The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

D.P.U. 20-67 May 6, 2022

Petition of NSTAR Electric Company d/b/a/ Eversource Energy Pursuant to G.L. c. 164, § 72 for Approval to Construct and Operate a New 115 kV Overhead Transmission Line in Carver, Plympton, and Kingston, Massachusetts.

APPEARANCES: Catherine Keuthen, Esq.
Cheryl Blaine, Esq.
Keegan Werlin LLP
99 High Street, Suite 2900
Boston, MA 02110
FOR: NSTAR ELECTRIC COMPANY d/b/a Eversource Energy
Petitioner

Jonathan E. Devine
Michelle Ruxton
36 Spring Street
Plympton, MA 02367
FOR: Pro Se
Intervenors

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I. INTRODUCTION

A. Description of the Proposed Project

On June 5, 2020, NSTAR Electric Company d/b/a Eversource Energy ("Eversource" or "Company") filed a petition ("Petition") with the Department of Public Utilities ("Department") pursuant to G.L. c. 164, § 72, seeking approval to construct a new, approximately eight-mile, 115 kilovolt ("kV") predominantly overhead electric transmission line (the "New Line") that would extend through parts of Carver, Plympton, and Kingston, Massachusetts, on an existing Eversource 150-foot-wide right-of-way (Exh. EV-1, at 1, 6; Company Brief at 1). The construction of the New Line, its support structures, the underground portion, and the related connections to substations constitute the "Project." The Project location is shown in Figure 1, below.

Figure 1. Project Location.

Adapted from: https://www.eversource.com/content/docs/default-source/project-maps/carver-kingston-map.pdf.

The proposed route for the New Line begins at Carver Substation, located off Main Street in Carver, and extends a total of eight miles northward to Kingston Substation, located on Pembroke Street (Route 27) in Kingston (Exh. EV-1, at 1, 6). For the southern five miles – from Carver Substation to Brook Street Substation in Plympton – the route for the New Line runs in the same right-of-way and parallel to Line 116, which is an existing 115 kV line (id. at 6, app. F). North of Brook Street Substation, the route continues approximately three miles to the Company's Kingston Substation, in the same right-of-way and parallel to both existing Line 117, which is a 115 kV transmission line, and an existing 23 kV distribution line (id. at 6, 7, app. F). Eversource would designate the New Line as Line 147 (id. at 6). In addition, Eversource proposes to replace three angle structures on

Line 117 as part of the Project to eliminate guy wires and anchors that would interfere with the placement and construction of structures for the New Line (id. at 8). The Company proposes to construct a total of 63 new structures (id. at 48; Company Brief at 53).

Eversource stated that, due to line clearance requirements for existing overhead lines near the Brook Street Substation, it would install approximately 1,200 feet of the New Line underground, bypassing that substation (Exh. EV-1, at 7).[1] The Company also noted that installing this segment of the New Line underground allows construction to proceed without modification to, or outages of, the existing lines (id.). To connect the overhead and underground line sections, Eversource would install transition structures north and south of the Brook Street Substation (id.).

As noted above, the Project would also include work at the Kingston and Carver Substations (Exh. EV-1, at 8). The Kingston Substation presently interconnects both Line 117 and Line 191 (id. at 23, 25, 27, 30). At the Kingston Substation, Eversource would install a termination position – including a circuit breaker with associated disconnect switches, relays, and a control system – to terminate the New Line (id. at 8). At the Carver Substation, the Company would use an existing spare terminal to accommodate the New Line but would also install a circuit breaker with associated disconnect switches, relays, and control system (id.). All such work will occur within the existing fenced areas of the

[1] Five 115 kV lines – Lines 116, 117, 132, 133, and 194 – all connect at Brook Street Substation (Exh. EV-1, at 5, 7, app. H at 15). In addition, a 345 kV line, designated as Line 342, passes by the Brook Street Substation (id. at 7).

Kingston and Carver Substations; as such, the Company expects no expansion of the existing fenced areas would be required at either substation (id. at 46).

Construction of the Project is expected to take approximately ten months and has an estimated cost of $33.1 million (-25%/+25 percent) (Exh. EV-1, at 8). Eversource noted that the cost estimate is inclusive of engineering, project management, siting, permitting, materials, construction, and testing (id.). The Company intends to submit a Transmission Cost Allocation to ISO-New England ("ISO-NE") for regional rate recovery approval (Exh. DPU-C-1).

The Project is one of a group of reliability projects identified by ISO-NE through its regional planning process for the Southeast Massachusetts/Rhode Island ("SEMA-RI") area that would reinforce the transmission system in the SEMA-RI area so that it meets national and regional electric reliability standards (Exh. EV-1, at 2). ISO-NE has designated a portion of the SEMA-RI region as "Subarea 3," which includes many municipalities south of Boston, starting at Cohasset and extending south into part of Plymouth and west to include all or parts of Middleborough, Bridgewater, and Brockton (id. at 2, 3). Within Subarea 3, ISO-NE has designated all or parts of Kingston, Plymouth, Duxbury, Marshfield, Pembroke, Plympton, and Carver as the "Kingston Load Pocket" (id.). ISO-NE and Eversource identified the potential for line overloads and low voltage which would compromise the transmission system's reliability and could impact some of the 44,000 customers in the Kingston Load Pocket (id. at 2, 17). The Project is designed to address the contingency

conditions that might compromise the transmission system's reliability at peak load in the Kingston Load Pocket (Exh. EV-1, at 2, 3, 5, 6, 22, 23).

B. Procedural History

Prior to filing the Petition in this proceeding, Eversource held four outreach meetings with local officials (Exh. EV-1, at 10). Specifically, representatives of the Company met with the town administrators of Kingston, Carver, and Plympton on May 18, 2018, September 24, 2018, and October 3, 2018, respectively (id.). In addition, Eversource representatives met with the Kingston conservation agent on August 29, 2019 (id.). The Company stated that it has kept municipal officials informed of the Project status since these meetings by email (id.).

Before filing the Petition, the Company also held open houses on August 13, 2019, at Carver Town Hall, and on August 14, 2019, at Kingston Town Hall (Exh. EV-1, at 9). The Company sent invitations for the two open houses to property owners within 300 feet of the Project, and a quarter mile of the Carver and Kingston Substations, and to municipal officials in Carver, Kingston, and Plympton (id.). The Company also engaged in door-to-door outreach to property owners directly abutting the right-of-way and substations (id.). After the open houses, the Company followed up with additional door-to-door outreach and mailings to abutters within 300 feet of the right-of-way and to abutters within a quarter mile of the Carver and Kingston Substations (Tr. 1, at 35, 36).

The Company filed its Petition with the Department on June 5, 2020. On October 7, 2020, the Department issued an Order of Notice requiring Eversource to publish the Notice

of Public Comment Hearing/Notice of Adjudication ("Notice") in the Patriot Ledger and the Old Colony Memorial. As directed by the Department, the Company provided Notice to the Select Boards, Town Administrators, Planning Boards, Zoning Boards of Appeals, Conservation Commissions, and Departments of Public Works for the towns of Plympton, Carver and Kingston; all persons owning real estate abutting the property to be used for the Project; owners of properties opposite the property to be used for the Project across any public or private street or way; and abutters to abutters within three hundred feet of the property to be used for the Project. Due to the Commonwealth's State of Emergency relating to Covid-19, the Department conducted a duly noticed remote public comment hearing on October 27, 2020.[2] Jonathan Devine and Michelle Ruxton, who jointly own property that abuts the Company's right-of-way, timely filed a motion to intervene, which the Hearing Officer allowed.[3]

The Company sponsored the following thirteen Eversource employees as witnesses: (1) Philip Barthel, siting; (2) Elizabeth Johnson, project management; (3) Elizabeth McKenna, transmission planning; (4) Robert Andrew, transmission planning; (5) Keith Jones,

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[2] The public's comments were primarily questions about pole placements, switching to the other side of the right-of-way, and using the vacant side of existing structures (Public Comment Hearing Transcript at 18-33). The public also asked questions and offered comments about electrical grounding, electromagnetic fields and undergrounding more of the line, hours of construction and noise, and discouraging all-terrain vehicle use (id. at 34-53).

[3] In their petition to intervene, Mr. Devine and Ms. Ruxton articulated concerns regarding visual impacts and the health effects of "increased magnetic field exposure" (Petition of Jonathan Devine and Michelle Ruxton, November 9, 2020, at 1).

forecasting; (6) Daniel Ludwig, forecasting; (7) David Burnham, non-transmission alternatives ("NTAs"); (8) Christopher Soderman, engineering and magnetic fields; (9) John Zicko, substation engineering; (10) Allison Klein, underground transmission engineering; (11) Hans van Lingen, environmental licensing and permitting; (12) Ryan Earle, community relations; and (13) Shawn Southworth, rights and survey. In addition, the Company also sponsored testimony from (1) Vivian Kimball, Vanasse Hangen Brustlin Inc., environmental consultant; and (2) Megan Aconfora, Burns & McDonnell, outreach consultant.

On January 22, 2021, the Department issued a set of information requests to the Company, which the Company responded to on February 10, 2021. The Department conducted two days of remote evidentiary hearings on March 16, and March 18, 2021. The intervenors did not attend the evidentiary hearings; however, they submitted written questions which the Hearing Officer asked of the Company's witnesses (Tr. 1, at 153-160; Tr. 2, at 349-356).[4]

The Department issued 21 record requests during the evidentiary hearings; and on April 14, 2021, the Department issue a set of 15 additional record requests along with a briefing question.[5] On June 17, 2021, the Department conducted an off-the-record technical session via videoconference with representatives of the ISO-NE and the Company. All

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[4] The intervenors did not present any witnesses or submit any pre-filed testimony, nor did they issue discovery. The intervenors did not file a brief.

[5] The briefing question issued was: "Considering all relevant evidence and testimony, compare future loads and trends in the Kingston Load Pocket forecast by Eversource to forecast loads and trends in the Kingston Load Pocket based on ISO-NE modeling; please provide a complete explanation of the difference."

parties were provided with notice of this technical session, which was also open to the public. On July 6, 2020, after conclusion of the technical session, the Department issued ten additional record requests.[6] Approximately 234 exhibits were entered into the evidentiary record. The Company filed a brief on August 11, 2021.

II. REQUEST FOR AUTHORITY TO CONSTRUCT AND USE TRANSMISSION LINE PURSUANT TO 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.[7]

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). All factors affecting any aspect of the public interest and public convenience

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6 In responding to these record requests, the Company consulted with ISO-NE representatives and based its answers to certain questions on ISO-NE's input (Exh. DPU-1; see also, RR-DPU-37 to RR-DPU-46).

7 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.

must be weighed fairly by the Department in a determination under Section 72. Town of Sudbury v. Department of Pub. Utils., 343 Mass. 428, 430 (1962); NSTAR Electric Company d/b/a Eversource Energy, D.P.U. 19-80, at 6 (2020) ("Barnstable").

