for, or public benefits of, the Project, the Siting Board found in Section III.D that additional energy resources are needed for reliability in the area of the Project. In Section IV.D the Siting Board analyzed a number of different project approaches other than the Company's proposed 115 kV transmission line that the Company might use to meet the reliability need (such as the use of NTAs) and concluded that the proposed approach is superior to other approaches. The Siting Board also reviewed the Company's route selection process in Section V, and determined that the Company applied a reasonable set of criteria for identifying and evaluating routes to ensure that no clearly superior route was missed. The Siting Board also compared the benefits of the Primary and Noticed Alternative Routes and concluded that the Primary Route is superior to the Noticed Alternative Route in providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Finally, regarding Project impacts, in Section VI.C the Siting Board reviewed the environmental impacts of the Project and found that, while the Project may result in some local adverse impacts, the environmental impacts of the proposed Project would be minimized with the implementation of certain mitigation and conditions. Based on the foregoing, the Siting Board finds that the general public interest in constructing the Project outweighs identifiable adverse local impacts. Accordingly, the Siting Board finds that the proposed Project is reasonably necessary for the convenience or welfare of the public.

D. Individual Exemptions Required

1. Standard of Review

In determining whether an exemption from a particular provision of a zoning by-law is "required" for purposes of G.L. c. 40A, § 3, the Department determines whether the exemption is necessary to allow construction or operation of the petitioner's project. NRG at 144-145;

Mystic/Woburn at 80-81; Tennessee Gas Company, D.P.U. 92-261, at 20-21 (1993). The Petitioner bears the burden to identify the individual zoning provisions applicable to the Project and then to establish on the record that exemption from each of those provisions is required:

> The Company is both in a better position to identify its needs, and has the responsibility to fully plead its own case . . . The Department fully expects that, henceforth, all public service corporations seeking exemptions under [G.L.] c. 40A, § 3 will identify fully and in a timely manner all exemptions that are necessary for the corporation to proceed with its proposed activities, so that the Department is provided ample opportunity to investigate the need for the required exemptions.

New York Cellular Geographic Service Area, Inc., D.P.U. 94-44, at 18 (1995); NRG at 145; Mystic/Woburn at 80-81.

2. Exemptions Sought

Tables 8, 9, and 10 below, summarizes: (1) each of the specific provisions of the Walpole, Sharon, and Holbrook Zoning Bylaws from which the Company seeks exemptions; (2) the relief available (if any) from the Walpole, Sharon, and Holbrook Zoning Bylaws; and (3) the Company's argument as to why it cannot comply with the identified zoning provisions and/or why the available zoning relief is inadequate.

Table 8. Requested Individual Exemptions from the Walpole Zoning Bylaw -- Summary of Company's Position

Section of the Zoning Bylaw	Available Relief	Why Exemption is Required: Company's Position
Activities Requiring a Special Permit Section 5-D.4.B	Special Permit	Excavation greater than 150 cubic yards in connection with the new control structure requires a special permit.
Site Plan Review Section 13-2.A	Special Permit	Construction of the new control structure requires a review of the site plan.

Source: Exh. EV-6, at 20.

Table 9. Requested Individual Exemptions from the Sharon Zoning Bylaw -- Summary of Company's Position

Section of the Zoning Bylaw	Available Relief	Why Exemption is Required: Company's Position
District Use Regulations Section 2310	None Available	The Switching Station use is not permitted in the Rural 1 District and the Zoning Board of Appeals is not authorized to issue use variances.
Prohibited Uses, Special Permits Sections 4521, 4532 and 4543	Special Permit	The Switching Station is located in the Water Resource Protection District and the use does not appear to be allowed.
Water Resource Protection District Section 4500	None Available	If the Switching Station use is not allowed by Special Permit in the Water Resource Protection District, a use variance would be required. However, the Zoning Board of Appeals is not authorized to issue use variances.
Building Location Section 2424	Dimensional Variance	The control enclosure is partially within the front yard setback and thus, a dimensional variance is required.
Driveways Section 2415	Variance/Waiver/ Service Disclaimer	All driveways must be constructed to provide access for emergency vehicles as determined by the Town Engineer and Fire Chief and grades greater than 10 percent must be approved by the Fire Chief. The Company will ensure that access is adequate for Class B vehicles. Further requirements by the Fire Chief or the Town Engineer are unknown.
Off-Street Parking and Loading Section 3100	Variance	Parking and loading requirements are not provided in the Zoning Bylaw for the Switching Station use. The Switching Station will be unmanned and, therefore, the Company is not proposing to provide parking spaces. A variance would be required for any parking and loading requirements that could be imposed on the site.
Sign Regs Section 3200	Variance	Variances would be required for the necessary number and dimensions of danger signs that the Company proposes to post at the Switching Station.
Wetland Setback Section 3320	Variance	Work at the Switching Station site will occur within a wetland setback.

