The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

D.P.U. 10-77 May 6, 2011

Petition of New England Power Company d/b/a National Grid pursuant to G.L. c. 164, § 72, for approval to construct and operate a 115 kV transmission line in the Towns of Easton and Mansfield.

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I. INTRODUCTION

A. Project Description

On August 2, 2010, New England Power Company, d/b/a National Grid ("NEP" or the "Company"), filed a petition with the Department of Public Utilities ("Department") pursuant to G.L. c. 164, § 72, seeking approval to construct and operate a four-mile overhead 115 kilovolt ("kV") electric transmission line on existing transmission structures within an existing right-of-way ("ROW") in the towns of Easton and Mansfield, Massachusetts (the "Project").

The proposed 115 kV transmission line, to be known as the A24 Line ("A24 Line" or the "Project") would extend from NEP's existing Easton No. 92 Substation in Easton ("Easton Substation") to a proposed substation off Bird Road in Mansfield ("Bird Road Substation") to be built by the Mansfield Municipal Electric Department ("MMED") (Exh. NG-MB at 3). The Company described the A24 Line to be built of 795 ACSR "Drake" conductor with a capacity of 235 MVA for summer normal rating and a capacity of 290 MVA for summer long-time emergency rating (Exh. DPU-G-3). The A24 Line would be constructed in an existing ROW approximately 300 feet in width, currently occupied by two transmission lines: (1) the 345 kV 344 Line, located on the southerly side of the ROW on double-circuit, steel lattice towers ("344 Line"); and (2) the 345 kV 331 Line, located on the northerly side of the ROW on single-circuit poles ("331 Line") (Exh. NG-MB at 4).[1] The A24 Line would be co-located

[1] The 344 and 331 Lines are part of the 345 kV system connecting central Massachusetts with an area of southeastern Massachusetts (known as "lower SEMA") (Exh. NG-JFH at 3). The lines share a ROW from Bridgewater to Walpole Junction in Walpole, Massachusetts (id.).

in the vacant position on existing double-circuit towers with the 344 Line (id. at 3). The A24 Line would be an extension of NEP's 115 kV E1 transmission line ("E1 Line") that connects the Wareham, Bridgewater and Easton Substations, but the Company would sectionalize the E1 Line at the Bridgewater Substation (Exh. NG-JFH at 3, 4). This includes dividing the E1 Line at the Bridgewater Substation into two independent line sections by adding two circuit breakers and associated equipment to expand the connection to a breaker-and-a-half arrangement (Exh. NG-JWM-3, at 2).[2] The A24 Line will have a load break switch installed outside the Easton Substation to sectionalize the line to allow the E1 Line from the Bridgewater Substation to the Easton Substation to remain energized and serving the Easton Substation load in the event that the A24 Line is taken out of service for maintenance or repairs (Exh. DPU-G-8).

The Company asserted that the A24 Line is needed as a source of transmission supply to the Bird Road Substation, which is to be constructed by MMED to supplement MMED's distribution system, in order to address existing reliability and operational concerns and meet forecasted demand growth (Exhs. NG-JWM, at 4; NG-MDS; NG-AMR).

B. Procedural History

On August 2, 2010, NEP submitted a petition pursuant to G.L. c. 164, § 72, to the Department. In support of its petition, the Company presented the prefiled testimony of the following witnesses: (1) Marc Bristol, Project Manager, National Grid, regarding project overview, project and route alternatives, project construction, costs and outreach;

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[2] The Company expects permitting for the Bridgewater Substation upgrades related to the A24 Line to be completed by February 2011 with construction from April 2011 through October 2011 (Exh. DPU-G-5).

(2) John W. Martin, Transmission Planning Engineer, National Grid, concerning the need for the A24 Line; (3) James F. Hannigan, Transmission Line Engineer, National Grid, concerning the project design; (4) Allan M. Rice, Engineer, PLM, Inc., regarding the need for the Bird Road Substation and Project alternatives; (5) Mayhew D. Seavey, Jr., Engineer, PLM, Inc., concerning the need for the Bird Road Substation; (6) Gary Babin, Director of the MMED, regarding the Bird Road Substation; (7) Andrea M. Desilets, Environmental Engineer, National Grid, regarding environmental impacts and permitting; and (8) Peter A. Valberg, Ph.D., Principal, Gradient Corporation, addressing electric and magnetic field ("EMF") impacts.

The Department conducted a site visit on September 14, 2010, and, pursuant to a Notice of Filing and Public Hearing, conducted a public hearing on October 5, 2010. On October 15, 2010, MMED filed a petition to intervene. On October 19, 2010, Allen and Deborah Dunne Rogers ("the Rogers") filed a petition to intervene. On October 26, 2010, the Department granted intervenor status to both MMED and the Rogers.

The Company responded to information requests issued by the Department and the Rogers. MMED also responded to information requests issued by the Rogers. On December 17, 2010, the Rogers submitted pre-filed testimony. On January 20, 2011, the Department conducted an evidentiary hearing and issued five record requests to the Company, which the Company answered on February 3, 2011. The Department admitted more than 200 exhibits into evidence. On February 17, 2011, the Company, MMED and the Rogers submitted their respective initial briefs. On March 3, 2011, the Company and the Rogers filed reply briefs.

II. STANDARD OF REVIEW

G.L. 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.[3]

The Department, in making a determination under G.L. c. 164, § 72, is to consider all aspects of the public interest. Boston Edison Company v. Town of Sudbury, 356 Mass. 406, 419 (1969). Section 72, for example, permits the Department to prescribe reasonable conditions for the protection of the public safety. Id. at 419-420. All factors affecting any phase of the public interest and public convenience must be weighed fairly by the Department in a determination under G.L. c. 164, § 72. Town of Sudbury v. Department of Public Utilities, 343 Mass. 428, 430 (1962).

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 (see Massachusetts Electric Company, D.P.U. 93-29/30, at 10-14, 22-23 (1995); New England Power Company,

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[3] 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 the Department requires. The Department finds that the Company complied with these requirements.

D.P.U. 92-278/279/280, at 19-22 (1994) ("NEPCo, D.P.U. 92-278/279/280"); Tennessee Gas Pipeline Company, D.P.U. 85-207, at 6-9 (1986) ("Tennessee")); (2) the environmental impacts or any other impacts of the present or proposed use (see NEPCo, D.P.U. 92-278/279/280, at 20-23; New England Power Company, D.P.U. 92-270, at 17-20 (1994) ("NEPCo, D.P.U. 92-270"); Tennessee, at 20-25); and (3) the present or proposed use and any alternatives identified (see NEPCo, D.P.U. 92-278/279/280, at 19; NEPCo, D.P.U. 92-270, at 17; Tennessee, at 18-20). 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. NEP is an electric company as defined by G.L. c. 164, § 1. New England Power Company d/b/a National Grid, D.T.E. 04-4, at 8 (2004). Accordingly, the Company is authorized to petition the Department for a determination under G.L. c. 164, § 72, that its proposed transmission line is necessary for the purpose alleged, will serve the public convenience, and is consistent with the public interest.

III. DESCRIPTION, ANALYSIS AND FINDINGS

A. Need for or Public Benefit of Use

Presently, all MMED customers are served solely by the existing Gilbert Street Substation located in the southwestern corner of Mansfield (Exh. NG-AMR at 4). MMED identified a need for a second substation to serve as an additional point of supply to its distribution system as described in Sections III.A.1 and III.A.2, below (Exh. NG-MDS at 2). The three primary reasons why MMED requires a new substation as a source of supply are:

(1) to address existing capacity and operational issues within the distribution system; (2) to maintain reliability in contingency situations; and (3) to meet projected growth in peak demand (Exh. NG-MDS at 2-3). In order to provide the needed supply to the Bird Road Substation, NEP is proposing to construct the A24 Line from the Easton Substation to the Bird Road Substation (Exh. NG-MDS at 2).

