4 ROUTE SELECTION PROCESS

As discussed in previous sections, NEP proposes to replace the Existing Lines and Taps with Rebuilt Lines and Taps within their existing ROWs in Massachusetts. The Rebuilt Lines will address asset-condition and reliability concerns and allow for operation at 115 kV, should this become necessary to address future system requirements.

Consistent with the Siting Board's standards and the requirements of G.L.c.164, § 69J, this section describes the process by which NEP evaluated potential route alternatives[8] to ensure no clearly superior route was overlooked. NEP's review of potential route alternatives was informed by the need to maintain reliable service to electric customers in 26 Massachusetts cities and towns both during and after construction. As discussed in *Sections 2* and *3*, these towns are dependent on the E5/F6 Lines for electric service. Thus, any feasible alternative route must continue to serve the existing substations along the E5/F6 corridor.

Due to these constraints, routes with significant geographic diversity would not meet the Project need. In addition, the routing evaluation was informed by the common-sense premise that rebuilding a transmission line within its existing ROW generally will be more efficient, more cost-effective, and less disruptive than relocating it to a new ROW. Furthermore, even if an alternative route was selected, the existing E5/F6 Line infrastructure would still need to be deconstructed and salvaged for safety reasons, which would generate environmental impacts from access and work pad construction comparable to the anticipated impacts from the proposed rebuilding of the line. However, NEP did evaluate potential route alternatives to ensure the Project best balanced considerations of reliability, and minimization of environmental impacts and costs. When compared to other potential routing opportunities, the Existing Lines and Taps[9] ROWs offered clear advantages and, as such, is presented as the single route option for the Project ("Project Route").

4.1 Overview of Route Selection Methodology

The objective of NEP's routing evaluation was to identify technically feasible route alternatives that would maintain system function, minimize impacts to the natural and social environments, and minimize construction and operation costs.

The route evaluation began with NEP defining a study area centered on the existing E5/F6 ROW and developing a general set of route evaluation criteria. NEP then identified a wide variety of potential overhead routes using the most recent available mapping, databases, and aerial photography, focusing on identifying existing linear corridors located within or adjacent to the E5/F6 transmission corridor. These potential route options included existing electric transmission, railroad, natural gas pipeline, and highway and roadway corridors.

NEP then screened these linear corridors against the route selection criteria (described below in *Section 4.3*) to assess whether any would be a potentially superior route to the existing E5/F6

[8] "Alternatives" include full route alternatives and partial route variations, which may only be applicable to specific segments of the E5/F6 and Tap Line corridors.

[9] For the purposes of this section, references to the E5/F6 corridor or ROW includes the Taps.

ROW. Routes were initially screened out if they were clearly inferior to the Project Route because they could not maintain system function and operability. Following the initial screening, NEP continued to focus on maximizing the use of existing linear corridors while minimizing construction constraints, costs, and environmental impacts. As a result of this iterative process, NEP determined that no candidate routes were equal or superior to the Project Route, which maintains the E5/F6 Lines and Taps in their existing ROWs. As such, NEP is not proposing to construct the Project on any route other than along the existing E5/F6 corridor.

4.2 Definition of Study Area

NEP began the route evaluation by establishing a study area surrounding NEP's existing E5/F6 ROW between the Millbury #305 Substation and the Deerfield #4 Substation (the "Study Area"). To ensure that the full range of options was considered, and that a clearly superior route alternative was not overlooked, NEP broadly defined the Study Area to include land within the following boundaries as shown in Figure 4-1, below:

- NEP's A127 and B128 transmission ROWs (to the north of the existing E5/F6 ROW)
- NEP's V174 line, NSTAR Electric Company dba Eversource Energy's ("Eversource") 301 Line, Interstate Highway 90 ("I-90"), Interstate Highway 91 ("I-91"), State Route 9, and State Route 112 (to the south of the existing E5/F6 ROW).

Expanding outward from the E5/F6 ROW, the 1,047-square-mile Study Area is bounded by the first overhead transmission corridors that do not present reasonable options to supply power to the existing substations served by the E5/F6 Lines and Taps: (1) Millbury #305 Substation in Millbury, (2) Pondville #26 Tap and Substation in Auburn, (3) Leicester #21 Tap and Substation in Leicester, (4) Meadow Street #552 Substation in Spencer, (5) Harrington #2234 Tap and Substation in East Brookfield, (6) Lashaway #525 Tap and Substation in North Brookfield, (7) Ware #1 Substation in Ware, (8) Quabbin Switching Tap and Tower in Belchertown, (9) Shutesbury #704 Tap and Substation in Shutesbury, (10) Deerfield #2 Substation in Shelburne, (11) Deerfield #3 Tap and Substation in Shelburne, and (12) Deerfield #4 Substation in Shelburne.