Section of the Zoning Bylaw	Available Relief	Why Exemption is Required: Company's Position
Sedimentation and Erosion Section 3350	Variance	The construction of the Switching Station and driveway access will likely disturb more than 20,000 square feet of land, thus requiring plans that are duplicative of those required by the Sharon Conservation Commission.
Flood Hazard District Section 4400	Variance	A portion of the site, but not the proposed Switching Station itself, is located within the Flood Hazard District.

Source: Exh. EV-6, at 27-28.

Table 10. Requested Individual Exemptions from the Holbrook Zoning Bylaw -- Summary of Company's Position

Section of the Zoning Bylaw	Available Relief	Why Exemption is Required: Company's Position
Flood Plain Protection District Section 6	Special Permit	The Holbrook Substation is located in the Floodplain Protection District and certain uses are allowed only by special permit.
Flood Plain Protection District Section 6	None Available	If the substation site is not determined to be suitable for issuance of a special permit in the Floodplain Protection District, no local zoning relief would be available.
Signs Section 8	Variance	Variances would be required for the necessary number and dimensions of danger signs that the Company proposes to post on the new fenced area.
Land Space Requirements Section 9.4	Variance	The proposed control house would be the second such building on the lot, and, therefore, a variance would be required.

Source: Exh. EV-6, at 31-32.

3. Consultation with the Municipality

The Company stated that it engaged in extensive outreach to residents, businesses, local officials, and other stakeholders as part of its planning and development process for the Project (Exhs. HOLB-G-2; SHARON-1). The Company reports that it conducted a regional open house in Sharon to apprise local residents, business owners, municipal officials, and other interested

stakeholders of its plans and to learn of any concerns they may have about the Project (Exhs. HOLB-G-2; SHARON-1). The Company stated that it had many conversations with numerous officials of Holbrook, Walpole, and Sharon concerning the Project and the Company's petition to seek individual and comprehensive zoning exemptions (Exhs. EV-2, at 1-6R2; EFSB-G-18; EFSB-Z-2(S-1); EFSB-Z-2(S-1); EFSB-Z-3(S-1); EFSB-Z-11; EFSB-Z-14). The Company did not submit letters of support from Walpole, Sharon, or Holbrook for the Company's requested zoning exemptions; however, the Company states that none of the three municipalities objected to the Company's request for individual and comprehensive zoning exemptions (Company Brief at 123).

4. Analysis and Findings

The Company has identified in Tables 8 through 10, the provisions of the bylaws from which it seeks exemptions to minimize delay in the construction and ultimate operation of the Project. Based on this information, the Company would need to seek numerous variances and special permits. The Siting Board concurs with the Company that variances are difficult to obtain, constitute a disfavored form of relief, and are susceptible to being overturned on appeal. Consequently, the need to obtain variances is likely to result in an adverse outcome, a burdensome requirement, or an unnecessary delay. Further, the Board of Appeals of Sharon and Holbrook lack the authority to grant use variances for the Project.

The Siting Board also concurs with the Company that the potentially discretionary and substantive nature of conditions associated with granting of special permits may result in restrictive or burdensome conditions. Accordingly, the Siting Board finds that the substantive sections of the Walpole, Sharon, and Holbrook Zoning Bylaws, included in Tables 8 through 10 above, could affect the Company's ability to construct the Project as proposed. The Siting Board finds that Eversource has demonstrated that the requested zoning exemptions are required pursuant to G.L. c. 40A, § 3.