1. Description of MMED's Existing Distribution System

The Gilbert Street Substation receives 115 kV supply via NEP's C-181 and D-182 Lines originating from Brayton Point Station in Somerset (Exh. NG-AMR at 4). The municipally-owned radial taps extend off of the C-181 and D-182 Lines from the NEP ROW to the Gilbert Street Substation (id.). The Gilbert Street Substation consists of four 115 kV-to-13.8 kV transformers, four 13.8 kV buses, and eight individually-regulated 13.8 kV feeder positions (id.).[4]

[4] At the Gilbert Street Substation, Buses Nos. 1 and 2 are supplied by Transformers Nos. 1 and 2, respectively, each with a nameplate rating of 23.5 MVA (Exh. NG-AMR at 5). In turn, Buses Nos. 1 and 2 supply feeders 1W1, 1W2, 1W3 and 1W4 (id.). Buses Nos. 3 and 4 are supplied by Transformers Nos. 3 and 4, respectively, each with a nameplate rating of 40 MVA (id.). In turn, Buses Nos. 3 and 4 supply feeders 1W5, 1W6, 1W7 and 1W8 (id.). The feeders that are normally supplied by each 13.8 kV bus are programmed to automatically transfer to another bus upon the loss of a transformer or one of the 115 kV transmission lines (id. at 4).

i. Capacity and Operational Issues at the Gilbert Street Substation

MMED asserted that its system load is approaching the firm capacity rating of the Gilbert Street Substation, which is 63.5 megavolt-amperes ("MVA") (Exh. NG-AMR at 2).[5] MMED further argued that the usable capacity of the distribution system may be somewhat less than the 63.5 MVA because (1) there are only a limited number of available circuit route and switching points; and (2) it is not feasible to load each feeder to 100 percent of its capability (id. at 2-3). According to MMED, several major system components, including Transformers Nos. 1 and 2 and one of the feeders have reached, or will shortly reach, their thermal limits based on the current system configuration (id.). MMED indicated that significant new load was added in 2008 and as a result, the load on Transformers Nos. 1 and 2 will be in excess of the firm rating for loss of either transformer, which would render both transformers inoperative, requiring the other two transformers, Nos. 3 and 4, to supply the entire load for MMED's customers (Exh. NG-AMR at 6; Tr. at 19). Prior to the addition of

[5] For this analysis, MMED determined that the fast firm capability (i.e., immediate ability to restore load via a predetermined automated switching sequence taking less than a minute) of the Gilbert Street Substation is 63.5 MVA, derived by adding the fast firm capability of the equipment that supplies the first set of four feeders, which is the 23.5 MVA rating of the 115 kV-to-13.8 kV Transformers No. 1 and 2, and the fast firm capability of the equipment that supplies the second set of four feeders, which is the 40 MVA rating of the 115 kV-to-13.8 kV Transformers No. 3 and 4 (Exh. NG-AMR at 5). MMED explained that the capacity is based on the MVA rating of the substation transformers (which would be the limiting component) and the rating is determined by taking the available capacity in the event of the contingency loss of one of the two 115 kV supply lines that would render two of the four transformers inoperative, requiring the other two transformers to supply MMED's entire load (Tr. at 19).

new load in 2008, the load on Transformer Nos. 1 and 2 was 22.8 MVA, which is 97 percent of the 23.5 MVA rating (id.).

MMED determined that voltage levels of several distribution circuits are at or exceed utility guidelines for regulated circuits (Exh. NG-AMR at 6). The Gilbert Street Substation has eight distribution circuits and three of these circuits extend into the East Mansfield area (Tr. at 22). MMED indicated that one of the three circuits (i.e., 1W6) extending to the East Mansfield area has already been loaded beyond 100 percent of its normal capability under a summer peak load condition and that the other two circuits are heavily loaded (80 percent and 90 percent under normal system conditions) (id.; Exh. NG-AMR at 7).[6] MMED asserted that short term solutions, such as shifting load to other feeders or constructing new distribution feeders are not feasible, given the remaining capacity of the feeders as well as substation transformer and thermal limitations (Exh. NG-AMR at 6-7). MMED is obligated to maintain voltage levels on its feeders within industry accepted limits (i.e., within five percent of the nominal target voltage) (Exh. NG-AMR at 6). The combination of load level and length of feeder circuits supplying East Mansfield is making it increasingly difficult for MMED to operate within industry limits (id.). In 2010, MMED installed pole-mounted voltage regulators as an interim solution, but MMED argued that this approach has limitations, particularly

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[6] The predicted voltage performance of the 1W6 circuit was analyzed using a detailed computer model of the MMED distribution system based on system peak demand load conditions, with all equipment in service (Exh. DPU-N-16). MMED found the voltage regulation to be inadequate (id.).

during abnormal system conditions (e.g., sustained loss of an East Mansfield feeder) (id. at 7; Tr. at 26).

According to MMED, another aspect of the existing distribution system is resistance energy loss (i.e., I^2R losses) on the feeders that supply East Mansfield due to their length and high loading (Exh. NG-AMR at 7). MMED estimated that with the construction of the Bird Road Substation in East Mansfield, the losses on the distribution system would be reduced by up to 1194 kW, with an estimated annual savings for MMED's customers of $325,000 in the first year (id.).[7]

ii. Contingency Situations

MMED's consultant analyzed contingency situations for the Gilbert Street Substation and found that, if there were a sustained loss of any major components of the substation including a 115 kV transmission line, buses, or Transformers Nos. 1 or 2, manual switching could restore additional capacity (or rebalance feeder position loads within capabilities of remaining unaffected equipment) (Exh. NG-AMR at 6; Tr. at 28). However, MMED's consultant recommended that there be fast firm capability to ensure reliability for MMED's customers (Exh. NG-AMR at 6).

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[7] According to MMED's consultant, the calculated losses for the new system arrangement (632 kW) were subtracted from the calculated losses for the system as presently configured (1826 kW), which yields 1194 kW of predicted loss savings (Exh. DPU-N-17). In order to reflect the conditions that would be in place when the new substation was operational, these calculations were based on year 2013 system demand load levels (id.). Calculations were based on projected demand costs of $11.55 per kW-month and projected energy costs of $64 per MWh (in 2010 dollars) (id.).

MMED indicated that a contingency situation would also exacerbate the existing voltage problems arising on the MMED distribution system due to heavy loading and the length of the feeder circuits that serve East Mansfield (Tr. at 20). Voltage decreases as a function of length of the circuit, so, according to MMED, voltage at the end of the circuit in East Mansfield would be less than the industry accepted standards and would be inadequate for customers (id. at 21). MMED asserted that "prudent utility design" requires that the distribution system be designed so that a significant interruption is either prevented or limited to a very short duration (Tr. at 27).

2. Projected Growth in Peak Demand

MMED indicated that Mansfield has undergone significant growth since the 1970's due to its proximity to commuter rail service to Boston and the development of an industrial park (Exh. DPU-N-10). In 2007, the opening of a shopping center called Mansfield Crossing added 29 retail spaces and several restaurants (id.). In addition, downtown Mansfield is experiencing a shift from primarily commercial use to mixed use comprised of both residential and commercial development (id.). Presently, in the downtown area, residential development is strong (id.). However, there is significant vacant commercial space in downtown and in the industrial park which creates a potential for future load growth (id.). Once the economy recovers, the time to bring these commercial spaces on-line would be minimal compared to the permitting and construction time required for new commercial buildings (id.). Thus, there is the potential for increased load to materialize quickly (id.). MMED stated that there is

minimal remaining capacity on its distribution system and that it has limited available options to supply large new loads (Exh. DPU-N-6).

MMED's consultant developed an econometric forecast to project kilowatt-hours sold by rate class and peak system demand, using a database of independent variables that have an impact on those forecast outputs (Exh. NG-MDS-2, at 2). MMED's consultant utilized historical and forecast economic data provided by Global Insight to calculate growth trends as part of its forecast, and also included data on average electricity price trends by MMED rate class (id. at 1-2). In addition, forecast variables also included historical and future design weather data,[8] including heating degree days, cooling degree days, and daily maximum temperatures, all collected from the National Weather Service station in Walpole (id. at 4).

The results of the base forecast for the period 2009-2028 projects average annual compound growth in energy requirements of two percent, an annual peak demand growth under normal weather conditions of 3.2 percent and an annual peak demand growth at the 90th percentile of 3.4 percent (id. at 1).[9] Based on the resulting peak demand forecast, it is projected that MMED's peak demand under 90th percentile weather conditions will exceed the

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[8] The forecast of peak demand is based on the resulting energy forecast and incorporates the impact of weather on peak demand (Exh. NG-MDS-2, at 1). This approach allows the forecast to account for the impact of extremes of weather (id.).

[9] The Company asserted that Independent System Operator–New England ("ISO-NE") and the North American Electric Reliability Corporation ("NERC") require utilities to plan to serve peak demand at the 90th percentile to address extreme weather conditions (Exh. NG-MDS-2, at 1). Furthermore, NEP's *Transmission Planning Guide* states that planning should be conservatively based on the extreme weather forecast due to the lead time needed to construct new facilities (Exh. NG-AMR at 3).

total firm capacity of the Gilbert Street Substation by the summer of 2013 (id. at 2). Under average weather conditions (50th percentile), peak demand will exceed total firm capacity by the summer of 2015 (id. at 1-2).