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 present or proposed use and any alternatives identified; and (3) the environmental impacts or any other impacts of the present or proposed use. Barnstable at 7; NSTAR Electric Company d/b/a Eversource Energy, D.P.U. 19-46, at 5 (2020) ("Dartmouth"); New England Power Company d/b/a National Grid, D.P.U. 12-02, at 37-38 (2012). 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. Save the Bay, Inc. v. Department of Public Utilities, 266 Mass. 667, 680 (1975); Town of Truro v. Department of Public Utilities, 365 Mass. 407 (1974); Barnstable at 7.

B. Public Convenience and Public Interest

1. Need for or Public Benefit of the Proposed Use

In this section, the Department describes the need for the Project as initially projected based on regional ISO-NE forecasts, followed by a description of Eversource's internal forecast. The Department then discusses various factors that contributed to the difference between the two forecasts and evaluates the need for the Project with consideration of both forecasts.

a. ISO-NE Needs Assessments

i. 2016 Needs Assessment

ISO-NE operates the various transmission networks owned by electric utilities in New England as a single transmission system (Exh. EV-1, at 13). As part of its role as the independent system operator of New England, ISO-NE carries out a regional system planning process in which it conducts periodic needs assessments on a system-wide or area-specific basis and develops an annual regional transmission plan using a ten-year planning horizon (id. at 14-15). Transmission system planning in New England must comply with electric reliability standards established by the National Electric Reliability Corporation ("NERC"), Northeast Power Coordinating Council ("NPCC"), and ISO-NE (id. at 13). In 2015, ISO-NE convened a working group consisting of representatives from ISO-NE, National Grid, Eversource, and Middleborough Gas & Electric Department to conduct an extended study of the transmission system that serves SEMA-RI under stressed system conditions ("ISO-NE Working Group") (id. at 16, app. I at 35). ISO-NE published the SEMA-RI 2026 Needs Assessment in May 2016 ("2016 Needs Assessment"), which evaluated transmission reliability for the years 2016 to 2026 (id. at 17-18).

ISO-NE based its analysis and study assumptions for the 2016 Needs Assessment on the 2015 version of its regional and statewide Forecast Report of Capacity, Energy, Loads, and Transmission ("CELT Report") (Exh. EV-1, app. H at 17). The 2016 Needs Assessment revealed network reliability deficiencies throughout the SEMA-RI region (Exh. EV-1, app. I at 34). Eversource maintains that most of these deficiencies involved large pockets of load being served by a relatively small number of connections to the high-voltage

(i.e., 345 kV) transmission network (id., app. I at 34). According to Eversource, this situation could result in thermal overloads, low voltage, or voltage collapse following N-1-1 contingencies (Exh. EV-1, at 17-18).[8,9]

In the Kingston Load Pocket, ISO-NE identified planning criteria violations including potential thermal overloads for Lines 191 and 117, and potential low voltage conditions at the Brook Street and Kingston Substations that could result if certain N-1-1 contingencies occur at peak load conditions (Exh. EV-1, at 22-23).[10] The 2016 Needs Assessment determined that these reliability needs were time-sensitive – i.e., the planning criteria would be violated within three years of the date the needs assessment was issued, because the potential for thermal overloads and low voltage conditions in the event of certain N-1-1 contingencies exists already, with the earliest "year of need" being 2016 (Exhs. EV-1, app. H at 135; DPU-N-10).

To identify preliminary solutions to the needs identified in the 2016 Needs Assessment, ISO-NE conducted the Southern Massachusetts and Rhode Island Area 2026

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8 N-1-1 contingencies represent the loss of two transmission elements in sequence (Exh. EV-1, at 18-19).

9 Thermal overloads can require dispatchers to shed load to bring the system back in compliance with operating criteria and to prevent equipment damage (Tr. 2, at 182). Low voltage can cause damage to both substation equipment as well as customer equipment (id. at 181). Voltage collapse creates the potential for widespread cascading outages (Exh. EV-1, app. G at 5).

10 The peak load forecast assumed 90/10 weather conditions for modeling summer peak load profiles (Exh. EV-1, app. H at 10). A 90/10 peak load forecast represents peak load during weather scenarios that have a ten percent chance of being exceeded in a given year (Exh. EV-1, at 19, n.10).

Solutions Study ("Solutions Study") and published the results in March 2017 (Exh. EV-1, at 18).[11] ISO-NE identified preferred solutions and then added those preferred solutions to its list of approved projects, which transmission owners/developers, such as Eversource, subsequently seek to permit as proposed projects and construct upon regulatory approval (Tr. 2, at 245). The ISO-NE Working Group identified the Project as the preferred solution to address the reliability needs in the Kingston Load Pocket in the Solutions Study (Exh. EV-1, at 30).

ii. 2020 Needs Assessment Update

Due to a decrease in forecasted peak loads, net of energy efficiency ("EE") and solar photovoltaics ("PV"), in the 2019 CELT Report (compared with the 2015 CELT Report), ISO-NE initiated a new evaluation of need in 2019 for projects identified by the Solutions Study that had not yet started construction (Exhs. EV-1, app. K at 7; DPU-N-4). Although ISO-NE deemed the need for the Project to be time-sensitive, the Company had not started construction by the time ISO-NE initiated the updated evaluation of need (Exhs. EV-1, at 23, app. K at 26; DPU-N-4).[12] ISO-NE first presented the results of its new study in April 2020 for the years through 2029 ("Needs Assessment Update"); ISO-NE subsequently revised and published the study in November 2020 ("Revised Needs Assessment Update") (Exhs. EV-1, app. K; DPU-N-10(1)). The Needs Assessment Update and the Revised Needs Assessment

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11 ISO-NE released the original version of the Solutions Study in February 2017 (Exh. EV-1, at 18).

12 The Company explained that it delayed initiating the Project permitting process due to ISO-NE's new evaluation (Exh. DPU-N-4).

Update were based on the 2019 CELT Report and 2020 CELT Report, respectively (Exhs. EV-1, at 25; DPU-N-11(1) at 10).

ISO-NE's updated assessments identified fewer criteria violations as compared to the 2016 Needs Assessment (Exh. EV-1, at 25). Nevertheless, the updated assessments still identified criteria violations including a potential low voltage condition at the Brook Street Substation and a potential thermal violation on Line 117 (Exh. DPU-N-11(1) at 22; RR-DPU-41). The Revised Needs Assessment Update also found that the potential voltage and thermal violations were still time-sensitive (Exhs. DPU-N-10; DPU-N-11(1) at 23, 84-85).

iii. Kingston Load Pocket

The Company described the Kingston Load Pocket. The Kingston Load Pocket is located within the ISO-NE-designated Subarea 3 of SEMA-RI (Exh. EV-1, at 2, 3). The Kingston Load Pocket comprises an area served by the Kingston, Duxbury, Marshfield, West Pond, and Brook Street Substations (id. at 5). The load pocket is served by three 115 kV lines, Lines 116 and 194 that feed into Brook Street Substation, and Line 191 which feeds into Kingston Substation (id. at 5, app. H at 15).[13] There are 44,000 customers served within the Kingston Load Pocket (id., at 5, 17). Under various N-1-1 contingencies at peak load levels, the ISO-NE 2016 Needs Assessment determined that certain lines would overload, leading to unacceptably low voltage in the area (id. at 17).

The Company stated that the low voltages predicted in the ISO-NE needs assessments

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[13] Line 194 shares double circuit tower structures with Line 342; Line 342 bypasses the Kingston Load Pocket and continues to other substations in Plymouth and Sandwich (Exh. EV-1, at 5-6).

could lead to load shedding in the Kingston Load Pocket (Exh. EV-1, at 17). The Company explained that the low voltages would cause some distributed energy resources serving the load pocket to trip offline automatically as a precautionary measure, increasing the need for operators to shed loads (Exh. DPU-N-2). The Company reported that, after being alerted of a first contingency (i.e., N-1), Eversource operators would only be able to transfer 6,300 customers to distribution circuits outside of the Kingston Load Pocket, leaving 6,700 customers in the load pocket without service in the event of a second contingency (id.). Eversource also indicated that the low voltage conditions could cause consequential loss of service for 26,000 customers that make up the "Duxbury Load Pocket" (Exh. EV-1, at 17-18).[14,15]

The Company maintains that the Project is needed to address the problems identified in the Kingston Load Pocket (Company Brief at 33). As an additional benefit of the Project, the Company indicated that the Project would provide an increase in the ability of the system to carry large power flows northward from anticipated offshore wind and distributed generation (Exh. DPU-PA-1; Tr. 2, at 200-203, 301-302).

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14 Consequential load loss refers to load that is no longer served by the transmission system when transmission facilities are automatically removed from service by a protection system operation designed to isolate a fault on the system (Exh. EV-1, at 3, n.1).

15 The Duxbury Load Pocket is within the Kingston Load Pocket and includes areas served by the Kingston, Duxbury, and Marshfield Substations (Exh. EV-1, at 3). The Company explained that while the improvement to reliability in the Duxbury Load Pocket is not required by ISO-NE or Eversource transmission planning criteria, the Project would improve reliability in the Duxbury Load Pocket by providing it with a third transmission source (id. at 3-4, 6, 28; Exh. DPU-N-17).

b. Eversource Forecast

Eversource conducted its own transmission system analysis for 2029 in the Kingston Load Pocket using an internal forecast from 2020 ("Eversource Forecast") (Exh. EV-1, at 26-27). In conducting the Eversource Forecast, the Company started with actual load levels measured at the individual substations in the Kingston Load Pocket prior to 2020 (id.; RR-DPU-38). The Company stated that it used an econometric model to measure how substations in the Kingston Load Pocket performed relative to the local system and projected the relationship into the future (RR-DPU-16). The Company then created a net load forecast that directly took into account the quantity and location of EE and PV already realized on the system (RR-DPU-38, at 3). In developing its forecast, the Company used the same generation dispatch cases in its analysis as those that ISO-NE used in the 2016 Needs Assessment (Exh. DPU-N-12). The Eversource Forecast predicted a 90/10 peak net load for the Kingston Load Pocket of 172 MW in 2029 (Exh. EV-1, at 26-27; RR-DPU-13).

The Company's analysis found that, in the event of certain N-1-1 contingencies under peak load conditions, Lines 117 and 191 would overload, and the Brook Street, West Pond, Kingston, Duxbury and Marshfield Substations would violate voltage limits in 2029 (Exh. EV-1, at 27). The Company stated that the critical load level for transmission modeling violations in the Kingston Load Pocket is about 117 MW, reflecting N-1-1 contingencies (RR-DPU-20; RR-DPU-20(S1)).[16] The Company noted that the critical load

[16] The critical load level is the load level at which the load pocket would experience voltage and/or thermal overloads in the event of an N-1-1 contingency (RR-DPU-20).

level is substantially below recent measured peak loads in the load pocket, most recently 165 MW in 2020 (RR-DPU-20(S1); RR-DPU-23(4)).