5. Conclusion on Request for Individual Zoning Exemptions

As described above, the Siting Board finds that: (1) the Company is a public service corporation; (2) the proposed use is reasonably necessary for the public convenience or welfare;

and (3) the specifically named zoning exemptions set forth in Tables 8 through 10 are required for construction of the Project, within the meaning of G.L. c. 40A, § 3. Additionally, we find that the Company engaged in good faith consultation with Walpole, Sharon, and Holbrook. Accordingly, the Siting Board grants the Company's request for the individual zoning exemptions listed above in Tables 8 through 10.

E. Comprehensive Zoning Exemptions

1. Standard of Review

The Company has requested a comprehensive exemption from the requirements of the Walpole, Sharon, and Holbrook Zoning Bylaws (Exh. EV-6, at 32-35). The Siting Board grants such requests on a case-by-case basis where the applicant demonstrates that issuance of a comprehensive exemption could avoid substantial public harm by serving to prevent a delay in the construction and operation of the proposed use. NRG at 153-154; MVRP at 63; Princeton Municipal Light Department, D.T.E./D.P.U. 06-11 (2007).

In order to make a determination regarding substantial public harm, the Department and the Siting Board have articulated relevant factors, including, but not limited to, whether: (1) the project is time sensitive; (2) the project involves multiple municipalities that could have conflicting zoning provisions that might hinder the uniform development of a large project spanning these communities; (3) the proponent of the project has actively engaged the communities and responsible officials to discuss the applicability of local zoning provisions to the project and any local concerns; and (4) the affected communities do not oppose the issuance of the comprehensive exemption. NRG at 154; Hampden County at 89; GSRP at 136-137.

1. Company Position

The Company offered two reasons why a comprehensive zoning exemption is necessary. First, the Company maintains that a comprehensive zoning exemption is necessary because zoning bylaws and ordinances are rarely written with unique energy infrastructure facilities in mind (Exh. EV-6, at 33). According to the Company, the lack of clearly defined and specific regulation of electric infrastructure in zoning codes, and the vague and subjective terms and provisions, result in an imprecise application of the zoning ordinances to the Project (id.).

Second, the Company contends that the grant of a comprehensive exemption would "remove any reasonable doubt" as to the ability of the Project to move forward without violating any terms of the zoning bylaws (Company Brief at 134). In addition, the Company argues that a comprehensive zoning exemption would exempt the Project from any future enactment that comes into effect that has the potential to jeopardize the Project (id.).

2. Analysis and Findings

As discussed in Section III.D, above, the Project is needed to maintain reliability for the regional transmission grid. Department and Siting Board cases that have considered and granted comprehensive exemptions have often involved projects that were time sensitive and that dealt with the zoning ordinances of multiple municipalities, where conflicting interpretations could arise. NRG, at 153-154; MVRP at 65; New England Power Company d/b/a National Grid, D.P.U. 13-187/188, at 58 (2015).

Even when a comprehensive zoning exemption is granted, however, one class of zoning ordinances or bylaws is often excluded: zoning restrictions relating to environmental aspects of the ongoing operation of the proposed project. Woburn Substation at 36; NSTAR Hopkinton at 45; Stoughton/Boston at 153-154. In this case, sections 3300, 3310, 3311, and 3312 (environmental controls) of the Sharon Zoning Bylaw set forth the Town's authority to limit nuisance type activity, prohibiting "[i]njurious, noxious or offensive" activity "to a neighborhood by reason of noise, smoke, odor, gas, dust, vibration or similar objectionable feature…". Sharon Zoning Bylaw at section 3311.

Consequently, were the Siting Board to include Sharon Zoning Bylaw sections 3300, 3310, 3311, and 3312 in the grant of a comprehensive exemption, the town could not exercise control over the on-going operations of the Project with respect to these important environmental impacts. Therefore, a comprehensive exemption is granted from these provisions as they relate to the construction of the Project only.