3. MMED's Proposed Bird Road Substation

As part of its analysis, MMED identified five parcels of land as potential sites for a new substation, each located in East Mansfield and in close proximity to the NEP ROW traversing that area (Exh. DPU-A-6). MMED's analysis included site visits and conversations with the owners of several parcels that were deemed to be the most feasible for substation sites (id.).

In support of its focus on siting a new substation in the East Mansfield area, MMED asserted that there are multiple benefits of having a second source of power for its distribution system. MMED indicated that the NEP ROW will provide a supply path that is separate and distinct from that of the transmission source to the Gilbert Street Substation, providing an increased level of security when compared to the existing system, in which both lines to the Gilbert Street Substation share a common ROW (Exh. DPU-N-3). In addition, the new substation will be geographically remote from the Gilbert Street Substation, allowing one substation to remain in service in the event of a catastrophic failure of an entire substation or transmission line source (id.). Another benefit of having a second substation is that MMED will be able to break circuits down into smaller pieces, reducing the number of customers exposed to outages and limiting the magnitude of an outage (Tr. at 30, 31). Furthermore, the 13.8 kV feeders from the new substation will tie into the 13.8 kV feeders at the Gilbert Street

Substation, allowing the movement of larger blocks of load between the substations during contingency situations and maintenance activities (Exh DPU-N-3; Tr. at 29).

To rank the identified sites, MMED conducted a 30-point screening analysis of its identified substation sites, including factors such as access to existing transmission lines, site conditions, site availability, construction cost, environmental concerns, permitting, and local acceptance (Exh. DPU-A-6). The ranking analysis determined that the Bird Road site in Mansfield, owned by NEP and to be leased to MMED, is the most suitable site for the new substation (id.).

MMED indicated that other sites ranked lower than the proposed Bird Road site because of classification as conservation land, excessive land price, or irregular shape or inadequate size of parcel (Exh. DPU-A-6). MMED completed the municipal and state permitting processes for the Bird Road Substation (Exh. DPU-G-4).[10] MMED indicated that construction of the Bird Road Substation will begin with ordering equipment in the Spring of 2011; commencement of site work construction in the Fall of 2011; and equipment installation in the Winter/Spring 2011/2012, with a scheduled in-service date of June of 2012 (id.).

4. Transmission Source to the Bird Road Substation

MMED's need for a new source of supply via a new substation in East Mansfield is the basis for NEP's need to construct the Project (Exh. NG-AMR at 2). Without the proposed

[10] Pursuant to Mansfield's bylaw, MMED successfully completed the Mansfield Municipal Clearing House Review Process, which included Site Plan Review, Mansfield Planning Board approval and approval by the Board of Selectman and Light Commissioners (Exh. DPU-G-4).

transmission line, there would be no means by which to deliver energy from the Bird Road Substation to MMED customers. The A24 Line would provide the power source to the Bird Road Substation so that power could be delivered to MMED customers (Exh. NG-MB at 4). As the electric transmission provider in the area, NEP is obligated to supply transmission service to MMED's proposed Bird Road Substation (Exh. NG-MB at 4).

5. Analysis and Findings

The record demonstrates that the proposed A24 Line is necessary to provide a transmission source to the Bird Road Substation, which is being constructed for the purpose of improving the capacity of the existing distribution system, increasing reliability, serving future demand, and providing economic benefits to MMED's customers by reducing resistance energy losses (Exhs. NG-AMR at 3-4; NG-AMR at 2; NG-MDS at 2-3; NG-AMR at 7).

Accordingly, the Department finds that there is a need for additional energy delivery for Mansfield, and that public benefits would result from the construction and operation of the Project.

B. Alternatives Explored

The Company reviewed available transmission facilities in the area, considered four alternatives to the Project and concluded that the Project meets the identified need at the least cost and with the least environmental impact (Exh. NG-JWM, at 5).

1. Proposed Project

Section I.A provides a physical description of the Project. With respect to cost, the Company stated that the A24 Line will cost approximately $2.4 million, which includes

materials, labor, equipment, permitting, escalation costs, contingency costs and Allowance for Funds Used During Construction (Exhs. NG-MB at 5; NG-MB-2). The Project also includes splitting the E1 Line at the Bridgewater Substation, estimated at $3 million, for a total Project cost of $5.4 million (Exh. NG-JWM at 6).[11]

2. ROW Underground Alternative

The Company considered the alternative of an underground cable, approximately four miles long, within the existing ROW between the Easton Substation and the proposed Bird Road Substation (Exhs. NG-MB at 10; NG-1, at 2). A significant portion of the ROW is wetlands or wetland buffer zones with several vernal pools, streams, brooks and priority habitat located along the route (Exh. NG- MB-3, at 2). Underground construction would require trenching the entire route or using trenchless techniques such as directional drilling, which would create more complex design and construction issues and increase costs (id.). In addition, to allow for ongoing construction and maintenance, it would be necessary to construct a more extensive and permanent access road along the ROW for an underground line compared with an overhead line (id.). The Company estimated the cost of this underground alternative as $35.9 million, including the installation of the underground 115 kV transmission line and riser structures at both the Easton and Bird Road Substations (Exh. DPU-A-8).

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[11] NEP's investment for the A24 Line will be rolled into a Non-Pool Transmission Facility ("PTF") rate base pursuant to Schedule 21-NEP of the ISO Tariff (Exh. DPU-CO-1). MMED will contribute to payment of these costs by paying a non-PTF Demand Charge for its load transmitted over NEP's non-PTF facilities (id.). The upgrades to split the E1 Line at the Bridgewater Substation will be a capital investment classified as PTF, which are recoverable under Section II of ISO-NE's Transmission, Markets and Services Tariff as approved by FERC (Exh. NG-JWM-3, at 1).

The majority of the Company's ROW (60 percent) is comprised of easement interests (Exh. DPU-A-7). The language of the existing easements references an overhead electric corridor (e.g., poles, towers, etc.) but not an "underground" electric system (id.). The Company asserted that obtaining additional ROW rights would substantially increase the cost of the Project and could delay construction until agreements for the requisite rights were obtained from all the affected property owners (id.).

Accordingly, the Company dismissed the ROW underground option due to: (1) the increase in both short and long term impacts to the wetland resources from underground construction; (2) additional environmental impacts from a more extensive access road; (3) challenges associated with obtaining additional property rights for land not owned in fee by the Company; and (4) increased cost ($35.9 million for this alternative compared with $5.4 million for the Project) (Exhs. NG-MB-3, at 2; DPU-A-7).

3. Street Underground Alternative

The Company considered a 4.6-mile underground cable alternative within public streets, exiting the Easton Substation, proceeding onto Cross Street, traveling north on Bay Road, then west on Rockland Street, entering Mansfield on Maple Street, and then turning north on Bird Road into the proposed Bird Road Substation site (Exh. NG-MB-3, at 2). The Company concluded that although this alternative was feasible, there are significant disadvantages, including several small stream crossings, excavation in wetland buffers, temporary traffic and noise impacts during conduit and cable installation, and considerable cost ($36.8 for this alternative compared with $5.4 million for the Project) (Exhs. NG-MB-3, at

2-5; NG-MB at 5; NG-JWM at 6).

4. North Attleboro Alternative

The Company also analyzed a new eight-mile overhead 115 kV line, on new structures within a new right-of-way, from the existing North Attleboro Substation to MMED's proposed Bird Road Substation (Exhs. NG-JWM at 5; NG-JWM-3, at 3). The Company explained that this alternative would require tapping the line at the North Attleboro Substation and adding a three circuit breakers ring bus with associated equipment (Exh. NG-JWM-3, at 3). The Company estimated that this option would cost approximately $20 million, excluding easements (compared to $5.4 million for the Project) (id.; Exhs. NG-MB at 5; NG-JWM at 6; DPU-A-4). This option was analyzed at a high conceptual level but, given the expensive cost estimate, the Company did not pursue this option further (Exh. DPU-A-2). Additionally, this alternative would take significantly longer to design, permit and construct (i.e., 45-57 months) whereas the time to design, permit and construct the Project is approximately 25 months (Exh. DPU-A-3).