As noted above, the Eversource Forecast for 2029 is 172 MW in the Kingston Load Pocket (Exh. EV-1, at 26-27). In contrast, using ISO-NE's 2020 CELT Report, on which the Revised Needs Assessment Update is based, the forecasted 2029 summer peak net load is 120 MW for the Kingston Load Pocket (Exh. DPU-N-13, at 3).[17,18] The Company observed that its forecasted peak net load for the Kingston Load Pocket in 2029 is much higher than the load derived from the 2020 CELT Report (about 52 MW — or 44 percent higher) (Exh. EV-1, at 26-27; RR-DPU-37).

The Company reported that the ISO-NE's load forecast for 2029 of 120 MW is equivalent to a 3.5 percent year-on-year compound contraction within the Kingston Load Pocket (Exh. DPU-N-13; RR-DPU-23(4)). The Company indicated that this decrease in load is not realistic based on recent measured loads in the Kingston Load Pocket, which have remained stable from 2010 to 2020 (Exh. DPU-N-13; RR-DPU-16, at 2; Company Brief at 28). In addition, the Company indicated that its forecast for the year 2020 deviated from the

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17 The Company explained that CELT reports do not provide substation level forecasts; to obtain local forecasts, ISO-NE extracts bus level load, PV, EE, and DR values from its "library" of base cases and its "Basecase Database" (RR-DPU-23, at 2; RR-DPU-30).

18 By contrast, using the 2015 CELT Report, which informed the 2016 Needs Assessment, ISO-NE derived a 2026 summer peak net load of 178 MW for the Kingston Load Pocket (Exh. EV-1, at 21).

actual load by less than one percent, while the ISO-NE forecast deviated from actual load by more than 20 percent (RR-DPU-29).

Eversource and ISO-NE both recognize that there is a significant difference between their respective forecasts for the Kingston Load Pocket (Company Brief at 18, citing RR DPU-16; RR-DPU-37). The Company noted that criteria violations were identified using each of three load forecasts, as presented in the ISO-NE's 2016 Needs Assessment (based on peak loads from the 2015 CELT Report), ISO-NE's Revised Needs Assessment Update (based on peak loads from the 2020 CELT Report), and Eversource Forecast (based on the Company's specific local load forecast) (Company Brief at 32-33). The Company stated that the Project is needed to ensure system reliability in the Kingston Load Pocket under all three forecasts (Exh. EV-1, at 28; Company Brief at 32-33;).

c. Forecast Disparity

In response to questions from Department staff, Eversource conferred with ISO-NE to prepare an explanation of the disparity between forecasts (RR-DPU-37; Company Brief at 3-4). ISO-NE and Eversource presented several interrelated factors that the Company asserted could, in large part, explain the discrepancy between the Company's and ISO-NE's 2029 forecasted peak summer net load:

- Eversource and ISO-NE used different time frames for each peak load. For its forecast, the Company used the peak load of individual substations in the Kingston Load Pocket, which typically occurs later in the day (around 7:00 p.m.) than the New England-wide coincident peak (around 6:00 p.m.) (RR-DPU-15; RR-DPU-

37; RR-DPU-38). ISO-NE's methodology for developing its CELT Report forecasts, however, represent peak load at the time of the New England-wide coincident peak (RR-DPU-37; RR-DPU-38). Therefore, local level forecasts derived from the CELT Reports do not capture the peak load for the Kingston Load Pocket (RR-DPU-37).

- Eversource and ISO-NE used different forecasting procedures. Where the Eversource Forecast is, in part, extrapolated from the Company's substation level data for the Kingston Load Pocket, ISO-NE's forecasts are focused on regional and statewide trends that affect the reliability of the New England grid (Exh. EV-1, at 26-27; RR-DPU-16). ISO-NE creates load pocket-level forecasts by allocating the electric load from the state-wide forecasts to individual substation buses (Tr. 2, at 191-192; RR-DPU-37; RR-DPU-38). The Company explained that the ISO-NE models attribute a fixed percentage of Massachusetts load to the former Commonwealth Electric service territory, which includes Cape Cod, Plymouth, and New Bedford, as well as the City of Cambridge (RR-DPU-38).[19] The Company contends that ISO-NE's methodology resulted in an underestimation of electric load in the Kingston Load Pocket due to uneven growth in the former

[19] Eversource's current service territory consists of former Boston Edison and Commonwealth Electric service territories (RR-DPU-38).

Commonwealth Electric service territory (id.; RR-DPU-37).[20] Conversely, the Company's forecast was developed on a substation-by-substation basis, which resulted in a forecast for the load pocket that was not affected by growth in other areas of the Company's service territory (RR-DPU-38).

- Eversource and ISO-NE treated EE and PV adjustments differently. Eversource also explained that adjustments for EE and PV (which offset load) were significantly larger in the ISO-NE model (approximately 63 MW) compared to the Eversource forecast (approximately five MW) due to several differences in forecasting methodology (RR-DPU-16(1)). One such difference is that ISO-NE began its forecast with gross load, while Eversource began its forecast with net load; consequently, ISO-NE accounted for a larger amount of EE and PV compared to the Company's forecast (RR-DPU-16; RR-DPU-43). Eversource explained that, by design, ISO-NE's methodology included EE and PV resources from before the forecast period of 2010 to 2029 (RR-DPU-44).[21] In addition, while both the Company and ISO-NE treated behind-the-meter PV facilities (i.e., generators of less than one MW) as load reducers during contingency

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20 The Company indicated that load in Cambridge has been growing at a much high level than Cape Cod, Plymouth and New Bedford, which skews ISO-NE's forecast for the Kingston Load Pocket lower than it would in the absence of the fixed percentage allocation (RR-DPU-38).

21 Eversource explained that ISO-NE uses the gross load methodology to ensure proper accounting of historical EE and PV resources that are still participating in energy markets (RR-DPU-43).

circumstances, ISO-NE also treated larger stand-alone PV units (i.e., generators of more than one MW) as load reducers (while the Company counted larger stand-alone units as generation that would remain offline) (Exh. RR-DPU-23).[22] Finally, the Company contended that ISO-NE's method of allocating EE and PV load reductions to substations based on the substation's share of state-wide load at the time of state-wide peak implicitly makes an incorrect assumption that the EE and PV are uniformly proportional to substation loads (RR-DPU-37; RR-DPU-38).

- Eversource and ISO-NE assumed different availability factors for PV. ISO-NE uses a set availability factor of 26 percent of nameplate capacity for PV resources,[23] which it applied to the Kingston Load Pocket; while Eversource used 5.9 percent of nameplate capacity for the load pocket (RR-DPU-37; RR-DPU-38).[24]

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22 The Company explained that while both stand-alone and behind-the-meter PV generators would automatically trip offline in response to N-1-1 contingencies, behind-the-meter generators are required to automatically reconnect by IEEE Standard 1547 when voltage conditions improve (RR-DPU-23). In contrast, Eversource assumes that PV generators larger than one MW would remain offline (RR-DPU-23).

23 According to its Transmission Planning Technical Guide, ISO-NE determined that a 26 percent availability factor, representing the output of solar PV during the summer peak load period (i.e., 4 p.m. to 6 p.m.), is appropriate for transmission planning studies. See https://www.iso-ne.com/static-assets/documents/2020/06/transmission_planning_techincal_guide_rev6_1.pdf#page=31.

24 The Company explained its process of calculating the availability factor as follows: (i) The Company started with an availability factor of 17.5 percent of nameplate capacity, based on the time of the actual 2019 peak in the Kingston Load Pocket, which is later in the day than the coincident New England peak as forecasted in

Eversource contends that the factors discussed above result in an anomalous forecast by ISO-NE for the Kingston Load Pocket and concludes that its forecast is more representative than ISO-NE's forecast for the Kingston Load Pocket (Company Brief at 27, citing RR-DPU-37, RR-DPU-38). The Company stated that, because the factors are interrelated, it was not able to calculate the individual impact of each factor on the disparity in the forecasts for the Kingston Load Pocket (RR-DPU-38, at 3). The Company added that its use of actual individual substation data is more suitable for a small area made up of a few individual substations rather than ISO-NE's forecast that is based on system-wide CELT Reports (Company Brief at 27; RR-DPU-16; RR-DPU-38). Nevertheless, Eversource stated that both forecasts are reasonable and appropriate for different purposes; the primary purpose of ISO-NE forecasts is to ensure the reliability of the regional grid rather than projecting demand within an individual local load pocket (Company Brief at 32-33, app. A at 5; RR-DPU-16). The Company argued that its load forecast is more appropriate for the Kingston Load Pocket (Company Brief at 33).

d. Analysis and Findings

The need for the Project was initially presented in ISO-NE's 2016 Needs Assessment for the SEMA-RI area for the study period of 2016 – 2026 (Exh. EV-1, app. I at 34). Under

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ISO-NE's CELT Reports. (ii) The Company then performed calculations for future load-reducing contributions based on the amount of PV and DG generation presently in the interconnection queue. which would shift the peak load from 6:45 p.m. to 7:45 p.m. The later the time of the peak, the less PV generation that would be available to reduce load. (iii) The Company then estimated that solar PV contribution would be 5.9 percent of nameplate capacity at the forecast net peak load hour, 7:45 p.m. (RR-DPU-38).

certain N-1-1 contingency conditions, the Kingston Load Pocket area would experience thermal overloads for Lines 191 and 117, and voltage violations for buses at the Brook Street and Kingston Substations under the ISO-NE forecast (Exh. EV-1, at 23). In the 2017 Solutions Study based on the 2016 Needs Assessment, ISO-NE determined that the Project would ensure reliability in the load pocket (id. at 28-29). Due to a decrease in forecasted peak loads in the 2019 CELT Report, ISO-NE initiated a new evaluation of need in the SEMA-RI area for the study period 2019 – 2029, which was published in the Needs Assessment Update and Revised Needs Assessment Update in 2020 (Exhs. EV-1, app. K at 7; DPU-N-4; DPU-N-10(1)). While only two of the initial transmission violations identified by ISO-NE were still forecast, subsequent analyses found that the Project was still needed and time-sensitive (Exh. EV-1, at 25).

The record shows that some of the 44,000 customers served in the Kingston Load Pocket could be impacted by low voltage caused by the N-1-1 contingencies described in ISO-NE's needs assessments (Exh. EV-1, at 17). Furthermore, even if Eversource makes all of the distribution transfers available to it in response to a contingency, 6,700 customers would remain out of service (Exh. DPU-N-2). Additionally, 26,000 customers within the Duxbury Load Pocket (a smaller load pocket within the Kingston Load Pocket) would be at risk of losing service from consequential load loss due to low voltage conditions (Exh. EV-1, at 17-18).