In addition, the Company has engaged in good faith consultations with numerous municipal officials regarding the Project, and none of the affected municipalities have objected to the grant of the comprehensive zoning exemption. The Siting Board finds that completion of the Project is time sensitive and its delay may result in substantial public harm because of the

non-compliance with existing reliability criteria applicable to the transmission system in the region.

Accordingly, we grant a comprehensive zoning exemption, with the exception of sections 3300, 3310, 3311, and 3312 of the Sharon Zoning Bylaw. The comprehensive exemption shall apply to the construction and operation of the Project as described herein, to the extent applicable. See Planning Bd. of Braintree v. Department of Public Utilities, 420 Mass. 22, at 29 (1995).

X. ANALYSIS UNDER G.L. C. 164, § 72

A. Standard of Review

General Laws, c. 164, § 72 requires, in relevant part, that an electric company seeking approval to construct a transmission line must file with the Department a petition for:

> authority to construct and use … a line for the transmission of electricity for distribution in some definite area or for supplying electricity to itself or to another electric Company or to a municipal lighting plant for distribution and sale … and shall represent that such line will or does serve the public convenience and is consistent with the public interest .... The [D]epartment, after notice and a public hearing in one or more of the towns affected, may determine that said line is necessary for the purpose alleged, and will serve the public convenience and is consistent with the public interest.[37]

The Department, in making a determination under G.L. c. 164, § 72, considers all aspects of the public interest. Boston Edison Company v. Town of Sudbury, 356 Mass. 406, 419 (1969). Among other things, Section 72 permits the Department to prescribe reasonable conditions for the protection of the public safety. Id. at 419-420.

In evaluating petitions filed under G.L. c. 164, § 72, the Department examines: (1) the need for, or public benefits of, the present or proposed use; (2) the environmental impacts or any other impacts of the present or proposed use; and (3) the present or proposed use and any

---

[37] Pursuant to G.L. c. 164, § 72, the electric company must file with its petition a general description of the transmission line, a map or plan showing its general location, an estimate showing in reasonable detail the cost of the line, and such additional maps and information as the Department requires.

alternatives identified. New England Power Company d/b/a National Grid, D.P.U. 12-2, at 37-38 (2012); NSTAR Electric Company/New England Power Company d/b/a National Grid, D.P.U. 11-51, at 6 (2012); Boston Edison Company, D.T.E. 99-57, at 3-4 (1999). The Department then balances the interests of the general public against the local interests and determines whether the line is necessary for the purpose alleged and will serve the public convenience and is consistent with the public interest.

B. Analysis and Conclusion

As described above in Section III through VI, the Siting Board examined: (1) the need for, or public benefits of, the proposed Project; (2) the environmental impacts of the proposed Project; and (3) any identified alternatives. With implementation of the specified mitigation measures proposed by the Company and the conditions set forth by the Siting Board in Section XII, below, the Siting Board finds pursuant to G.L. c. 164, § 72, that the proposed transmission line is necessary for the purpose alleged, would serve the public convenience, and is consistent with the public interest. Thus, the Siting Board approves the Section 72 Petition.

XI. SECTION 61 FINDINGS

The Massachusetts Environmental Policy Act ("MEPA") provides that "[a]ny determination made by an agency of the Commonwealth shall include a finding describing the environmental impact, if any, of the project and a finding that all feasible measures have been taken to avoid or minimize said impact." G.L. c. 30, § 61. Pursuant to 301 CMR 11.01(3), these findings are necessary when an Environmental Impact Report ("EIR") is submitted by a petitioner to the Secretary of Energy and Environmental Affairs, and should be based on such EIR. Where an EIR is not required, G.L. c. 30, § 61 findings are not necessary. 301 CMR 11.01(3).[38]

[38] As an EIR was submitted in this case, a finding under G.L. c. 30, § 61 is necessary for the Company's Zoning Exemption Petition and its Section 72 Petition. The Siting Board is not required to make a G.L. c. 30, § 61 finding under G.L. c. 164, § 69J because the Siting Board is exempt from MEPA requirements. G.L. c. 164, § 69I.