5. Tap from Existing 345 kV Line

Pursuant to staff's request, the Company evaluated the merits, in terms of feasibility and cost, of serving the Bird Road Substation from one of the existing 345 kV transmission lines in the ROW adjacent to the Bird Road Substation site (RR-DPU-1). The Company explored two options in this regard. The first option would be to provide service directly from one of the 345 kV lines, which would require establishing a 345 kV ring bus and using a 345-to-13.8 kV transformer to serve MMED's distribution equipment (id.). The Company

determined that this method would be impractical since it would: (1) substantially increase MMED's costs; and (2) not fit within the boundaries of the Bird Road Substation site (id.).

The second option the Company examined was to loop one of the 345 kV lines in and out of a new 345-to-115 kV substation on or near the existing ROW (RR-DPU-1). The required equipment would include a 345 kV ring bus with three 345 kV circuit breakers; a 345-to-115 kV transformer; and a 115 kV switchyard with one 115 kV bus, two 115 kV breakers, and a 115 kV line exit (id.).[12] For this option, the Company calculated the equipment costs to total approximately $24 million for the initial build, based on conceptual estimates with an accuracy level of minus 25 to plus 50 percent (id.).[13] The Company concluded that this option was substantially more expensive ($24 million) than the Project ($5.4 million) (Exh. NG-JWM at 6; RR-DPU-1).

6. Analysis and Findings

The Company considered the Project along with four alternatives. The record shows that the Project, an overhead line that would extend four miles on existing structures within the existing ROW: (1) will meet the need for a transmission source to MMED's proposed Bird Road Substation; (2) will have the fewest environmental impacts; (3) will not require additional

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12 The Company indicated that the 345-to-115 kV substation would be built with future expansion capacity, including provision for a fourth 345 kV circuit breaker, a second 345-to-115 kV transformer, and that the 115 kV switchyard would be designed for an ultimate three bay, breaker-and-half configuration (RR-DPU-1).

13 The conceptual cost estimate did not consider the availability or cost of land for the substation, construction costs for a longer 115 kV line if the site is not adjacent to the Bird Road Substation, permitting or licensing costs (RR-DPU-1).

property rights; and (4) will cost significantly less than the other alternatives (Exh. NG-JWM at 4-6). The record demonstrates that the Company chose the route and configuration that represents the most feasible and prudent design with respect to environmental impacts and cost.

Accordingly, the Department finds that the Company reasonably established that the Project would be preferable to the identified alternatives.

C. Impacts of the Proposed Project

In accordance with its responsibility to undertake a broad and balanced consideration of the general public interest and welfare, the Department examines the impacts associated with the Project to identify significant impacts that may occur during construction and operation.

1. Construction Methodology

Project construction is currently scheduled to begin in November 2011, with an estimated duration of five months (Exhs. DPU-G-10; DPU-G-11). The construction sequence for the installation of the A24 Line entails the following: (1) ROW mowing and vegetation trimming; (2) swamp mat installation for access and conductor pulling; (3) construction of two new transmission structure foundations; (4) installation of insulators and running blocks for pulling rope at each structure; and (5) installation of conductors (Exh. DPU-G-11). Construction will be performed by two in-house crews consisting of ten workers per crew (Exhs. DPU-G-12; DPU-G-13). In addition to the two construction crews, there will be one ten-person crew responsible for the ROW preparation and restoration (id.). Construction crews will use the Easton Substation located at 555 Depot Street for staging, parking, and storage of materials (Exh. DPU-G-14).

2. Land Use

The Company characterized the predominant land uses abutting the ROW as single family residential and open land (Exh. DPU-LU-3). A portion of the Project passes through the southwest section of the Borderland State Park in Easton (Exh. NG-AMD-4). The Company estimated that there are 76 residences and one business within 50 feet of the edge of the ROW in Easton and Mansfield, based on the Company's Geographic Information System analysis (Exh. DPU-LU-1). There are no residences, businesses, or schools located in the ROW (Exh. DPU-LU-2). The Company has on limited occasion permitted certain activities or improvements within the ROW (i.e., wireless telecommunications equipment pursuant to a terminable lease and a private driveway pursuant to an Assent Agreement) (id.). In addition, there are some structures located partially or completely within the ROW (e.g., sheds, a portion of an above-ground pool, sections of fencing) (id.).[14]

The Company conducted community outreach concerning the Project by distributing "fact sheets" in December 2009 to municipal officials in Easton and Mansfield as well as all abutters within 300 feet of the ROW (Exh. NG-MB at 7). On February 25, 2010, the Company held an open house in Easton for abutters and town officials concerning the Project (id.). Further outreach efforts conducted by the Company included a meeting with the Building Inspector in Easton, a meeting with the Building Inspector and Town Manager in

[14] The Company determined that some of these ancillary structures may have been erected prior to the Company's acquisition of the ROW from its predecessor and some may have been erected without the Company's knowledge or consent (Exh. DPU-LU-2).

Mansfield, and a presentation to the Easton Board of Selectmen to discuss the Project and related zoning issues (Exh. NG-MB at 9).

The Company stated that it will maintain communication with town officials and abutters throughout the construction of the Project (id.). NEP stated that its Stakeholder Relations Group will notify the direct abutters via mail, email, telephone and/or door-to-door visits prior to scheduled construction (Exh. DPU-LU-4). If the Company determines that construction work needs to occur outside normal working hours, the Company will notify the affected abutters via mail, email, telephone and/or door to door visits of extended hours and/or weekend work and will address abutters' concerns (id.). The Company also will consult with the individual towns, should work be required during extended hours or during weekends, and will request relief from bylaws if necessary (Tr. at 59).[15] The Company stated that all notifications will occur as soon as is practicable, but typically one to two weeks in advance of construction (Exh. DPU-LU-4).

As a condition imposed by the Easton Conservation Commission pursuant to its Order of Conditions for the Project, the Company is going to repair gates, install bollards and post "No Trespassing" signs on both sides of each street crossing along the ROW, to deter all-terrain vehicle ("ATV") access (Exh. NG-AMD-7, at 17). The Company has been directed by the Easton Conservation Commission to work with Easton's Land Use Agent to conduct an

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[15] The Company is not aware of any noise ordinance in Mansfield. However, Easton has Environmental Performance Standards limiting the hours of vibration and noise (Exh. DPU-NO-5).

outreach session to inform residents that ATV use is not allowed along the ROW and may be a violation of state and local wetland protection statutes (id.).

3. Visual Impacts

a. Substations

As part of the Project, the Company will install two new structures: one at the Easton Substation and the second at MMED's proposed Bird Road Substation (Exh. NG-JFH at 4-5). Outside of the Easton Substation, a new H-frame style structure approximately 60 feet in height will be built with two steel poles jointed by a steel cross arm (Exh. NG-JFH at 5). Each of the two steel poles of the H-frame structure will be installed on steel-reinforced concrete foundations (id.). The closest residence to the proposed transmission structure is approximately 350 feet (Exh. DPU-V-6(1)).

At the Easton Substation, the Company proposes to remove 0.6 acres of trees to allow for the construction of the new transmission structure (Exh. DPU-V-2). In addition, the Company proposes approximately 0.1 acres of tree removal at the corner of Depot and Cross Streets (id.). Tree removal will be limited to incompatible species (mainly white pines and hardwoods) growing inside and on top of a berm along the corner (Exh. DPU-V-2). Most of the pines to be removed are between 7-9 inches diameter at breast height ("dbh") and only a few pines ranging from 12-15 inches dbh (id.). Hardwoods to be removed include young oaks of less than 8 inches dbh and a young poplar of approximately 4 inches dbh (id.). Low-growing shrubs and cedars will be left in place to provide some visual screening for the substation (id.).

At the Bird Road Substation, the Company proposes to construct a steel, single-pole, dead-end structure, approximately 95 feet in height, on a steel-reinforced concrete foundation (Exh. NG-JFH at 5).[16] The closest residence to the proposed structure is approximately 250 feet away (Exh. DPU-V-6(1), at 2). As part of the municipal Site Plan Review process for the Bird Road Substation, MMED retained a landscape architect who prepared an extensive landscape plan, which includes a variety of deciduous, flowering, and evergreen trees, shrubs, ground covers and perennials to serve as a vegetative buffer to screen the views of the substation from nearby residences (Exh. DPU-2). The landscaping plan also provides for a substantial number of trees and shrubs to be planted at several neighboring residences to screen their respective views of the Bird Road Substation (id.). The implementation of the landscaping plan by MMED for the Bird Road Substation also will provide visual mitigation for nearby residences for the transmission structure to be erected by NEP outside the substation.

b. Transmission Line

Presently, the ROW, nominally 300 feet in width, is occupied by: (1) the 331 Line on single-circuit poles that range in height from 70 feet to 97 feet located on the northerly side of the ROW; and (2) the 344 Line on double-circuit steel lattice towers that range in height from 92 feet to 134 feet (Exhs. NG-MB at 4; DPU-G-15; NG-JFH-2). As noted above, the A24 Line would be co-located on the vacant side of the existing double-circuit towers (Exhs. NG-

[16] This structure will accommodate the angle of the A24 Line as it leaves the existing ROW and enters the Bird Road Substation (Exh. NG-JFH at 6).