Eversource carried out its own needs analysis for the Kingston Load Pocket using the same contingency conditions as ISO-NE and a local level forecast derived from actual

substation data collected by the Company (Exhs. EV-1, at 26-27; DPU-N-12). The record shows that the Eversource Forecast for the Kingston Load Pocket in 2029 predicted much higher load than the derived "ISO-NE forecast" for the same year: 172 MW (Eversource) compared with 120 MW (ISO-NE) (Exh. EV-1, at 26-27; RR-DPU-37). The Company's need analysis confirmed all of the transmission violations found in ISO-NE's initial 2016 Needs Assessment, and forecasted additional bus voltage violations at West Pond, Duxbury, and Marshfield Substations (Exh. EV-1, at 27). The Company contends that the load contraction projected by ISO-NE's 2029 forecast was unrealistic for the Kingston Load Pocket based on actual load levels measured by Eversource, and that the Eversource forecast is more appropriate (RR-DPU-16, at 2; Company Brief at 28). Nevertheless, the record shows that there are still criteria violations caused by various N-1-1 contingency conditions under both ISO-NE and Eversource assessments (Exh. EV-1, at 28).

The record shows that both ISO-NE and the Company recognize that there is a significant discrepancy between their forecasts for the Kingston Load Pocket (RR-DPU-37). ISO-NE and the Company attributed the discrepancy between the two forecasts to: (i) whether the peak load was modeled at system-wide coincident peak or non-coincident local peak conditions; (ii) different apportioning of load pocket demand due to ISO-NE's ratio-based methodology; (iii) differences in methodology for estimating load reducing EE and PV resources; and (iv) difference in assumed availability factor for PV resources in the load pocket (RR-DPU-37; RR-DPU-38). As a result of these differences, Eversource argues that

the Eversource Forecast is more relevant to anticipating needs in a small geographic area made up of a few substations, such as the Kingston Load Pocket (RR-DPU-38, at 3).

The Department and the Energy Facilities Siting Board have previously found ISO-NE's CELT Report-based forecasts reviewable, appropriate, and reliable in a number of recent decisions. See e.g., NSTAR Electric Company d/b/a Eversource Energy, EFSB 17-02/D.P.U. 17-82/17-83, at 26, n.29 (2019). However, the record shows that the load pocket level forecast apportioned from regional forecasts can differ significantly from the forecast extrapolated from actual substation data (RR-DPU-16; RR-DPU-38). The Department notes that ISO-NE's CELT Reports are primarily designed for forecasting regional and statewide trends rather than local trends (RR-DPU-16). ISO-NE and Eversource concur that ISO-NE's forecast is less representative than the Eversource Forecast for the Kingston Load Pocket (RR-DPU-37; RR-DPU-38). The record shows that, in recent years, the Eversource Forecast has been more accurate in predicting actual loads for the Kingston Load Pocket than ISO-NE's forecast (RR-DPU-29).

Therefore, the Department concludes that, for the Kingston Load Pocket, the Company's forecast is more suitable than the load-pocket forecast derived from ISO-NE's CELT Report. The record shows that the Project would solve the reliability needs identified by both ISO-NE and Eversource, thus ensuring reliability in the Kingston Load Pocket (Exh. EV-1, at 28). In addition, the record shows that the Project would add additional reliability benefits to the Duxbury Load Pocket (id. at 3-4, 28; Exh. DPU-N-17).

Accordingly, the Department finds that the Company has demonstrated that the Project is needed and that the construction and operation of the Project would result in public benefits.

2. Alternatives Explored

Eversource evaluated several non-transmission alternatives ("NTA") to the Project, including new energy resources such as combined solar PV and energy storage, and gas turbine generators (Exh. EV-1, at 29). Eversource also presented a no-build alternative, but did not evaluate it further, explaining that such an approach would prevent the Company from meeting mandatory transmission reliability standards and criteria (id. at 29-30). Additionally, the Company described three transmission alternatives identified in ISO-NE's 2016 Solutions Study to address the reliability needs in the Kingston Load Pocket (id.).

a. Non-Transmission Alternatives

Eversource indicated that, based on ISO-NE's forecasts, the minimum amount of new energy resources necessary to resolve the criteria violations (i.e., thermal overloads and voltage violations) identified in ISO's 2016 Needs Assessment is 50 MW (Exh. EV-1, at 37; RR-DPU-31).[25,26] The Company stated that these new energy resources would have to inject power into the system by connecting at the Kingston, Duxbury and/or Marshfield Substations

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25 Eversource stated that ISO-NE arrived at the value of 50 MW by modeling the addition of load reducers at Kingston Substation until overload conditions were eliminated (Exh. EV-1, at 37). As described above, Eversource's own forecast confirmed the transmission violations initially identified by ISO-NE (Exh. EV-1, at 27).

26 The Company stated that the amount of new energy resources necessary according to the Eversource Forecast is 58 MW (Exh. DPU-PA-8).

to resolve the projected transmission overloads from the N-1-1 contingencies addressed by the Project (Exh. EV-1, at 37).

The Company evaluated the following NTA technologies: active demand response (dispatched by ISO-NE); passive demand response (non-dispatched resources, a.k.a. energy efficiency measures); utility-scale or distribution-scale solar PV; combined and standalone energy storage; and "conventional" (e.g., natural gas) generation (Exh. EV-1, at 38). Eversource stated that in order for an NTA technology to be "technically feasible," the resource must be able to respond within 30 minutes of the occurrence of the first contingency and continue to operate reliably until the failure in the transmission system is repaired or loads sufficiently decline from peak (id.).[27] The Company projected that the overload duration of N-1-1 contingency conditions would be 23 hours out of a 24-hour day, based on the historical load and dispatch patterns in the area (id. at 39).

Eversource stated that 50 MW of active demand response and passive demand response resources is not feasible based on its experience (Exh. EV-1, at 38). The Company estimated the energy efficiency (i.e., passive demand response) adjustment for the year 2020 to be five MW (RR-DPU-29(1)). Similarly, the Company reported that solar PV without storage is not a feasible NTA for the Project because solar resources would not be available throughout the 23-hour projected overload duration of the N-1-1 contingency conditions

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[27] The Company explained that it used a 30-minute response time because NERC, NPCC, and ISO-NE reliability standards assume a 30-minute time window for system operators to carry system adjustment between the first and second contingencies (Exh. DPU-PA-10).

(Exh. EV-1, at 38-39). Additionally, the Company stated that energy storage alone is not a feasible alternative because there is not enough transmission capacity available to recharge a storage device in the one-hour per day outside of the projected overload duration (id.).

The Company concluded that solar PV paired with a battery energy storage system ("BESS"), and conventional combustion turbines were the only technically feasible NTA technologies for the Project (Exh. EV-1, at 39). Even then, the Company indicated that there are several challenges that prevent these technologies from being suitable alternatives to the Project including long development times, extensive land requirements, and additional infrastructure requirements (i.e., the completion of an interconnection study for the combined solar PV and BESS or securing an available fuel supply for the gas generation approach), as described below (id. at 39-42).

Eversource expects that a new 50 MW solar PV and BESS facility would require at least 2,750 acres (about 4.3 square miles) of land (Exh. DPU-PA-11(R1)). The Company asserted that it would be impractical and prohibitively expensive to acquire this amount of land in the towns corresponding to the Duxbury, Marshfield, or Kingston Substations (RR-DPU-19). For a gas-fired generator, the Company stated that it would have to obtain land zoned specifically for generating facilities and additional land for a gas supply lateral to the nearest natural gas pipeline (Exh. EV-1, at 40). The Company indicated that resolving these land requirements would be time consuming, as compared to the Project, which can be constructed within an existing right-of-way without requiring additional easements (id.; Exh. DPU-LU-5). The Company also noted that it is not aware of any paired solar PV and BESS

or conventional generation projects in the ISO-NE interconnection queue (Exh. EV-1, at 39).[28]

Regarding the cost of these alternatives, the Company estimated that construction of a 50 MW solar PV and BESS would cost approximately $600 million, and the least-expensive generation alternative, a frame turbine, would cost approximately $68 million, which is more than twice the approximate cost of the Project (Exhs. EV-1, at 33; DPU-PA-11(R1); DPU-PA-12). Moreover, the Company's estimated costs of the NTAs do not include acquisition of land, siting and permitting, and site preparation (Exh. EV-1, at 41; Company Brief at 44). The Company concluded that the Project, compared to the two technically feasible NTAs, would have a minimum impact on the environment at the lowest possible cost (Exh. EV-1, at 42).

b. Transmission Alternatives

For transmission alternatives, Eversource presented the analyses of the ISO-NE Working Group, which was included as part of ISO-NE's 2016 Solutions Study (Exh. EV-1, at 30). The ISO-NE Working Group considered three transmission alternatives in addition to the Project (which was designated as Alternative 2): (1) reconductoring 15.4 miles of

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[28] The Company argued that the Solar Massachusetts Renewable Target ("SMART") and Clean Peak Standard programs are not able to provide sufficient combined solar and storage resources to defer or eliminate the need for Project (RR-DPU-19). The Company maintained that, even with the SMART and Clean Peak Standard incentives, the required amount of resources would not be installed in a timely manner (id.). Furthermore, the Company stated that the SMART and Clean Peak Standard programs cannot ensure that resources will be developed in specific locations that will reduce predicted overloads (id.).

Line 191 and 3.1 miles of Line 117 (Alternative 1); (2) constructing a new 15.3-mile-long overhead line from Manomet Substation in Plymouth to Kingston Substation, in or parallel to an existing right-of-way (Alternative 3); and (3) constructing a new 4.9-mile long overhead transmission line between Carver Substation and Brook Street Substation parallel to an existing line, and reconductoring 2.3 miles of Line 117 between Brook Street Substation and Kingston Substation (Alternative 4) (id. at 30-31).

The ISO-NE Working Group, which Eversource took part in, compared the transmission alternatives in terms of cost, constructability, environmental concerns, and other criteria (Exh. EV-1, app. I, at 34). The Company stated that because the route for Alternative 4 would largely follow the route of the Project, the environmental impacts of both options would be similar (Exh. EV-1, at 35-36). The ISO-NE Working Group ultimately concluded that Alternative 4 would have the lowest environmental impact because it would avoid impacts associated with new poles adjacent to Line 117 in rare species habitat; however, the Project would contribute best to overall system performance, cost less to construct (about $1 million less than the next option), and require the fewest line outages during construction (id. at 35-37). The Company explained that the Project scored best for overall system performance because it would provide the most reinforcement to the regional transmission system (Exh. DPU-PA-7). Although Eversource anticipated that the Project would have the shortest construction duration, the Company acknowledged that the estimated construction durations for the four alternatives are within a similar range (Exh. DPU-PA-3;

Tr. 2, at 339-341). The estimated construction costs and durations for the transmission alternatives are presented in Table 1 below.

Table 1. Estimated construction costs and durations for the transmission alternatives.