In this case, the record indicates that on April 15, 2014, the Company submitted an expanded Environmental Notification Form to the Secretary with a request for a single EIR (Exh. EV-3). On August 29, 2014, the Secretary issued a Certificate on the single EIR, stating that the Project adequately and properly complies with MEPA, and with its implementing regulations (Exh. EFSB-G-17(2)).

The Siting Board recognizes the Commonwealth's policies relating to GHG emissions, including G.L. c. 30, § 61 and the Executive Office of Energy and Environmental Affairs Greenhouse Gas Emission Policy and Protocol. The Siting Board notes that the Project would have minimal GHG emissions as it is an overhead transmission line.[39] As such, the Project would not have direct emissions from a stationary source or indirect emissions from energy consumption. In Section VI.C, above, the Siting Board conducted a comprehensive analysis of the environmental impacts of the proposed transmission line and switching station. Based on the record in this case, implementation of the required mitigation measures, and compliance with all applicable federal, state, and local laws and regulations, the Department finds that the Company has taken all feasible measures to avoid or minimize the environmental impacts of the Project.

XII. DECISION

The Siting Board's enabling statute directs the Siting Board to implement the energy policies contained in G.L. c. 164, §§ 69H to 69Q, to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. G.L. c. 164, § 69H. Thus, an applicant must obtain Siting Board approval under G.L. c. 164, § 69J, prior to construction of a proposed energy facility.

In Section III.D, above, the Siting Board finds that additional energy resources are needed to maintain a reliable supply of electricity within the Greater Boston Area.

---

[39] The Secretary's Certificate on the ENF states: "While the [P]roject is subject to the MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol, it falls under the de minimis exemption and NSTAR was not required to prepare a GHG analysis" (Exh. EFSB-G-17(2), at 3).

In Section IV.D, above, the Siting Board finds that the Project is superior to the other alternatives identified with respect to providing a reliable energy supply for the Commonwealth with minimum impact on the environment at the lowest possible cost.

In Section V, above, the Siting Board finds that the Company has developed and applied a reasonable set of criteria for identifying and evaluating alternatives to the Project in a manner that ensures that the Company has not overlooked or eliminated any routes that, on balance, are clearly superior to the Project. The Siting Board also finds that the Company has identified a range of practical transmission line routes with some measure of geographic diversity. Consequently, the Siting Board finds that Eversource has demonstrated that it examined a reasonable range of practical siting alternatives.

In Section VI.F, above, the Siting Board finds that the proposed facilities along the Primary Route would be superior to the proposed facilities along the Noticed Alternative Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

In Section VI.F, above, the Siting Board reviewed environmental impacts of the Project and finds that with the implementation of the specified mitigation and conditions, and compliance with all applicable local, state and federal requirements, the environmental impacts of the Project along the Primary Route would be minimized.

In Section VIII, above, the Siting Board finds that with the implementation of specified mitigation and conditions, the Project is consistent with the health, environmental and resource use and development policies of the Commonwealth.

In addition, the Siting Board has found pursuant to G.L. c. 164, § 72, that Eversource's proposed transmission line is necessary for the purpose alleged, and will serve the public convenience and is consistent with the public interest, subject to the following Conditions A through N.

In addition, the Siting Board has found pursuant to G.L. c. 40A, § 3, that construction and operation of the Company's proposed facilities are reasonably necessary for the public convenience or welfare. Accordingly, the Siting Board approves Eversource's Petition for an exemption from certain provisions of the Zoning Bylaws of Walpole, Sharon, and Holbrook, as

enumerated in Section IX.B, above. The Siting Board also approves Eversource's Petition for comprehensive exemption from the Zoning Bylaws of Walpole, Sharon, and Holbrook.

Accordingly, the Siting Board APPROVES the Company's Petition to construct the Project using the Primary Route, as described herein, subject to the following Conditions A through P.

A. The Siting Board directs the Company to follow all applicable guidelines developed to limit wildlife and resource impacts in vegetation management areas.

B. The Siting Board directs the Company to adhere to construction best management practices, such as the restoration of disturbed areas after construction, including at the Stoughton Switching Substation. Further, the Siting Board directs the Company to contact Ms. Munroe to fulfill its assurances to her in this proceeding regarding the repair of prior damage to her property.