MB at 4). The visual impacts of the A24 Line will be limited because it entails the addition of the conductor on 23 existing lattice structures within an existing ROW (Exh. NG-JFH at 6).

The existing vegetation within the ROW is managed pursuant to a ROW Vegetation Management Plan approved by the Department of Agricultural Resources; the vegetation includes shrubs, woody vines, grasses, sedges and rushes (Exh. DPU-V-1). There also are wetland and upland areas generally consisting of open field, meadow, dense shrub thickets, marshes, wet meadow and scrub-shrub wetlands (id.).

The Project requires a maximum of 9.25 acres of clearing for the swamp mats, access roads, vegetation maintenance or vegetation clearing within the ROW (Exh. DPU-V-3). The 9.25 acres of clearing includes: an estimated 2.1 acres for upland tree pruning or removal; approximately 0.03 acres for tree removal or pruning in Bordering Vegetated Wetlands; approximately 0.56 acres of tree removal or pruning for swamp mats; and approximately 6.52 acres for vegetation clearing for access roads and access to the structures (id.). The Company stated it would likely use an excavation mower, skid steer mower, and chain saws to remove vegetation to allow for access and work pads around the structures (id.).

The Company stated that there are a total of eleven residences that currently have a direct view of the structures and wires in the ROW, with no vegetative buffer between the residence and the ROW (Exh. DPU-V-4). The Company stated that one residence currently does not have a view of the structures and wires but subsequent to the Project will have a direct view of the structures and wires in the ROW (id.). Lastly, 81 residences currently have varying degrees of views of the wires and/or structures in the ROW; and will continue to have

similar views after construction of the Project (id.). The Company pointed out that it has been working and will continue to work with abutters on a case-by-case basis to address mitigation of potential visual impacts, including the provision of plantings when appropriate (Exh. DPU-V-5).

c. Intervenor Position

The Rogers are abutters to the ROW. The Rogers have requested that the Company provide arborvitae to replace the landscaping near their property that would be removed as a result of the Project (Rogers Brief at 5).

d. Company Position

The Company argues that there will be no construction performed in the vicinity of the Rogers' property and only a "few saplings" will be removed from the ROW for clearance (Company Reply Brief at 6). In addition, the Company argues that the Rogers' existing, partial views of the transmission lines will remain unchanged after the construction of the A24 Line (id.).

4. Wetlands and Water Resources Impacts

A portion of the ROW is within the Canoe River Aquifer Area of Critical Environmental Concern ("ACEC"), which is comprised of approximately 17,200 acres in several communities, including Easton and Mansfield (Exh. NG-AMD-4, at 6). A diverse suite of wetland resources including cranberry bogs, rivers, streams, lakes and ponds overlay the Canoe River Aquifer ACEC (id.). In 1993, the United States Environmental Protection

Agency ("EPA") designated the Canoe River Aquifer as a Sole Source Aquifer, which provides drinking water for over 66,000 people (id.).

The Company asserted that the Project will result in "no permanent impacts to wetlands" (Exh. DPU-W-1). No structures are being constructed in wetlands, nor is any filling of wetlands being proposed (id.). The Company stated that maximum estimated tree removal or pruning of individual limbs along the ROW includes approximately 0.03 acres for tree pruning (five trees targeted) in Bordering Vegetated Wetlands, 0.57 acres in Bordering Land Subject to Flooding, and 0.33 acres in Riverfront Area (id.) At the request of the Easton Conservation Commission, tree limbs and trunks will be cut into smaller segments outside of Bordering Vegetated Wetlands to serve as wildlife habitat (id.). The Army Corps of Engineers, Massachusetts Department of Environmental Protection ("MADEP"), Easton Conservation Commission and Mansfield Conservation Commission have issued permits for temporary wetland impacts and concluded that there will be no permanent impacts to wetlands and no wetland mitigation is necessary (id.).

The Company will implement erosion and sediment control measures to protect wetlands and vernal pools during construction activity (Exh. DPU-W-6). NEP will temporarily place swamp mats on 0.56 acres of wetlands for construction access to existing transmission structures (Exh. NG-AMD at 7). Upon completion of construction, the Company will remove the swamp mats and restore the site to pre-existing conditions (Exh. DPU-W-4(1), at 27). Should any significant rutting result from the placement of the mats, the Company will take corrective actions such as re-grading and/or seeding (id. at 13). Wetland scientists

contracted by the Company will conduct inspection of the work areas during construction, as well as provide oversight during the installation and removal of swamp mats (Exh. DPU-W-5).

5. Endangered Species Impacts

The ROW intersects portions of Priority (PH 376) and Estimated Habitats (EH 233) as designated by the Massachusetts Natural Heritage and Endangered Species Program ("NHESP") (Exh. NG-AMD at 11). The following State-listed species have been observed within the Project area:

Table 1: State-listed Species within the Project Area

Common Name	Scientific Name	Taxonomic Group	State Status
Marbled Salamander	*Ambystoma opacum*	Vertebrate Animal	Threatened
Eastern Box Turtle	*Terrapene Carolina*	Vertebrate Animal	Special Concern
Data Sensitive Vertebrate[17]		Vertebrate Animal	Endangered

Sources: Exhs. NG-AMD at 11; NG-AMD-16

The Company retained Oxbow Associates to perform detailed studies and wildlife habitat evaluations at various locations within the ROW (Exh. NG-AMD at 11). The Company's primary strategy is to conduct construction November 2011 through March 2012, to avoid the active seasons of the rare and endangered species known to occur in the vicinity of the Project (Exhs. NG-AMD-15; DPU-E-4). In addition, through coordination with NHESP, Oxbow and the Company submitted a Mortality Avoidance Protocol on November 30, 2009, which includes the following protocols:

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[17] NHESP considers the "Data Sensitive Vertebrate" to be highly susceptible to collection. NHESP only releases information about the species if it is agreed to in writing by NHESP (See Massachusetts Public Records law: M.G.L. chapter 66, § 17D) (Exh. NG-AMD-14).

Table 2: Mortality Avoidance Protocols

Species	Mortality Avoidance Protocols
Marbled salamander	No installation or removal of swamp mats from wetlands in the vicinity of vernal pools 8 and 9 between June and November; conducting tree removal and pruning without equipment access in the vicinity of vernal pools 8, 9, and 10
Eastern box turtle	A combination of nesting surveys, construction monitoring, telemetry, nest protection and contractor education
Blanding's turtle[18]	A combination of contractor education, nesting surveys, and nest protection (during nesting season typically within the first three weeks in June) in the area of Bay Road to Depot Street
Data sensitive species	A combination of surveys, telemetry, construction monitoring, nest protection and contractor education

Source: Exh. DPU-E-6

In response to the Company's Avoidance Plan, in a December 11, 2009 letter, NHESP determined that the Project, as currently proposed, will not result in a prohibited "take" of state-listed rare species provided that the Mortality Avoidance Protocol is fully implemented under the supervision of a qualified biologist with a valid Scientific Collecting Permit (Exh. NG-AMD-6).

6. Historical and Archeological Resources

Existing transmission Structure No. 256 of the A24 Line is within the Borderland State Park Historic District, listed on the State and National Registers of Historic Places (Exh. NG-AMD-4, at 5). Historic records indicate that that the Selee Sawmill/Satan's Sawmill and its

[18] Upon request of NHESP, the Company included Blanding's turtle in its mortality avoidance protocol because there is protected habitat for Blanding's turtle near the Project (Exh. DPU-E-1). Since the Company was proposing to conduct nesting surveys for box turtles, the Company agreed to also include Blanding's turtle even though the Project is not technically within the protected habitat for that species (id.).

associated dam are located near the ROW along Poquanticut Brook (id.). The areas of archaeological sensitivity involve stone walls and an above-ground stone arrangement south of the access road and east of Structure No. 256 (Exh. NG-AMD-11 at 14).