Option	Estimated cost ($ million)[29]	Estimated duration (months)
Project/Alternative 2 (Construct new 8-mile line between Carver Substation and Kingston Substation)	33.1	10
Reconductor 15.4 miles of Line 191 and 3.1 miles of Line 117 (Alternative 1)	38.4	12 – 15
Construct new 15.3-mile line between Manomet Substation and Kingston Substation (Alternative 3)	34.3	11 – 14
Construct new 4.9-mile line between Carver Substation and Brook Street Substation, and reconductor 2.3 miles of Line 117 (Alternative 4)	34.4	10 – 13

Source: Exhs. EV-1, at 31-35; DPU-PA-3.

c. Analysis and Findings

Eversource presented analyses for several NTA technologies and three transmission alternatives to the Project (Exh. EV-1, at 28-29). The record shows that at least 50 MW of NTA resource would be needed to resolve the transmission violations identified by ISO-NE (id. at 37; RR-DPU-31). Energy efficiency and dispatched resources are not likely to reach the required 50 MW level needed to displace the need for the Project (Exh. EV-1, at 38). Also, solar PV or a BESS alone could not provide enough energy during the Company's modeled duration of the N-1-1 contingencies (id. at 38-39). Only solar PV combined with a BESS, or a natural gas-fired generator would be able to overcome these technical deficiencies

[29] According to Eversource, the estimated costs have a level of accuracy -50%/+200% (Exh. EV-1, at 31-35). The Company explained that the estimated costs it used are updated from the estimates referenced in the ISO-NE Solutions Study in 2017 (Exh. DPU-PA-2).

(id.). Nevertheless, developing these two "technically feasible" technologies at 50 MW scale would entail significantly more land acquisition, longer project development times, additional infrastructure requirements, and significantly higher costs than the Project (id. at 39-42).

For transmission alternatives, the Company described three transmission alternatives identified by ISO-NE in the 2016 Solutions Study (Exh. EV-1, at 30-31). ISO-NE determined that the Project is the best option based on cost, duration of line outages required for construction, and improvement to transmission system performance (id. at 36). The Department observes that the three transmission alternatives are within the same range for estimated cost and construction duration. Although Alternative 4 might have fewer environmental impacts compared to the Project, the Department finds that the relatively small difference in environmental impacts does not outweigh the reliability benefit of having an additional line in the Kingston Load Pocket, lower cost, and reduced need for line outages during construction, provided by the Project.

Accordingly, the Department finds that the Company's decision to pursue the Project rather than the alternatives is reasonable to meet the identified need, balancing reliability, environmental impacts, and cost.

3. Impacts of the Proposed Use

Eversource described its construction methods and identified potential environmental impacts from the construction and operation of the Project, and has proposed measures to limit impacts of construction and operation.

a. Construction Methods

Eversource explained the New Line would use an existing Eversource 150-foot-wide right-of-way, that has been largely cleared from edge to edge, and would involve several phases of construction including site preparation, structure assembly and installation, conductor stringing, and site restoration (Exh. EV-1, at 42-47). The Company stated that it will follow its best management practices for construction to minimize impacts associated with the Project (id. at 60). The Company expects to confirm the construction schedule as Monday to Saturday, generally during the hours of 7:00 a.m. to 7:00 p.m., following consultation with the Towns of Kingston, Plympton, and Carver (id. at 47). Eversource anticipates construction would last approximately ten months for the entire Project (id.).

The Company stated that contractors would access the existing maintained right-of-way from locations that cross public roads (Exh. EV-1, at 41). Construction vehicles would use existing gravel roads within the right-of-way; Eversource indicated that some portions of the access roads may require improvements (e.g., grading, adding gravel) (Exh. EV-1, at 44). Eversource does not anticipate the need for any temporary easements to facilitate construction access, although it would access the right-of-way via adjacent existing private and/or public access roads and parking lots (Exh. EV-1, at 44; DPU-LU-4). Eversource stated it would arrange for storage laydown areas for materials, equipment, and construction office trailers (Exh. EV-1, at 43).

Prior to beginning work, Eversource would install erosion and sedimentation controls (Exh. EV-1, at 59). The Company would establish a construction work area of

approximately 100 feet by 100 feet at each location of transmission structure installation (id. at 44). Additionally, Eversource identified eighteen potential pull pad locations for stringing conductors and the lightning shield wire (id.). Preparation of structure sites and pull pad locations may require vegetation removal and grading of the ground surface to provide safe and level work areas (id.). Eversource would install temporary construction mats to improve construction work areas and locations where existing resources require protection (e.g., lawns, wetlands) (id.).

To install monopole transmission structures and tangent H-frame structures, Eversource would use a drill auger or an excavator, to create the hole to embed the structures in the ground (Exh. EV-1, at 45). For the three-pole dead-end, angle structures, and transition structures, Eversource would construct reinforced caisson foundations with diameters between seven and ten feet, installed to depths of 15 to 30 feet (id.). The Company reported that, during the structure installation phase of the Project, it would bury the grounding wire using standard trenching equipment within the right-of-way (id.). The Company would transport structure segments to each site for installation on flat-bed tucks and from there, it would assemble each structure and lift each into place using a crane (id. at 46).

Subsequently, Eversource would install each conductor and shield wire using a method known as "tension stringing," which prevents the conductors from touching the ground during installation (Tr. 1, at 113, 114). Eversource explained that once each wire is strung, the wire would be "sagged" to the appropriate tension (Exh. EV-1, at 46; Tr. 1,

at 115). The Company noted that, if it is necessary to establish pull pads[30] within a wetland, it would use construction mats to minimize wetland impacts (Exh. EV-1, at 46).

Eversource stated that the underground section of the transmission line would start approximately 150 feet from the southwestern side of Brook Street Substation and run north and northeast for 1,200 feet before transitioning back overhead (Exh. EV-1, at 7, app. E at 9, 10). The Company would install the solid dielectric cable underground segment of the New Line in an approximately two-foot by three-foot concrete duct bank constructed using open-cut trenching methods (Exh. DPU-CM-1; Tr. 1, at 23, 31). Eversource indicated that the underground segment would not require any splice vaults (Exh. DPU-CM-1; Tr. 1, at 23, 31). The Company explained that, along with the underground cable, it would also install fiber optic communication conduits within the same duct bank (Tr. 1, at 23). At locations where the overhead line transitions to an underground line or vice versa, the Company would install a "transition structure" to carry the underground cable up to a point of connection with overhead conductors (id. at 22, 28; Exh. EV-1, at 46).

Following the conclusion of work at each structure, Eversource would begin clean-up and restoration efforts (Exh. EV-1, at 47). The restoration efforts would include seeding and mulching, as needed, to ensure stabilization of soils in accordance with permit conditions (id.). Eversource also stated that it would add wetland soils, rake out ruts, and seed areas

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30 Pull pads are defined workspaces that aid in the installation of conductor and shield wire (Exh. EV-1, at 46). The actual configuration of these areas would be determined and refined in the field based on site-specific conditions (Exh. EV-1, at 44).

with a wetland seed mix after the removal of construction mats to allow wetlands to re-vegetate (id.; Tr. 1, at 132). For the short in-street portion of the underground segment along Brook Street, Eversource would restore the pavement (Exh. DPU-CM-1). Lastly, the Company explained that it would remove construction debris and dispose of it in accordance with applicable laws and regulations (Exh. EV-1, at 47; Tr. 1, 132).

b. Land Use Impacts

Eversource asserted that there would not be any change to existing patterns of land use in the Project vicinity, with no impact to existing adjacent land uses anticipated along the Project route (Exh. EV-1, at 48). The Company concluded that there are no schools, recreation uses, nursing homes, hospitals, daycare centers, religious facilities, or libraries within 100 feet of the Project right-of-way (Exh. DPU-LU-1). Eversource stated that neither construction nor operation of the Project would require it to acquire new permanent property rights (Exhs. EV-1, at 48; DPU-LU-5). Eversource characterized existing land uses adjacent to the right-of-way as including a mixture of low-density residential areas, commercial cranberry operations, industrial sand and gravel operations, and municipal conservation land (Exh. EV-1, at 48). Table 2 below provides a summary of land use parcels at various distances from the edge of the Project right-of-way (Exh. DPU-LU-1).

Table 2. Number of Parcels in Each Land Use along Project Right-of-Way by Distance.

	Distance from Right-of-way Edge (feet)		
Parcel Use	**< 25**	**> 25 and < 50**	**> 50 and < 100**
Residential	113	16	28
Commercial/Industrial	26	6	3
Conservation	7	1	0
Agricultural	16	0	0
Fire Stations	1	0	0
Vacant	19	1	2

Source: Exh. DPU-LU-1.

Eversource stated that, while the right-of-way is largely cleared from edge to edge, some tree clearing along the right-of-way, including a few non-compatible trees, would be necessary prior to Project construction (Exhs. EV-1, at 43, 44; DPU-LU-8). The Company indicated that it would allow "compatible" vegetation to grow within the right-of-way as long as such vegetation does not conflict with the safe access, construction, operation, and maintenance of the lines (Exh. DPU-LU-11). Eversource reported that it would maintain the right-of-way in accordance with its 2018 to 2022 five-year Vegetation Management Plan ("VMP") approved by Massachusetts Department of Agricultural Resources (Exh. DPU-LU-6).[31] The Company stated that it has identified where tree pruning is needed both within and outside of the right-of-way (Tr. 1, at 52).

The Company explained that there are a few individual trees of species that are not compatible with electrical transmission within the right-of-way and a few dozen "hazard

[31] Eversource explained that the purpose of the VMP, in relevant part, is to prevent any hazards to the line and/or obstructions to the Company accessing the right-of-way for transmission line maintenance purposes (Tr. 1, at 40).

trees"[32] located outside the right-of-way that it plans to remove (Exh. DPU-LU-8). Among the trees identified for removal, Eversource stated that ten trees are located within wetland resource areas and five are located in the 100-foot buffer zone to a resource area (id.). For trees outside the right-of-way, the Company stated that it will move forward with finalizing agreements with property owners to remove these trees after the Project is approved (Tr. 1, at 53). The Company is seeking to remove approximately 32 off-right-of-way trees spread among eight different property owners, in addition to 15 off-right-of-way trees identified on Hathaway Preserve and 22 off-right-of-way trees identified between Smith Fuller Way and Wapping Road (RR-DPU-2).[33] To avoid soil erosion if tree clearing does occur, the Company would use targeted herbicide application, which eliminates the need to do subsurface grubbing that could lead to increased risk of subsurface disturbance (Tr. 1, at 149-150).

Eversource noted that, according to a Natural Heritage and Endangered Species Program ("NHESP") review of the Project, portions of the Project site are located within mapped priority habitat for the eastern box turtle, which is considered a Species of Special Concern by the Massachusetts Endangered Species Act ("MESA") (Tr. 1, at 51). Eversource stated it would file a MESA Checklist to get a formal determination from the

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[32] A "hazard tree" has some structural defect making it susceptible to falling, making it an unacceptable risk with respect to injury, damage, or electrical system disruption related to the transmission of electricity (Exh. DPU-LU-9).