In general, the Study Area contains municipalities in Worcester, Hampden, Hampshire, and Franklin Counties, of which Hampshire and Worcester Counties contain the most densely developed population areas, including Belchertown and Auburn. The majority of the Study Area consists of exempt properties[10], residential areas, and open lands interspersed with pockets of forest, mixed use, commercial, industrial, transportation corridors, and agricultural lands. Additionally, within the Study Area, a few municipalities own, maintain, and operate municipal light plants that provide electric services to their customers, including Leverett Municipal Light Plant.

[10] Exempt properties are properties that qualify from exemption from taxation under various provisions of the law and include public land and facilities, hospitals, schools, churches, and cultural institutions, G.L. c. 59 §5.

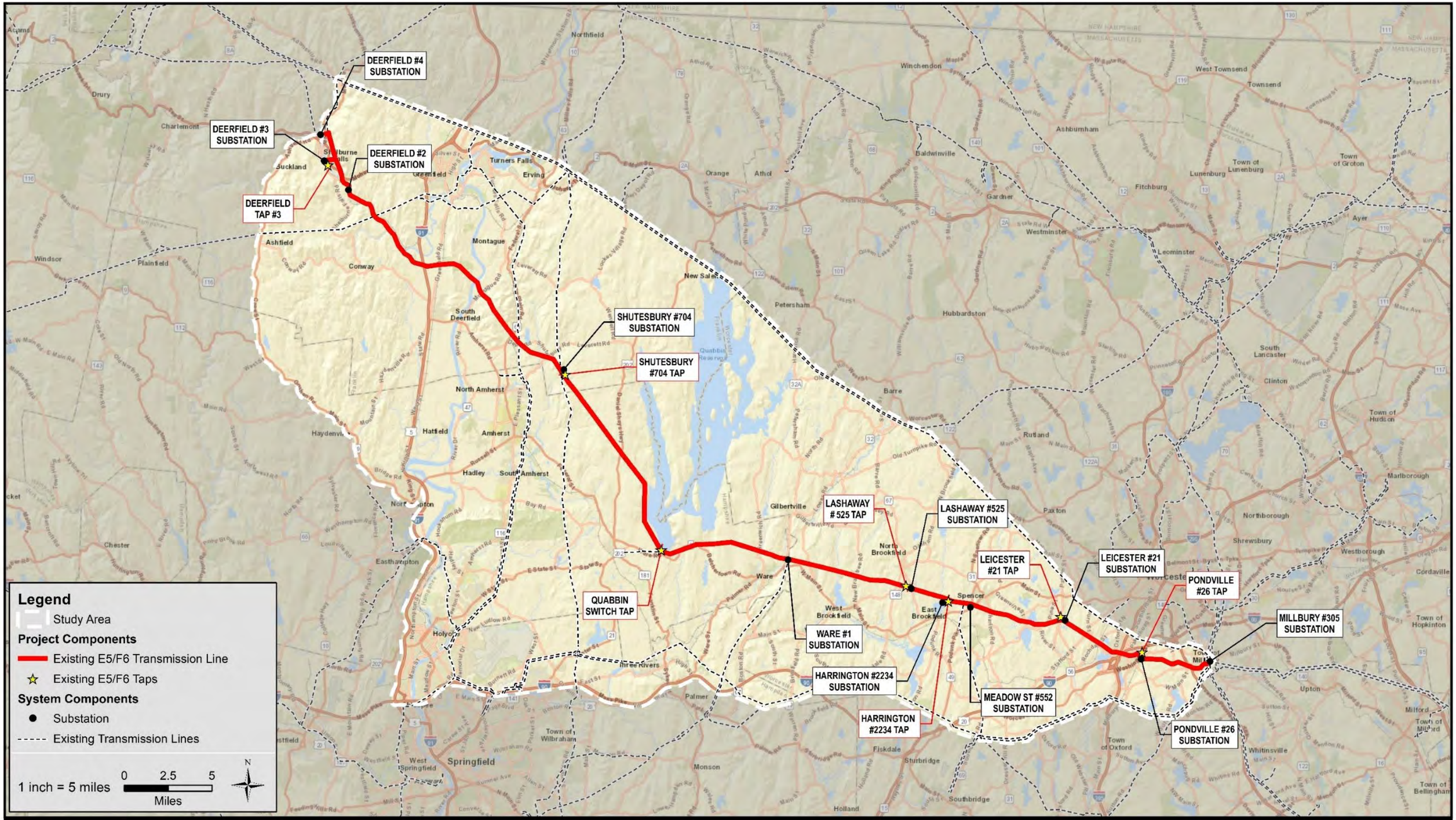

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Figure 4-1
Routing Study Area