C. The Siting Board directs the Company to offer, on a case-by-case basis, appropriate off-site screening for affected residences in areas of the Project where visual impacts may occur, particularly in the vicinity of the West Walpole to Walpole Substation DCT separation, the Stoughton Switching Station, and the Holbrook Substation.

D. The Siting Board directs the Company to provide, within 60 days of the completion of construction, a report that it has completed the clean-up of all debris (e.g., old poles, fencing, and trash) from the ROW. The report should describe whether the abutters' concerns have been fully addressed. In addition, the Company must meet its ongoing operating and maintenance requirements for its ROW facilities.

E. The Siting Board directs the Company to limit construction of the Project to Monday through Friday, from 7:00 a.m. to 6:00 p.m., and from 9:00 a.m. to 5:00 p.m. on Saturdays. Saturday construction is not allowed in areas with residential abutters within 100 feet of construction work areas or activities. Work that necessarily has a longer required continuous duration than normal construction hours allow (such as that associated with outage dependent work activities) shall be exempted from the above weekday and Saturday limitations.

Should the Company need to extend construction work beyond those hours and days (with the exception of emergency circumstances on a given day that necessitate extended hours), the Siting Board directs the Company to seek written permission from the relevant municipal authority before the commencement of such work, and to provide the Siting Board with a copy of such permission. If the

Company and municipal officials are not able to agree on whether such extended construction hours should occur, the Company may request prior authorization from the Siting Board and shall provide the relevant municipality with a copy of any such request.

The Company shall inform the Siting Board and the relevant municipality in writing within 72 hours of any work that continues beyond the hours allowed by the Siting Board. The Company shall also send a copy to the Siting Board, within 72 hours of receipt, of any municipal authorization for an extension of work hours. Furthermore, the Company shall keep records of the dates, times, locations, and durations of all instances in which work continues beyond the hours allowed by the Siting Board, or, if granted extended work hours in writing by a municipality, work that continues past such allowed hours, and must submit such record to the Siting Board within 90 days of Project completion.

F. The Siting Board directs that the Company, in consultation with Walpole, Sharon, Canton, Stoughton, Avon, Randolph, and Holbrook, develop a detailed community outreach plan for Project construction. The outreach plan should list residents, businesses, and officials the Company would notify in each community and detail how notification of the listed residents, businesses, and officials would occur for each of the following: start, duration, and hours of typical construction; construction the Company intends to conduct that, due to unusual circumstances, must take place outside typical hours; web-based Project information; and complaint and response procedures that include the Company's contact information.

G. The Siting Board directs the Company to limit equipment and/or worker parking, including parking by any contractor on its Project, to Company-owned property, including substations, and to Company-designated areas along the ROW. The Siting Board further directs the Company, if its construction contractor has an interest in parking at a location along the ROW, to direct its contractor to use Company-owned property and areas along the ROW appropriate for this purpose. Such properties shall not include ROW properties subject only to Eversource easement rights.

H. The Siting Board directs the Company to alert Project neighbors a minimum of two weeks in advance of anticipated local construction and traffic impacts, and to provide this information on a project website.

I. The Siting Board directs the Company to provide a Project-specific phone number, staffed during all daytime construction hours, for public calls and concerns with respect to construction-related impacts; the Company should respond within 48 hours to calls received. Further the Company shall (a) keep a log of dates, times, and reasons for calls to its Project-specific phone line, and the

Company's response to calls received, and (b) file a copy of its phone log with the Siting Board each month during Project construction.

J. The Siting Board directs the Company to inform the Siting Board if it adds SF_6 to any equipment or replaces any equipment due to SF_6 loss at the Sharon Switching Station within five years of the completion and initial operation of the Project, after which time the Company will consult with the Siting Board to determine whether the Siting Board deems it appropriate to require continued reporting. So that the Siting Board can stay informed of Eversource's overall progress to reduce SF_6 emissions, the Board directs the Company to submit to the Siting Board a copy of its annual SF_6 reports it provided to MassDEP. Further, the Siting Board directs the Company to comply with 310 CMR 7.72.