[33] Eversource explained that a field survey was conducted to identify trees that would need to be removed. An Eversource arborist has also identified areas where significant side-trimming is expected outside the right-of-way (Exh. DPU-LU-10).

Massachusetts Division of Fisheries and Wildlife ("MassWildlife") regarding whether the Project would involve a "take" of this state listed species (id. at 55-60; Exh. DPU-LU-16). If the Project is determined to result in a take, Eversource explained that NHESP would require mitigation measures, such as creating additional habitat (Tr. 1, at 63).

Additionally, Eversource stated that according to the U.S. Fish and Wildlife Service ("USFWS") database, the northern long-eared bat and the Plymouth redbelly turtle could be affected by Project construction (Exh. EV-1, at 58). The Company stated that there is no known hibernaculum for the bats in the vicinity of the Project and that Eversource would not work within the critical habitat of the redbelly turtle (id.). The Company stated that it would continue to coordinate with NHESP and USFWS regarding the Project's potential impacts to the northern long-eared bat, eastern box turtle, and Plymouth redbelly turtle (id.; Tr. 1, at 65).

Regarding historical and cultural resources, Eversource stated that it completed a preliminary review of cultural resources in August 2019 to examine whether any archaeological sites, pre-contact sites, historic properties or historic districts are located near the Project (Exh. EV-1, at 58). The Massachusetts Historical Commission ("MHC") requested that the Company conduct an intensive (locational) survey in archaeologically sensitive areas (id.). Eversource completed and filed its report to MHC on March 22, 2021 (Exh. RR-DPU-3(S1)). Eversource stated it will coordinate with MHC to develop measures to protect archaeological resources and ensure that impacts to cultural resources are properly minimized (Exh. EV-1, at 64; DPU-LU-13).

c. Visual Impacts

Eversource stated that, although the right-of-way already contains existing transmission and distribution lines, the Project could modify the appearance of the right-of-way (Exh. EV-1, at 50). The Company noted that it would pair new transmission structures with existing structures to minimize visual impacts of the new transmission structures (Exhs. EV-1, at 50; DPU-V-1; Tr. 1 at 90). The Company provided representative cross-sections for structures between the Carver Substation and Spring Street ("Segment I"), Spring Street and Brook Street Substation ("Segment II"), Brook Street Substation and Bog View Drive ("Segment III"), Structure 115 and Kingston Substation ("Segment IV"), and Structure 44 (Exh. EV-1, app. F at 1-5). The segments correspond to stretches of the New Line within the right-of-way that have distinct structure heights, structure types, and positions within the cross-sections of the right-of-way (Exh. DPU-V-1).

Within Segment I, Eversource would install the New Line adjacent to the existing Line 116, which is supported on galvanized steel monopole structures ranging in height from 78-feet to 121-feet above grade (Exh. EV-1, at 50). For Segment I, Eversource would use H-frame structures, that are about the same height as the existing structures, installed within the center of the right-of-way, creating less visual impacts (id. at 50, app. F at 1-5; Exh. DPU-V-1(1)).

Within Segment II, Eversource would install the New Line on single-circuit monopoles in the center of the right-of-way, which are similar in height or lower than the existing structures (Exhs. EV-1, at 50, app. F at 1-5; DPU-V-1(1)). Eversource noted that

new structures installed within Segments I and II would have the same finish as existing structures for Line 116 (i.e., galvanized steel); Eversource maintains that matching the finish of existing structures contributes to minimizing visual impacts of the Project (Exh. EV-1, at 50; Company Brief at 40).

For Segments III and IV, Eversource would install the New Line on single circuit monopoles along the eastern edge of the right-of-way (Exh. EV-1, at 50, app. F, at 3-4). For both segments, the New Line would run parallel to Line 117, which is mainly installed on two pole H-frame structures (id.; Exh. DPU-V-1(1)). The monopole structures proposed for the New Line would be approximately 35 to 65 feet taller than existing structures (Exh. DPU-V-1(1)). Eversource maintains that using weathering-steel structures for Segments III and IV (except the underground portion near the Brook Street Substation) would better match the existing wood structures and more easily blend in with the wooded surroundings, minimizing the visual impact of the taller structures (Company Brief at 56; Exh. EV-1, at 51).

Structure 44, a proposed monopole just north of Bog View Drive, would be located in a relatively open, residential area and would be taller than adjacent structures proposed for the New Line and taller than the existing structures for Line 117 (Exh. EV-1, app. E, at 11, app. F, at 4; Tr. 1, at 79-80). In response to questions from Department staff, the Company presented a design variation that would allow for a 15-foot reduction in the total height of Structure 44 (RR-DPU-7(S1)). Eversource explained that, because of the distance between adjacent structures and the need to cross above existing distribution lines, reducing the height

of Structure 44 would require the addition of an intermediate monopole structure immediately south of Structure 44 (id.; Tr. 1, at 82). The Company noted that the new intermediate structure would be located in the same, relatively open residential area; the design variation has an estimated cost of $154,000 (RR-DPU-7(S1)).

As previously noted, the Company also proposed to replace three angle structures on Line 117 as part of the Project to achieve clearance requirements necessary for installing the New Line (Exh. EV-1, at 8). Eversource stated that the replacement structures would be within 20 feet of their existing locations and within ten feet of their existing heights (id.).

Eversource indicated that, although some tree clearing would be required for the Project, the tree clearing would not significantly alter the visibility of the right-of-way (Exh. DPU-V-5; Company Brief at 56). Eversource noted that it has maintained communication with the residents who have expressed concerns regarding the location of poles relative to their homes and off-right-of-way "hazard tree" removal (Exh. DPU-G-2).

As noted above, no expansions are anticipated at the substation locations and all work will occur within the existing fenced areas of the substations (Exh. EV-1, at 46). Therefore, Eversource stated that it expects no change in the visual impacts at the substations (id. at 50).

d. Wetlands and Water Resources

The Company explained that the Project was designed to minimize impacts to wetland resource areas to the extent possible (Exh. EV-1, at 48). Eversource stated that only eight of the 63 new structures would require construction matting through wetland resource areas or their buffer zones for construction vehicle access, work pads, or pull pads (Exh. EV-1,

at 48).[34] Eversource estimated that the Project construction would result in 39,015 square feet (0.90 acres) of temporary impacts to Bordering Vegetated Wetland ("BVW"), as outlined in Table 3 below (Exh. EV-1, at 49).

One structure would be located within a wetland resource area, resulting in approximately 30 square feet of permanent impacts (Exh. EV-1, at 49). Eversource stated that it would mitigate the permanent impact by developing a wetland replication plan for 30 square feet that is acceptable to the Carver Conservation Commission (Exh. DPU-W-6). Eversource would keep erosion controls in place at the limits of the work area until vegetation is restored (Tr. 1, at 132). The Company intends to file notices of intent for wetland permits (orders of condition) with the Conservations Commissions of the Towns of Carver, Plympton, and Kingston as required by the Massachusetts Wetlands Protection Act (Exh. EV-1, at 61; Tr. 1, at 134).

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[34] One structure is proposed on the outer limit of the floodplain associated with an unnamed waterbody in the Town of Carver (Exh. EV-1, at 57). Because the installation of this structure could have an insignificant effect on the flood storage volume of the floodplain, according to the Company, the Company indicated that the Project's impacts to the floodplain would be minimized (id.).

Table 3. Wetland Impacts (square feet).

Structure Number	Permanent BVW Impacts	Temporary BVW Construction Mat Work Areas	Temporary BVW Construction Mat Access	Total Temp. BVW Construction Mat Impact
13	30	10,000	3,983	13,983
14	0	2,408	197	2,606
14 (pull pad)	0	8,311	0	8,311
18	0	0	3,051	3,051
29	0	0	481	481
42	0	1,717	0	1,717
43	0	2,348	0	2,348
47	0	4,123	0	4,123
48	0	2,395	0	2,395
TOTAL	30	31,302	7,713	39,015

Source: Exh. EV-1, at 49, table 10.

Eversource stated that Project construction would require the following permit authorizations: Sections 401 and 404 of the Federal Clean Water Act and the Massachusetts Department of Environmental Protection's ("MassDEP") regulations at 314 CMR 9.00 regarding discharge of dredge or fill material into Waters of the Commonwealth; Massachusetts Wetlands Protection Act (G.L. c. 131 § 40 and associated regulations at 310 CMR 10.00); and local wetland bylaws in Carver, Plympton, and Kingston (Exhs. DPU-W-3; DPU-W-5, DPU-W-7; DPU-W-8; DPU-W-10; Tr. 1, at 135-136, 138-140). Finally, Eversource would obtain coverage under the National Pollutant Discharge Elimination System ("NPDES") General Permit for Discharges from Construction Activities for stormwater discharges during construction and develop a Stormwater Pollution Prevention Plan ("SWPPP") (Exhs. EV-1, at 60-61; DPU-W-9; Tr. 1, at 124-130).

Eversource noted there is a certified vernal pool outside the right-of-way near Center Street in Carver (Exh. EV-1, at 58). According to the Company, the vernal pool is far enough outside the right-of-way that special protective measures are not required (Tr. 1, at 134).

The Company stated that it would install ten proposed structures, located between Brook Street in Plympton and Wapping Road in Kingston, within a Zone II wellhead protection area (Exh. EV-1. at 49). Eversource explained that it implements more stringent best management practices for construction in wellhead protection areas, such as ensuring there is no refueling of vehicles within these wellhead buffers (Tr. 1, at 140). Eversource reported that there are no Outstanding Resource Waters, Areas of Critical Environmental Concern, Surface Water Protection Areas, or MassDEP Zone I wellhead protection areas within the vicinity of the Project (Exh. EV-1, at 49).

e. Traffic

The Company explained that the Project would have minimal impacts to local traffic because it will be installed in an existing right-of-way, and that the volume of traffic generated during construction is not expected to significantly affect traffic flow on public ways along the Project route (Exh. EV-1, at 53). However, Eversource indicated that there may be temporary traffic impacts due to construction such as temporary road closures; the Company committed to scheduling any road closures during off-peak hours in consultation with the relevant municipality (id.; Tr. 1, at 100-101). The Company would obtain grants of location from the Select Boards of Carver, Plympton, and Kingston for roadway crossings

along the Project, and would develop traffic management plans as required by each municipality (Exh. DPU-G-10; Tr. 1, at 103-105).

Eversource stated that any temporary impacts associated with the conductor stringing across public roadways would be minimal (Exh. EV-1, at 53). The Company noted, however, that stringing conductors across U.S. Route 44 would require approval from Massachusetts Department of Transportation ("MassDOT") via a State Access Highway Permit approval (id. at 54; Tr. 1, at 110). The Company stated that it would not pull wires across live traffic and, therefore, would need to periodically stop traffic on Route 44 to complete conductor stringing across the highway (Tr. 1, at 112). Eversource would also develop a traffic management plan as part of its State Highway Access Permit (id. at 109-110). The Company expects that MassDOT would allow traffic on Route 44 to be stopped for only five-minutes at a time; and it expects that this restriction would be in the MassDOT permit (id. at 110). Eversource indicated its traffic management plan would also describe the use of appropriate signage and traffic control devices (id.).