In its plan written to avoid archaeological and historical resources ("Avoidance Plan"), The Louis Berger Group, Inc. ("Berger") concluded that the proposed placement of the swamp mats adjacent to Structure No. 256 would not directly impact historical or archeological resources (id.). The Massachusetts Historical Commission ("MHC") concurred with Berger's conclusion (Exh. NG-AMD-12).

7. Electromagnetic Fields

a. Background

The A24 Line will occupy the vacant position on a double-circuit tower that is currently carrying the 344 Line within an existing ROW approximately 300 feet in width (Exhs. RO-NG-3, at 13; NG-MB at 4). There is also a second 345 kV circuit (331 Line) on single-circuit poles within the ROW (Exh. NG-MB at 4). When lower SEMA is importing power, power on Lines 331 and 344 is flowing north to south (Exh. DPU-EMF-2). When there is excess generation in lower SEMA, power on Lines 331 and 344 is flowing south to north (id.). For the north to south power flow scenario (from the Bird Road Substation to the Easton Substation), the 331 Line carries a projected power load of 164 MVA and the 334 Line carries a projected power load of 464 MVA (Exh. RO-NG-3, at 11). For the south to north power flow scenario (from the Easton Substation to the Bird Road Substation), the 331 Line carries a projected power load of 446 MVA and the 344 Line carries a projected power load of

705 MVA (id.). The Company indicated that the A24 Line will have a minimum conductor-to-ground clearance of 32.25 feet and will carry a load of 17 MVA (north from the Easton Substation toward the Bird Road Substation) (Exh. RO-NG-3, at 11, 16).

Initially at the time the Petition was filed, the Company proposed a typical I-string configuration insulator arrangement (Exh. DPU-EMF-1). In response to abutters' concerns, the Company modified the insulator arrangement to a V-string configuration (id.). The V-string configuration insulators move the conductors away from the edge of the ROW and higher up from the ground (id.). The Company indicated that there is a slight decrease in magnetic field resulting from changing the configuration from an I-string to a V-string configuration (e.g., approximately 1 mG for the north to south power flow on the west edge of the ROW) (Exh. DPU-EMF-5).

The Company evaluated all potential phasing arrangements of the conductors of the A24 Line for both electric and magnetic field impacts within, and at the edges of, the ROW, taking into account various potential power flows on Lines 344 and 331 (Exh. RO-NG-3, at 19, 24). The Company's consultant concluded that, on balance, "BCA" is the best phasing choice for Line A24 when paired with the "ABC" phasing of Line 344 on the same double-circuit towers (id.).

b. Electric and Magnetic Field Levels of Existing and Proposed Configurations

Table 3: Electric and Magnetic Fields within and at Edges of ROW for Existing and Proposed Configurations for both North to South Power Flow and South to North Power Flow on the 345 kV Lines

Electromagnetic Fields	Location	North to South Power Flow Configuration		South to North Power Flow Configuration	
		Existing, Present Day	Proposed Configuration	Existing, Present Day	Proposed Configuration
Magnetic Field milligauss ("mG")	East edge of ROW (0 ft)	11	11	26	25
	West edge of ROW (300 ft)	10	13	16	14
	At point of maximum field within ROW	93	94	146	146
Electric Field kilovolts per meter ("kV/m")	East edge of ROW (0 ft)	0.56	0.57	0.56	0.56
	West edge of ROW (300 ft)	0.35	0.53	0.35	0.28
	At point of maximum field within ROW	4.7	4.8	4.7	4.7

Source: Exh. RO-NG-3, at 25

As noted in the above chart, for the north to south power flow on the two 345 kV lines, magnetic fields will be similar or slightly higher with the inclusion of the A24 Line and the electric fields will be slightly higher on either side of the ROW (Exh. RO-NG-3, at 25). As for south to north power flow on the 345 kV lines, the magnetic fields will be lower on either edge of the ROW and will remain the same at the point of maximum field within the ROW; the electric fields will be the same or decrease (id.). The greatest increase in magnetic fields under the modeled conditions is 3 mG at the edge of the ROW (id.).

c. Intervenor Position

The Rogers expressed concerns that family members' health would be adversely impacted by electromagnetic fields, due to the proximity of the Rogers' residence and swimming pool to the ROW (Rogers Brief at 4). The Rogers requested that the Company undertake several actions to mitigate EMF impacts, including: replacing the Rogers' above-ground pool in a location further away from the NEP's easement; moving the Rogers' existing shed further from NEP's easement; re-grading a portion of their land near the entrance to the easement area to raise the elevation and make it more useable; and providing periodic monitoring of EMF levels (id. at 5).

d. Company Position

The Company indicated that portions of the Rogers' pool and shed are located in the ROW (Company Reply Brief at 6). The horizontal distance from the closest proposed conductor of the A24 Line to the most northerly edge of the Rogers' pool wall (excluding the deck) is approximately 29 feet (Exh. RO-NG-1).[19] While the Company is not requiring the Rogers to remove the pool at this time, the Company argues that it should not be made responsible for moving either the pool or the shed, as each was constructed in the ROW either by the Rogers or a predecessor in title (Company Reply Brief at 6). The Company further argues that the Rogers' request to re-grade a portion of their property to make it more usable is

[19] At this time, without waiving any future rights, the Company is not requiring the removal or relocation of the pool as it appears adequate clearance can be maintained (Company Reply Brief at 6). The Company makes a reference to 220 CMR § 125.23; National Electric Safety Code, Rule 234E (requiring clearance of 26.59 feet) (id.).

unrelated to the construction of the A24 Line, as the Rogers' property is near the mid-point of two existing double-circuit towers (i.e., Structures Nos. 260 and 261) where no construction related grade change is required (id. at 6, 7). Lastly, the Company performed pre-Project EMF measurements at the Rogers' home on January 22, 2010, and agreed to perform follow-up EMF measurements at the Rogers' home after completing construction of the A24 Line (Exh. DPU-EMF-4(1); Company Reply Brief at 7).

8. Noise Impacts

The Company stated that potential sources of noise would be: (1) equipment for ROW mowing and vegetation trimming; (2) equipment for installing the two new transmission structures; and (3) equipment for installing insulators and related conductor work (Exhs. DPU-G-11; DPU-NO-1). The Company asserted that construction will affect a given area for a relatively short period of time as construction proceeds in sequence along the ROW (Exh. NG-MB at 7). The Company asserted that the Project would generate typical sound levels from construction equipment including excavators, bulldozers, cranes, track vehicles, track diggers, backhoes, a bucket truck, and equipment used for the conductors (Exh. DPU-NO-1). According to the Company, Mansfield does not have a noise ordinance (Exh. DPU-NO-5). Easton has an environmental performance standard relating to noise effective 10:00 p.m. to 7:00 a.m. (id.). The standard does not allow noise to exceed specified sound pressure levels ranging from 28-69 decibels based on sound frequency bands (id.).

Construction will take place during normal work hours, Monday through Friday from 7:00 a.m. to 5:00 p.m. (Exh. DPU-NO-6). Work outside these hours generally is not expected

(Exh. DPU-NO-3). However, if there are Project delays or opportunities to mitigate impacts by conducting work during off hours, the Company indicated that crews may perform work on Saturdays (id.). In addition, state or local public works departments may require the Company to complete some activities (e.g. running wire across roadways) at night or on weekends to avoid peak travel times (Exh. DPU-NO-4).

In order to mitigate noise impacts, the Company will ensure that its construction equipment complies with all relevant noise requirements and noise ordinances (id.). The Company stated it utilizes construction equipment of the latest design, which it asserts generally minimizes engine noise impacts (id.). The Company will limit vehicle idling to five minutes as required by M.G.L. c. 90, § 16A and MADEP regulations (310 CMR § 7.11(1)(b)), with exceptions for vehicles being serviced, vehicles that need to keep their engines running while making deliveries, and vehicles that need to run their engines to operate accessories (Exh. DPU-NO-6). In addition, the Company will only operate construction equipment as needed (id.).