4.3 Establishment of Route Evaluation Criteria

An initial step in NEP's analysis was to establish general criteria to identify potential overhead and underground routes. Important operational considerations in constructing the overhead line include compliance with vertical and horizontal clearance codes, maintenance of depths and setbacks from other active utilities, the need to continue service to intermediate substations along the ROW, and final connections to substations. Based on these operational considerations and additional construction and environmental considerations, NEP established the following general criteria:

1. **Maintain system function, operability, and reliability.** Because the Project is proposed to address existing asset-condition concerns and future system requirements, NEP's primary routing consideration was the need to maintain reliable delivery of electricity to customers in 26 Massachusetts cities and towns and the ability to connect the substations serviced by the E5/F6 Lines and Taps. The Existing Lines are the sole transmission supply to the majority of the substations listed in *Section 4.2*. In addition, comparable or superior routes must allow general accessibility[11] to the Rebuilt Lines for future maintenance or repair. Access to all locations along an overhead route is typically not required; however, all structure locations must be reachable from some appropriate access point. NEP accordingly sought routes that would minimize access restrictions.
2. **Maximize the use of existing linear corridors.** Where sufficient space is available, collocation along existing linear corridors already encumbered by infrastructure minimizes conflicts with federal, state, and local land use plans and policies; minimizes the need to acquire land or land rights; and decreases environmental impacts significantly as compared to the establishment of a new corridor. In particular, utilizing existing transmission line ROWs, offers the benefit of an established network of access routes and lands already encumbered with utility easements without the need to expand or create a new ROW. These attributes of existing linear corridors also have a positive impact on project cost and schedule. Accordingly, and because the Project can be accommodated within existing ROWs, established linear corridors (e.g., transmission line, highway, railroad, and pipeline corridors) were prioritized in the route evaluation.
3. **Minimize impacts to environmental resources.** NEP sought to identify route alternatives that would minimize impacts to environmental resources such as land use, wetlands and wildlife, rare species habitats, historical/archaeological resources, and other designated resources.
4. **Minimize cost.** NEP sought to identify route alternatives that would avoid costly remediation or construction requirements or, alternatively, would provide some opportunity for securing cost reductions when compared to utilizing the existing corridor.
5. **Limit construction constraints.** In evaluating potential route options within the Study Area, NEP gave preference to route alternatives that would minimize constructability constraints and limitations. For example, road/highway crossings or working within other utility corridors (e.g., railroad corridors) can result in access restrictions, workspace

[11] Accessibility includes access and work envelopes required to construct, operate, and maintain the Rebuilt Lines and Taps.

constraints, safety concerns, traffic disruptions, and restrictive work hours, all of which impact Project cost and schedule.

6. **Minimize impacts to densely developed areas.** The placement of transmission facilities in densely developed areas typically creates additional complexity both during initial construction and when maintenance or replacement is required. The potential for construction and maintenance work-hour restrictions, limited access availability, and the need for additional ROW and/or temporary workspace are more prevalent in densely populated areas. Therefore, NEP sought to identify route alternatives that would, to the extent practicable, minimize impacts to densely developed areas and the social environment.

4.4 Potential Route Options

Using the route evaluation criteria, NEP mapped existing linear corridors within the Study Area that could be used to develop routes that would maintain system function and operation without the need to create a new ROW. NEP focused on the use of existing utility and transportation corridors in proximity to the E5/F6 corridor. Numerous linear corridors were identified through a macro-review of USGS topographic maps, Massachusetts Geographic Information System ("MassGIS") data, and aerial imagery within the Study Area. These corridors were utilized to develop potential routes, including those associated with electric transmission lines, natural gas pipelines, railroads, highways and major roadways. The existing corridors identified in the Study Area are summarized below and depicted in Figure 4-2.