K. The Siting Board directs the Company to implement adjusted (reverse) phasing for Segment 4 (Canton to Stoughton) as described in the record. Further, to accommodate the three-pole transition structure in a wetland area, the Siting Board directs the Company to develop a wetland replication area in the Canton Tap vicinity at a 2:1 ratio.

L. The Siting Board directs the Company, in this and all future projects, to maintain detailed records of communication between the Company and residents, and the Company and the host community, especially in regards to compliance with conditions. Furthermore, the Company shall submit the final as-built landscape plans for all on-site and off-site visual mitigation for this Project.

M. The Siting Board directs the Company and its contractors and subcontractors to comply with all applicable federal, state, and local laws, regulations, and ordinances from which the Company has not received an exemption.

N. The Siting Board directs the Company to submit to the Board an updated and certified cost estimate for the Project prior to the commencement of construction. Additionally, the Siting Board directs Eversource to file semi-annual compliance reports with the Siting Board starting within 60 days of the commencement of construction, that include projected and actual construction costs and explanations for any discrepancies between projected and actual costs and completion dates, and an explanation of the Company's internal capital authorization approval process.

O. The Siting Board directs the Company, within 90 days of Project completion, to submit a report to the Siting Board documenting compliance with all conditions contained in this Decision, noting any outstanding conditions yet to be satisfied and the expected date and status of such resolution.

P. Where any future deviations from the Settlement Agreement or Host Community Agreement's provisions constitute changes other than minor variations to the

Project, the Company is obligated to notify the Siting Board in writing so that it may consider whether further inquiry is required.

Because issues addressed in this Decision relative to this facility are subject to change over time, construction of the proposed Project must be commenced within three years of the date of the Decision.

In addition, the Siting Board notes that the findings in this Decision are based upon the record in this case. A project proponent has an absolute obligation to construct and operate its facility in conformance with all aspects of its proposal as presented to the Siting Board. Therefore, the Siting Board requires Eversource, or its successors in interest, to notify the Siting Board of any changes other than minor variations to the proposal so that the Siting Board may decide whether to inquire further into a particular issue. Eversource or its successors in interest are obligated to provide the Siting Board with sufficient information on changes to the proposed Project to enable the Siting Board to make these determinations.

The Secretary of the Department shall transmit a copy of this Decision and the Section 61 findings herein to the Executive Office of Energy and Environmental Affairs and the Company shall serve a copy of this Decision on the Town of Walpole, Sharon, and Holbrook Planning Board, and the Zoning Board of Appeals for the three towns within five days of its issuance. The Company shall certify to the Secretary of the Department within ten business days of issuance that such service has been made.

Stephen H. August

Stephen H. August, Presiding Officer

Dated this 20th day of September 2017

APPROVED by the Energy Facilities Siting Board at its meeting on September 20, 2017, by the members present and voting. Voting for the Tentative Decision as amended: Matthew A. Beaton, Secretary of Energy and Environmental Affairs, Chairman; Angela M. O'Connor, Chairman of the Department of Public Utilities; Cecile M. Fraser, Commissioner of the Department of Public Utilities; Joanne Morin, Deputy Commissioner, Energy Policy, Planning & Analysis, of the Department of Energy Resources and Designee for the Commissioner of the Department of Energy Resources; Gary Moran, Deputy Commissioner of the Department of Environmental Protection and Designee for the Commissioner of the Department of Environmental Protection; Erica Kreuter, MassWorks Infrastructure Program Director, and Designee for the Secretary of the Executive Office of Housing and Economic Development; Glenn Harkness, Public Member; Joseph Bonfiglio, Public Member; and Mark Kalpin, Public Member.



Matthew A. Beaton, Chairman
Energy Facilities Siting Board

Dated this 20th day of September 2017

Appeal as to matters of law from any final decision, order or ruling of the Siting Board may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the order of the Siting Board be modified or set aside in whole or in part. Such petition for appeal shall be filed with the Siting Board within twenty days after the date of service of the decision, order or ruling of the Siting Board, or within such further time as the Siting Board may allow upon request filed prior to the expiration of the twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the clerk of said court. Massachusetts General Laws, Chapter 25, Sec. 5; Chapter 164, Sec. 69P.