9. Construction Equipment Air Impacts

Diesel engines produce significant amounts of particulate matter ("PM"), which are small solid and liquid particles composed primarily of carbon which can be easily inhaled and which pose a significant health risk to humans (Exh. DPU-1, at 1). MADEP indicates that reducing PM pollution from all sources, including construction equipment, is important for the health of workers and communities (id.). MADEP has established a Massachusetts Diesel Retrofit Program ("MDRP") (id. at 4). The program involves using contract specifications to

require contractors working on state-funded projects to install retrofit pollution controls on their construction equipment engines to reduce PM, volatile organic compounds ("VOCs"), and carbon monoxide ("CO") (id.).[20] In two recent Massachusetts Energy Facility Siting Board ("EFSB") cases, the EFSB imposed conditions requiring the applicant to retrofit certain diesel powered construction equipment. See GSRP Decision, EFSB 08-2/D.P.U. 08-105/106, at 80, 145 (September 28, 2010); Worcester Decision, EFSB 09-1/D.P.U. 09-52/53, at 41-43, 85 (March 14, 2011).

The Company provided a list of eight types of non-road, diesel powered construction equipment expected to be used during the construction of the A24 Line (Exh. DPU-AIR-1). The duration of construction for the Project is estimated to be five months, Fall 2011 through Winter 2012 (Exh. DPU-G-10). The Company will mitigate air impacts by using only ultra-low sulfur diesel fuel in its diesel-powered construction equipment (Exh. DPU-AIR-3).[21] Consistent with the recent EFSB decisions, the Company committed to retrofitting all diesel-powered non-road construction equipment rated 50 horsepower or above to be used for 30 or more days over the course of the Project with EPA-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies (to the extent that they

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[20] Other strategies include (1) reducing idling; (2) replacing/repowering/rebuilding older engines; and (3) using cleaner diesel fuels (Exh. EFSB-1, at 4).

[21] Ultra-low sulfur diesel has a maximum sulfur content of 15 parts per million; low sulfur diesel fuel has a maximum sulfur content of 500 parts per million (Exh. DPU-AIR-3). Therefore, use of ultra-low sulfur diesel reduces sulfur content by 97 percent (id.).

are commercially available) installed on the exhaust system side of the diesel combustion engine (Exh. DPU-AIR-3).

10. Traffic Impacts and Public Safety

The Company expects that construction of the A24 Line will have minimal impacts on traffic, and that the volume of traffic generated during construction will not be significant enough to affect traffic flow on public ways (Exh. NG-MB at 6). In addition, the five month construction period is relatively short (id.). The Company stated that the Project will not require approval of a formal traffic management plan and the Company does not anticipate that the delivery of materials will necessitate specific traffic control measures (Exh. DPU-T-2). However, installing the new conductor across roadways may require use of local police to defer traffic for a relatively short duration (id.).

During Project construction, an average of approximately 20 workers will be arriving and departing each work day in four to eight vehicles (Exh. DPU-T-1). In addition, construction supervisors and managers will be making periodic visits to the site throughout the duration of the Project (id.). Typically, construction crews will report to the staging area at the Easton Substation to review the work schedule each day (id.). A number of different access points will be used throughout the Project (id.). The Company stated that it will coordinate with local police departments and other town officials with respect to specific construction plans and will develop a formal traffic management plan, if requested by the towns (Exh. DPU-T-2).

11. Analysis and Findings

The Project will be a four-mile transmission line on existing towers within an existing ROW with a five-month construction duration (Exh. NG-MB at 4). The Department finds that, with implementation of the Company's specified mitigation and conditions imposed by the Department as discussed below, the environmental impacts of the Project will be minimal.

Because the Project will be on existing double circuit towers entirely within an existing transmission line ROW, land use impacts will be minimal (id.). The predominant land uses abutting the ROW are single family residences and open land (Exh. DPU-LU-3). The Company will notify the direct abutters regarding all construction work and will address abutters' concerns pertaining to the Project (Exh. DPU-LU-4). Accordingly, the Department finds that the land use impacts will be minimal and that the Company will take reasonable measures to avoid, minimize or mitigate these impacts.

The visual impacts of the transmission structures to be built outside the Easton and Mansfield Substations will be limited due to the minimal amount of clearing for the transmission structures (Exh. NG-JFH at 4, 5). Furthermore, the closest residences are at least 250 feet away (Exh. DPU-V-6(1), at 2). The visual impacts of the transmission structure at the Bird Road Substation will be mitigated by the landscaping to be implemented by MMED for the substation.

The visual impacts of the A24 Line within the ROW will be limited because the Project entails the addition of the conductor on 23 existing lattice structures within an existing ROW (Exh. NG-JFH at 4-6). However, due to the vegetation clearing and pruning to allow for the

construction of the A24 Line, some residences may have an incremental visual impact from the wires and/or structures compared with pre-Project conditions (Exh. DPU-V-4). The Company has agreed to work with abutters on a case-by-case basis to address mitigation of potential visual impacts, including the provision of plantings when appropriate (Exh. DPU-V-5). To minimize visual impacts, the Company shall submit to the Department a report within six months after completion of construction detailing: (a) a list of all addresses of property owners that were notified of available visual mitigation; (b) the number of property owners that received visual mitigation from the Company; (c) the type of visual mitigation (if landscaping was provided please specify the number and species of plants, shrubs and/or trees); and (d) the average cost of landscaping per property, broken down by material, labor and design costs.

The Department directs the Company to work with the Rogers to address the visual impacts due to vegetation clearing in the ROW near the Rogers' residence. The Department directs the Company to collaborate with the Rogers to devise an agreed-upon planting plan for the Company's ROW near the Rogers' residence and/or off-site mitigation on the Rogers' property, to include arborvitae species and/or shrubs. The Company shall purchase and install agreed-upon plantings. The Department finds that with the Company's specified mitigation and the implementation of the preceding conditions pertaining to mitigating visual impacts, potential visual impacts from the Project's construction and operation will be minimal, and that the Company will take all reasonable measures to avoid, minimize, or mitigate these impacts.

With respect to wetlands and water resource impacts, the impacts of the A24 Line will be limited to temporary impacts to wetlands during construction of the Project (Exh. NG-JFH

at 6). The Company's mitigation includes utilizing wetland scientists to conduct inspections during construction and provide oversight during the installation and removal of swamp mats, implementing erosion and sediment control measures, and ensuring the site is restored to its pre-Project condition (Exhs. DPU-W-5; DPU-W-6; DPU-W-4(1), at 27). The Department finds that potential impacts to wetlands and water resources from the Project's construction and operation will be minimal, and that the Company will take all reasonable measures to avoid, minimize, or mitigate these impacts.

With respect to endangered species impacts, implementation of the Company's Mortality Avoidance Protocols - including time of year restrictions, manual tree removal and pruning in the vicinity of vernal pools, conducting of nesting surveys and protection, construction monitoring by a qualified biologist, and contractor education - will minimize impacts to endangered species (Exh. DPU-E-6). Accordingly, the Department finds that potential impacts to endangered species from the Project's construction and operation will be minimal, and that the Company will take all reasonable measures to avoid, minimize, or mitigate these impacts.

With respect to impacts to historical and archeological resources, with implementation of the Avoidance Plan prepared by Berger, including strategic placement of swamp mats and limited access to Transmission Structure No. 256, impacts to the stone walls and an above-ground stone arrangement will be minimized (Exh. NG-AMD-4, at 5). Accordingly, the Department finds that potential impacts to historical and archaeological resources from the

Project's construction and operation will be minimal, and that the Company will take all reasonable measures to avoid, minimize, or mitigate these impacts.

With respect to electric and magnetic fields, the A24 Line will be co-located with the 345 kV 344 Line on double circuit towers, with a second 345 kV 331 Line on single circuit poles (Exhs. RO-NG-3; at 13; NG-MB at 4). The electric and magnetic fields of the A24 Line will be influenced by power flow direction of both 345 kV lines caused by the load level coupled with generation dispatch (Exh. DPU-EMF-2). According to the Company's analysis, the inclusion of the A24 Line in the existing ROW will result in a slight increase, or decrease, or no change, in the electric and magnetic fields levels, depending on the power flow direction of the 345 kV lines co-located in the same ROW (Exh. RO-NG-3, at 25). The Company selected the best phasing choice, on balance, for the A24 Line, taking into account both electric and magnetic field strengths, the two power flow directions of Lines 344 and 331 as well as the interaction between the proposed line and the two 345 kV lines (Exh. RO-NG-3, at 19, 24). The Company also altered the configuration of the insulator arrangement from an I-string to a V-string style to mitigate EMF by moving the conductor further from the edge of the ROW and higher up from the ground (Exh. DPU-EMF-1). In addition, the Company performed pre-Project EMF measurements at the Rogers' residence on January 22, 2010 and agreed to perform follow-up EMF measurements at the Rogers' home after completing construction of the A24 Line (Exh. DPU-EMF-4(1); Company Reply Brief at 7). The Department does not require the Company to replace the Rogers' above-ground pool in a location further away from NEP's easement; move the Rogers' existing shed further from

NEP's easement; or re-grade a portion of the Rogers' land near the entrance to the easement area to raise the elevation and make it more useable (Rogers Brief at 4). The Department agrees with the Company that the Company should not be made responsible for moving either the pool or the shed as each was constructed in the ROW either by the Rogers or a predecessor in title without the Company's consent (Company Reply Brief at 6). The Department further agrees with the Company that the Rogers' request to re-grade a portion of their property to make it more usable is unrelated to the construction of the A24 Line as the Rogers' property is near the mid-point of two existing transmission structures where no construction related grade change is required (id. at 6, 7). The Department finds with the Company's specified mitigation, potential EMF impacts from the Project's operation will be minimal, and that the Company will take all reasonable measures to avoid, minimize or mitigate these impacts.