The Company explained that construction of the underground segment of the New Line across Brook Street may require temporary road closure and traffic detour on off-peak hours (Exh. DPU-T-1; Tr. 1, at 100-101). Eversource anticipates that construction beneath Brook Street would take approximately 10 to 15 days (Tr. 1, at 103). The Company stated it would obtain a street opening permit from the Town of Plympton for this crossing (id. at 105-106; RR-DPU-8).

The Company stated that stringing wires across the Massachusetts Bay Transportation Authority ("MBTA") commuter rail Kingston Branch would require a "License for Entry" from the MBTA (Exh. EV-1, at 61; Tr. 1, at 117). Eversource stated it would time the aerial crossing according to the MBTA requirements and that it expects to pull wire when trains are not coming or going from the station (Tr. 1, at 118). The Company does not anticipate any commuter rail schedule disruptions or delays as a result of the crossing (id.; Exh. DPU-T-6).

f. Noise

Eversource noted that no permanent noise-generating equipment would be installed as part of the Project, and that all noise impacts related to the Project would be temporary in nature and related to construction (Exh. EV-1, at 51). The Company explained that construction noise at any specific location would be brief and intermittent along the Project right-of-way (id.). Eversource stated that it expects sound levels associated with cable pulling to be between 70 and 94 A-weighted decibels ("dBA") at a distance of 50 feet (Tr. 1, at 94). Table 4 summarizes expected noise levels at distance of 50 feet for equipment that Eversource expects to use during Project construction (Exh. EV-1, at 51).

Table 4. Noise Ranges of Typical Construction Equipment.

Equipment	Levels (Leq dBA) at 50 feet
Backhoe	73-95
Compressors	85-87
Concrete mixers	75-88
Concrete pumps	81-55
Cranes (moveable)	75-88
Cranes (derrick)	86-89
Front loader	73-86
Generators	71-83
Jackhammers	81-98
Paver	85-88
Pile Driving (peaks)	95-107
Pneumatic Impact Equipment	83-88
Pumps	68-72
Saws	72-82
Scraper/grader	80-93
Tractor	77-98
Trucks	82-95
Vibrator	68-82

Source: Exh. EV-1, at 52, table 11

As stated above, the Company expects construction work hours would generally be between 7:00 a.m. and 7:00 p.m., Monday through Saturday, for approximately ten months (Exh. EV-1, at 47). Eversource committed to providing a Project hotline and website (available 24-hours a day) for any complaints, questions, or concerns about noise or other issues; the Company intends to respond to such communications in a timely manner, usually within 24 to 48 hours (Exh. DPU-NO-10).

Eversource stated that it would determine specific work hours, including potential weekend work, in coordination with local authorities (Exh. EV-1, at 51). Eversource noted that some construction activities, such as pouring concrete foundations and conductor pulling, cannot be interrupted until they are completed (id.). When undertaking such activities,

Eversource may seek approval from the municipalities to work at nights or on weekends (id.). Eversource stated that the Towns of Carver, Kingston, and Plympton do not have specific regulations limiting noise in their respective bylaws (id.).

g. Air, Safety, Hazardous Waste and Solid Waste

Eversource indicated that the main sources of potential construction-related air quality impacts would be diesel-powered construction equipment, other motor vehicles, and dust from disturbed soil surface areas (Exh. EV-1, at 52). The Company stated its work crews would follow best management practices for construction to minimize such emissions (id. at 53). The Company committed to use U.S. Environmental Protection Agency-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies, in all diesel-powered non-road construction equipment rated 50 horsepower or above that would be used for 30 or more days over the course of the Project (id.). Eversource stated that it would control dust at construction sites using appropriate best management practices, such as maintaining reasonable construction vehicle speeds during dry conditions and applying water where necessary (id.).

Regarding safety, Eversource stated that it would construct the New Line and substation modifications in accordance with relevant industry standards including, but not limited to, American National Standards Institute ("ANSI") standards, the Occupational Safety and Health Act ("OSHA"), the National Electrical Safety Code, and 220 CMR 125, "Installation and Maintenance of Electric Transmission Lines" (Exh. EV-1, at 53). The Company noted each of its contractors will be contractually required to provide a Project

Safety Plan that meets the Company's safety requirements as well as those of all applicable regulatory agencies (Exh. DPU-S-1). Eversource stated the construction workers must follow all safety protocols applicable to the work, such as scheduled safety meetings, pre-work briefings, insulation and isolation of electrical equipment, and sheeting of excavations (Exh. EV-1, at 53).

The Company stated it reviewed the MassDEP reportable release database to determine the potential for encountering contaminated soils during Project construction (Exh. EV-1, at 59). Eversource did not identify any sites of known contamination within the right-of-way (id.). In the event that contaminated soil or groundwater is encountered during construction, the Company would notify MassDEP before contacting a licensed site professional for cleanup (Exh. DPU-HW-2; Tr. 1, at 120, 146). Eversource explained that vehicle re-fueling will be conducted outside of wetland resource areas and buffer zones and any drinking water supply protection area (Exh. EV-1, at 49-50). Fixed equipment, like cranes, drill rigs, excavators would be refueled, as necessary, on the right-of-way (id.). The Company has a spill response plan in place that it would activate in the unlikely event that construction of the Project results in a spill (Exh. DPU-HW-1). The response, which may involve initially stopping the spill and applying absorbents such as speedy dry and absorbent pads (id.; Tr. 1, at 119).

h. Magnetic Fields

Eversource modeled magnetic field levels associated with the Project under average and peak annual loading conditions (Exh. EV-1, at 54, 56). The Company calculated

magnetic fields using equations from the Electric Power Research Institute, which also recommended calculating magnetic field levels at one meter above ground level (id. at 54). In doing so, the Company stated that it used ISO-NE's base-case system power-flow models representing expected New England transmission topology for 2022 with all lines in service (id.). The Company calculated magnetic field levels at three specific points for each of the three representative sections of the Project (id. at 55-56). Table 5 below summarizes the results of the Company's magnetic field modeling.

Table 5. Calculated Magnetic Field Levels for 2022 Loads, in milligauss ("mG").

Load Scenario	Section of ROW	Configuration	Magnetic Field West Edge of ROW	Magnetic Field Maximum within ROW	Magnetic Field East Edge of ROW
Annual Average 2022 Load	Carver SS to Spring Street SS	Existing:	6.3	74.8	46.7
		Proposed:	10.5	57.3	29.8
	Spring Street SS to Brook St. SS	Existing:	5.9	74.9	46.7
		Proposed:	6.6	33.8	6
	Brook St. SS to Kingston SS	Existing:	6.7	46.7	6.4
		Proposed:	2.9	29	14.9
Annual Peak 2022 Load	Carver SS to Spring Street SS	Existing:	8.6	100.9	63
		Proposed:	14.3	78.8	40.1
	Spring Street SS to Brook St. SS	Existing:	7.6	101	62.9
		Proposed:	8.3	74.4	41.3
	Brook St. SS to Kingston SS	Existing:	10.3	67.2	9.3
		Proposed:	4.5	38.6	19.9

Source: Exh. EV-1, at 55-56; Tr. 2, at 344-345.

The Company observed that in most locations along the right-of-way, exposures to magnetic fields are reduced relative to magnetic fields from the existing transmission and

distribution lines for 2022 (Exh. EV-1, at 57; Company Brief at 63). The Company reported that its calculated magnetic field levels are all significantly lower than published international guidelines, ICNIRP [International Commission on Non-Ionizing Radiation Protection] and ICES [International Commission on Electromagnetic Safety], which are 2,000 mG and 9,040 mG, respectively (Exh. EV-1, at 56, 57; Tr. 2, at 347; Company Brief at 63).

The Company also calculated magnetic field levels for the relatively short segment of underground transmission line in the vicinity of the Brook Street Substation (Exh. DPU-MF-4). The Company selected its transmission line phasing to optimize magnetic field reduction on the west side of the right-of-way because there are more homes on that side (Exh. DPU-MF-3; Tr. 2, at 348-349). The Company asserted that the underground cable arrangement would minimize magnetic fields, which attenuate to annual average values less than 1 mG beyond a distance of 13 feet away from the duct bank of the transmission line (Exh. DPU-MF-4).

i. Analysis and Findings

The Company would construct an approximately eight-mile-long new overhead transmission line on 63 new structures within an existing right-of-way, with existing overhead transmission and distribution lines (Exh. EV-1, at 48). The record shows that the Project would have no permanent effect on existing, adjacent land uses along the Project route and no new permanent property rights are required for construction or operation of the Project (id.; Exh. DPU-LU-5).

The record also shows that the Project is in the vicinity of habitats for the eastern box turtle, Plymouth redbelly turtle, and northern long-eared bat; however, the Project is unlikely to result in a "take" of these species (Exhs. EV-1, at 58; DPU-LU-18; Tr. 1, at 65-68). The Company will consult with federal and state agencies to minimize potential impacts to these habitat areas (Exh. EV-1, at 58; Tr. 1, at 65). No further archaeological investigation is recommended for the Project (RR-DPU-3(S1)(1)).

The Project would be constructed on a fully maintained right-of way and result in limited change in views of the right-of-way from abutting properties as a result of the new structures (Exh. EV-1, at 50). Depending on the location and heights of the structures within the right-of-way, Eversource would implement different strategies to mitigate the visual impacts of the new structures (id.). The structures proposed for Segments I and II, between Carver Substation and Brook Street Substation, would generally be shorter than the existing structures and use the same finish (Exh. DPU-V-1(1)). From Brook Street Substation onwards, the new structures are taller but would have weathering-steel finishes to better fit in with the wooden structures of existing lines in the right-of-way (Exh. EV-1, at 56). The record also shows that Eversource proposes to group new structures with existing structures by installing them in-line with one another (id. at 50; Exh. DPU-V-1; Tr. 1, at 90). The Department finds that matching the finish of existing, adjacent transmission structures and positioning new structures in-line with existing structures minimizes the visual impacts associated with the proposed transmission structures.

Eversource presented a design variation in connection with Structure 44, which is taller than structures in the area and is in the vicinity of a residential property, that would reduce the height of Structure 44 by 15 feet but would require an additional, intermediate transmission structure, which has an estimated cost of $154,000 (RR-DPU-7(S1)). The Department finds that reducing the height of Structure 44 by fifteen feet is not warranted considering potential visual impacts of adding an additional transmission structure in a relatively open, residential area.

The record shows that Eversource intends to clear several trees within the right-of-way and clear certain trees outside of the right-of-way to protect transmission lines (Exh. DPU-LU-8). The removal of trees would likely contribute to a change in the appearance of the right-of-way, especially where trees currently exist between abutters and the New Line (Exhs. DPU-V-3; DPU-V-5). Prior to construction, the Department directs the Company to notify by direct mail or hand-delivery all property owners with residential structures within 300 feet of any tree clearing. Where Eversource would remove such trees, the Company shall offer to those property owners with residential structures within 300 feet of any tree clearing the opportunity to plant replacement vegetation that is compatible with the Company's VMP and provides some visual screening from the New Line.

The Project would have temporary and permanent impacts in wetland resource areas (Exh. EV-1, at 48). Setting up a temporary work area, using construction matting, would create temporary impacts to BVW; installing one structure (Structure 13) within a wetland resource area would result in a permanent wetland impact in Carver (id. at 49). The record

shows that the Company will mitigate the 30 square feet of permanent impact at Structure 13 by developing a wetland replication plan that is acceptable to the Carver Conservation Commission (Exh. DPU-W-6). Project construction is not likely to affect vernal pools identified outside of the right-of-way (Tr. 1, at 134). The record shows that the Company plans to implement more stringent best management practices for construction within buffer zones to wetland resources and at the ten structures located within a Zone II wellhead protection area (id. at 140; Exh. EV-1, at 49). The Company will work with the Town of Carver through the Notice of Intent process to create an acceptable wetland replication plan (Exh. DPU-W-6).

The record shows that because the New Line will be constructed along an existing right-of-way, traffic impacts associated with the Project, including underground construction across Brook Street, would be minimal (Exhs. EV-1, at 53; DPU-T-1). The record also shows that the Company will work with the Towns of Carver, Kingston, and Plympton to coordinate construction traffic, with MassDOT to permit stringing conductors across interstate Route 44, and with the MBTA for scheduling stringing across the commuter line (Exhs. EV-1, at 53; DPU-T-6; Tr. 1, at 112). The Company would obtain grants of location from the Select Boards of Carver, Plympton, and Kingston for roadway crossings along the Project, and would develop traffic management plans as required by each municipality (Exh. DPU-G-10; Tr. 1, at 103-105).

Project construction would likely cause temporary and intermittent noise impacts at locations along the Project right-of-way corresponding to new transmission line structures

throughout the construction period (Exh. EV-1, at 51). Nonetheless, there are certain activities, such as concrete pouring, that might require work outside of the Company's typical hours (id.). The record shows that the Company will work with the three affected municipalities with respect to construction hours to minimize these noise impacts and maintain a hotline and website to handle any complaints (id. at 10).

To avoid disturbance during evening hours, the Department directs the Company to limit construction its proposed schedule of Monday through Saturday from 7:00 a.m. to 7:00 p.m. 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 work beyond such times), the Company is directed to seek written permission from the Towns of Carver, Kingston, and Plympton prior to the commencement of such work and to provide the Department with a copy of such permission. If the Company and the Towns are not able to agree on extended construction hours, the Company may request prior authorization from the Department and shall provide the affected Town or Towns with a copy of any such request.

The Company shall inform the Department and the relevant municipal authorities in writing within 72 hours of any work that continues beyond the hours allowed by the Department or, if granted extended work hours in writing by the Towns of Carver, Kingston or Plympton, work that continues past the authorized extended hours. The Company shall also send a copy to the Department of any authorization for an extension of work hours within 72 hours of its receipt. Furthermore, the Company shall keep a record of the dates, times, locations, and durations of all instances in which work continues beyond the hours

allowed by the Department, or, if granted extended work hours in writing by the Towns of Carver, Kingston, and Plympton, work that continues past the extended hours allowed, and must submit such record to the Department within 90 days of Project completion.

The main sources of construction-related emissions are the construction equipment, motor vehicles, and dust from disturbed soil surface areas (Exh. EV-1, at 52). The record shows that Eversource would employ best management practices to minimize fugitive dust emissions (e.g., maintaining reasonable vehicle speeds during dry conditions, applying water where necessary) (id. at 53).

Eversource modeled magnetic field levels associated with the Project under average and peak annual loading conditions (Exh. EV-1, at 54, 56). The Company selected its transmission line phasing to optimize magnetic field reduction on the west side of the right-of-way because there are more homes on that side (Exh. DPU-MF-3; Tr. 2, at 348-349). Tabulation of modeled magnetic field impacts shows that maximum magnetic field levels within the right-of-way would decrease as a result of the Project (Exh. EV-1, at 57). At the edge of the right of way, magnetic field levels may increase or decrease somewhat along particular segments of the right-of-way way, and levels will further diminish with distance from the edge of the right-of-way (id. at 54-57). The Company also maintained that the magnetic field of the segment of underground transmission line near Brook Street Substation would be minimized by close arrangement of the line phases (Exh. DPU-MF-4). The predicted magnetic field values are generally consistent with levels in projects previously approved by the Department. See NSTAR Electric Company d/b/a Eversource Energy,

D.P.U. 18-21 (2019); New England Power Company d/b/a National Grid, D.P.U. 14-128/14-129 (2015); NSTAR Electric Company, D.P.U. 14-08 (2015).

Finally, to ensure that information about construction and operation of the Project is disseminated widely within the community, the Department directs the Company, in consultation with the Towns of Carver, Kingston, and Plympton, to develop a community outreach plan for Project construction and operation. The outreach plan should, at a minimum, lay out procedures for providing prior notification to affected residents of the following: (1) the scheduled start, duration, and hours of construction; (2) any construction that must take place outside the normal hours or days indicated above; (3) any operation the Company intends to conduct that could result in unexpected community impacts due to unusual circumstances; and (4) complaint and response procedures, including contact information.

The Department concludes that the impacts of the Project will be minimized by the Project's compliance with (1) all applicable federal, state, and local laws and regulations; (2) the avoidance, minimization, and mitigation measures that Eversource has stated it will implement during Project construction; and (3) the Department's conditions as discussed above and set forth below.

C. Conclusion on Public Convenience and Public Interest

Based on the foregoing analysis of (1) the need for or public benefit of the proposed use; (2) alternatives explored; and (3) impacts of the proposed use, the Department finds that the Project is necessary for the purpose alleged, that the benefits of the Project to the general

public exceed the local impacts, and that the Project will serve the public convenience and is consistent with the public interest.

III. 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" ("Section 61 findings"). G.L. c. 30, § 61. Pursuant to 301 CMR 11.01(3), Section 61 findings are necessary when an Environmental Impact Report ("EIR") is submitted to the Secretary of Energy and Environmental Affairs ("Secretary") and should be based on such EIR. Where an EIR is not required, Section 61 findings are not necessary. 301 CMR 11.01(3).

On September 13, 2019, the Company submitted an Environmental Notification Form ("ENF") pursuant to MEPA and its regulations at 301 CMR 11.00 et seq. (Exh. EV-1, at 60). On October 25, 2019, the Secretary issued a Certificate on the ENF (id.). The ENF and the Certificate were included as part of the Petition (id. at 60, app. N, app. O). In the Certificate, the Secretary determined that the Company would not be required to file an EIR (id., app. O at 5). Accordingly, it is not necessary to make Section 61 findings for this Project.

IV. ORDER

Accordingly, after due notice, hearing, and consideration, it is hereby

ORDERED: That the petition of Eversource seeking approval to construct and operate a transmission line pursuant to G.L. c. 164, § 72, is granted; and it is

FURTHER ORDERED: That Eversource, prior to construction, notify by direct mail or hand-delivery all property owners with residential structures within 300 feet of any tree clearing. Where Eversource removes such trees, the Company shall offer to those property owners with residential structures within 300 feet of any tree clearing the opportunity to plant replacement vegetation that is compatible with the Company's VMP and provides some visual screening from the New Line; and it is

FURTHER ORDERED: That Eversource limit construction to its proposed schedule of Monday through Saturday from 7:00 a.m. to 7:00 p.m. 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 work beyond such times), Eversource is directed to seek written permission from the Towns of Carver, Kingston, and Plympton prior to the commencement of such work and to provide the Department with a copy of such permission. If the Company and Towns are not able to agree on such extended construction hours, Eversource may request prior authorization from the Department and provide the Towns with a copy of such request; and it is

FURTHER ORDERED: That Eversource shall inform the Department and the Towns of Carver, Kingston, and Plympton in writing within 72 hours of any work that continues beyond the hours allowed by the Department or, if granted extended work hours in writing by the Towns of Carver, Kingston, and Plympton, work that continues past the hours allowed. The Company shall also send a copy to the Department of any authorization for an extension of work hours within 72 hours of its receipt. Furthermore, the Company shall

keep a record of the dates, times, locations, and durations of all instances in which work continues beyond the hours allowed by the Department, or, if granted extended work hours in writing by the Towns of Carver, Kingston and Plympton, work that continues past the hours allowed, and must submit such record to the Department within 90 days of Project completion; and it is

FURTHER ORDERED: That Eversource and its contractors and subcontractors comply with all applicable federal, state and local laws, regulations, and ordinances; and it is

FURTHER ORDERED: That Eversource obtain all other governmental approvals necessary for the Project; and it is

FURTHER ORDERED: That Eversource and its successors in interest shall notify the Department of any changes other than minor variations to the Project so that the Department may decide whether to inquire further into a particular change; and it is

FURTHER ORDERED: That within 90 days of Project completion, Eversource shall submit a report to the Department documenting compliance with all conditions contained in this Order, noting any outstanding conditions yet to be satisfied and the expected date and status of such resolution; and it is

FURTHER ORDERED: That Eversource, in consultation with the Towns of Carver, Kingston, and Plympton, develop a community outreach plan for Project construction and operation. The outreach plan should, at a minimum, lay out procedures for providing prior notification to affected residents of the following: (1) the scheduled start, duration, and hours of construction; (2) any construction that must take place outside the normal hours or days

indicated above; (3) any operation the Company intends to conduct that could result in unexpected community impacts due to unusual circumstances; and (4) complaint and response procedures, including contact information; and it is

FURTHER ORDERED: That because the issues addressed in this Order relative to this Project are subject to change over time, construction of the Project must commence within three years of the date of this Order; and it is

FURTHER ORDERED: That Eversource and its successors in interest shall comply with all other directives contained in the Order; and it is

FURTHER ORDERED: That the Secretary of the Department transmit a certified copy of this Order to the town managers of Carver, Kingston, and Plympton, and that the Company serve a copy of this Order on the Carver, Kingston, and Plympton Select Boards and the Carver, Kingston, and Plympton Departments of Public Works within five business days of its issuance and certify to the Secretary of the Department within ten business days of its issuance that such service has been accomplished.

By Order of the Department:

Matthew H. Nelson, Chair

Robert Hayden, Commissioner

Cecile M. Fraser, Commissioner

An appeal as to matters of law from any final decision, order or ruling of the Commission 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 Commission be modified or set aside in whole or in part. Such petition for appeal shall be filed with the Secretary of the Commission within twenty days after the date of service of the decision, order or ruling of the Commission, or within such further time as the Commission 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. G.L. c. 25, § 5.