With respect to noise impacts due to construction of the Project, potential sources of noise are equipment used for ROW mowing and vegetation trimming, equipment used for installing the two new structures, as well as equipment to install insulators and related conductor work (Exhs. DPU-G-11; DPU-NO-1). Construction will affect a given area for a relatively short period of time as construction proceeds along the ROW (Exh. NG-MB at 7). The Company's mitigation measures include using equipment of the latest design which generally minimizes noise, limiting vehicle idling, and operating equipment only as necessary (Exh. DPU-NO-6). In addition, the Company plans to limit noise impacts by completing most work during regular working hours - Monday through Friday 7:00 a.m. to 5:00 p.m. - which

is consistent with Easton's Environmental Performance Standard relating to noise (Exh. DPU-NO-3).

The Department anticipates that the Company will make every effort to avoid construction during weekday evenings and on weekends. Construction performed during weekday evenings and on weekends should be an exception. Furthermore, should construction be necessary outside of regular working hours, NEP shall seek permission from the relevant municipal authority and notify affected abutters prior to commencing any work. If such work is necessary outside of regular working hours, the Company shall use best efforts to minimize noise impacts. The Company shall perform work safely and with respect for the needs of neighbors and abutters and shall address any specific noise concerns of abutters should they arise.

The Department finds with the Company's specified mitigation and the preceding condition pertaining to mitigating noise impacts, potential noise impacts from the Project's construction and operation will be minimal, and that the Company will take all reasonable measures to avoid, minimize, or mitigate these impacts.

Construction equipment air impacts will be limited to the five months of the Project (Exh. DPU-G-10). In terms of mitigation, the Company has committed to using ultra-low sulfur diesel fuel in its diesel-powered construction equipment, limiting vehicle idling to five minutes pursuant to state regulations, and retrofitting all diesel-powered non-road construction equipment consistent with recent EFSB requirements. The Department directs the Company to submit to the Department a list of retrofitted equipment within six months after completion of

construction detailing: type of equipment, make/model, model year, engine horsepower, and the type of emission control technology installed. The Department finds that with the Company's specified mitigation and compliance with the preceding condition pertaining to mitigating construction equipment air impacts, potential air impacts from the Project's construction will be minimal, and that the Company will take all reasonable measures to avoid, minimize, or mitigate these impacts.

Potential impacts to traffic will be limited to Project construction and will be minimal as the volume of traffic generated during construction of the Project will not be so significant as to affect traffic flow on public roadways (Exhs. NG-MG at 6; DPU-T-1). Each work day, Company crews will arrive and depart the work site in four to eight vehicles (Exh. DPU-T-1). Installing the new conductor across roadways may require use of local police to direct traffic; however, it would be for a relatively short duration (Exh. DPU-T-2). The Company has conducted preliminary discussions pertaining to traffic with municipal representatives from Easton and Mansfield and will continue to coordinate with officials (Exh. DPU-T-2). The Department finds that with the Company's specified mitigation, potential traffic from the Project's construction will be minimal, and that the Company will take all reasonable measures to avoid, minimize, or mitigate these impacts.

12. Conclusions on the Impacts of the Project

The Department finds that given that the Project is proposed to be installed predominantly on existing double-circuit towers within an existing ROW, Project environmental impacts generally will be minimal. The Department further finds that the

Project will include use of feasible measures to further avoid, minimize or mitigate environmental impacts with respect to the construction of the A24 Line.

D. Conclusion on Analysis

Based on the foregoing analysis of: (i) the need or public benefit of the proposed use; (ii) alternatives explored; and (iii) impacts of the proposed use, the Department finds that the benefits of the proposed Project to the general public exceed the local impacts, and thus, that the proposed use is necessary for the purpose alleged and will serve the public convenience and is consistent with the public interest.

IV. SECTION 61 FINDINGS

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 EIR is submitted to the Secretary of Energy and Environmental Affairs, and should be based on such EIR. Where an EIR is not required, Section 61 findings are not necessary. 301 CMR 11.01 (3). Based on an Advisory Opinion from the MEPA office, the

Secretary determined that the Project does not require the preparation of an EIR (Exh. NG-AMD-5). Accordingly, Section 61 findings are not necessary in this case.[22]

V. ORDER

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

ORDERED: That the petition of New England Power Company, d/b/a National Grid, seeking approval to construct and operate a transmission line pursuant to G.L. c. 164, § 72, is granted; and it is

FURTHER ORDERED: That New England Power Company, d/b/a National Grid, work cooperatively with municipal and state officials and affected property owners in Easton and Mansfield to minimize traffic, noise, construction, wetlands, visual impacts and other local impacts associated with the Project; and it is

FURTHER ORDERED: That New England Power Company, d/b/a National Grid, work with the Rogers to address visual impacts due to vegetation clearing in the ROW near the Rogers' residence. The Department directs the Company to collaborate with the Rogers to devise an agreed-upon planting plan for the Company's ROW near the Rogers' residence

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[22] The Department notes the requirements set forth in G.L. c. 30A, § 61 effective November 5, 2008, regarding findings related to climate change impacts. The Department further notes that this Project will have minimal or no permanent greenhouse gas emissions, as it is an overhead transmission line that will be built in an existing ROW. As such, the Project will not have direct emissions from a stationary source or indirect emissions from energy consumption and will have minimal indirect emissions from transportation sources limited to construction, occasional repair or maintenance activities. The Department addresses temporary emissions from off-road construction vehicles in Section III.C.9, above.

and/or off-site visual mitigation on the Rogers' property, to include arborvitae species and/or shrubs. The Company shall purchase and install agreed-upon plantings; and it is

FURTHER ORDERED: That New England Power Company, d/b/a National Grid submit a report to the Department within six months after completion of construction detailing: (a) a list of all addresses of property owners that were notified of available visual mitigation; (b) the number of property owners that received visual mitigation from the Company; (c) the type of visual mitigation (if landscaping was provided specify the number and species of plants, shrubs and/or trees); and (d) the average cost of landscaping per property, broken down by material, labor and design costs; and it is

FURTHER ORDERED: That New England Power Company, d/b/a National Grid, submit a list to the Department of the retrofitted equipment within six months after completion of construction detailing: type of equipment, make/model, model year, engine horsepower, and the type of emission control technology installed; and it is

FURTHER ORDERED: That New England Power Company, d/b/a National Grid, make every effort to avoid construction during weekday evenings and on weekends. Construction performed during weekday evenings and on weekends should be an exception. Furthermore, NEP shall seek permission from the relevant municipal authority and shall notify affected abutters prior to commencing work outside of regular working hours. If such work is necessary, the Company shall use best efforts to minimize noise impacts; and it is

FURTHER ORDERED: That New England Power Company, d/b/a National Grid, shall obtain all other governmental approvals necessary for this proposed transmission project; and it is

FURTHER ORDERED: That New England Power Company, d/b/a National Grid, shall construct and operate the Project in accordance with this Order and shall notify the Department of any significant changes in the planned timing, design, or environmental impacts of the Project; and it is

FURTHER ORDERED: That the Secretary of the Department shall transmit a certified copy of this Order to the Towns of Easton and Mansfield and that New England Power Company, d/b/a National Grid, shall serve a copy of this Order on the Boards of Selectmen, Conservation Commissions and Planning Boards for both the Towns of Easton and Mansfield. within five business days of its issuance and shall 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:

_____
Ann G. Berwick, Chair

_____
Jolette A.Westbrook, 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.