4.4.1 Electric Transmission Line Corridors

Fourteen existing overhead electric transmission line corridors were identified in the Study Area as shown in Figure 4-3. In addition to the E5/F6 ROW, NEP owns and operates the majority of ROWs 1, 2, 3, 4, 5, 6, 7, 11, and 14 and Eversource owns and operates the majority of ROWs 3, 8, 9, 10, 12, and 13.

The existing transmission line corridors identified in the Study Area are described below and shown on Figure 4-3. A detailed overview of existing transmission ROWs within the Study Area is provided in Table A, of the "Routing Selection Process – Supporting Information" in Appendix 4-1.

- **ROW 1**: This is an estimated 125-to-250-foot-wide transmission ROW that runs approximately 61.2 miles NW/SE through the northern corner of the Study Area.
- **ROW 2**: This is an estimated 200-to-250-foot-wide transmission ROW that runs approximately 15.6 miles E/W through the eastern corner of the Study Area.
- **ROW 3:** This is an estimated 200-foot-wide transmission ROW that runs approximately 25.8 miles E/W through the south-eastern corner of the Study Area.
- **ROW 4:** This is an estimated 80-to-130-foot-wide transmission ROW that runs approximately 8.9 miles N/S through the southern corner of the Study Area.
- **ROW 5:** This is an estimated 70-to-100-foot-wide transmission ROW that runs approximately 8.4 miles N/S through the south-eastern corner of the Study Area.

- **ROW 6:** This is an estimated 100-foot-wide transmission ROW that runs approximately 3.7 miles N/S through the western corner of the Study Area.
- **ROW 7:** This is an estimated 200-foot-wide transmission ROW that runs approximately 2.7 miles N/S through the north-western corner of the Study Area.
- **ROW 8:** This is an estimated 140-to-200-foot-wide transmission ROW that runs approximately 30.3 miles N/S through the center of the Study Area.
- **ROW 9:** This is an estimated 130-to-200-foot-wide transmission ROW that runs approximately 20 miles E/W through the western corner of the Study Area.
- **ROW 10:** This is an estimated 100-to-140-foot-wide transmission ROW that runs approximately 3.6 miles NE/SW through the western corner of the Study Area.
- **ROW 11:** This is an estimated 130-to-200-foot-wide transmission ROW that runs approximately 31.1 miles N/S through the central-west corner of the Study Area.
- **ROW 12**: This is an estimated 150-to-250-foot-wide transmission ROW that runs approximately 12 miles N/S through the south-western corner of the Study Area.
- **ROW 13:** This is an estimated 150-to-200-foot-wide transmission ROW that runs approximately 9.6 miles E/W through the south-western corner of the Study Area.
- **ROW 14:** This is an estimated 100-foot-wide transmission ROW that runs approximately two miles NW/SE through the center of the Study Area.

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DEERFIELD #4 SUBSTATION
DEERFIELD #3 SUBSTATION
DEERFIELD #2 SUBSTATION
DEERFIELD TAP #3
SHUTESBURY #704 SUBSTATION
SHUTESBURY #704 TAP
LASHAWAY # 525 TAP
LASHAWAY #525 SUBSTATION
LEICESTER #21 TAP
LEICESTER #21 SUBSTATION
PONDVILLE #26 TAP
PONDVILLE #26 SUBSTATION
MILLBURY #305 SUBSTATION
MEADOW ST #552 SUBSTATION
HARRINGTON #2234 SUBSTATION
HARRINGTON #2234 TAP
WARE #1 SUBSTATION
QUABBIN SWITCH TAP

Legend

- Study Area

Project Components

- Existing E5/F6 Transmission Line
- Existing E5/F6 Taps

System Components

- Substation
- Existing Transmission Lines
- Existing Railroads
- Natural Gas Pipeline
- Interstates
- Highways
- Major Roads

1 inch = 5 miles

0 2.5 5 Miles

N

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Figure 4-2
Potential Route Options within the Study Area

DEERFIELD #4 SUBSTATION
DEERFIELD #3 SUBSTATION
DEERFIELD #2 SUBSTATION
DEERFIELD TAP #3
ROW 6
ROW 7
ROW 10
ROW 9
SHUTESBURY #704 SUBSTATION
SHUTESBURY #704 TAP
ROW 1
ROW 11
ROW 8
ROW 14
LASHAWAY # 525 TAP
LASHAWAY #525 SUBSTATION
LEICESTER #21 TAP
LEICESTER #21 SUBSTATION
PONDVILLE #26 TAP
MILLBURY #305 SUBSTATION
QUABBIN SWITCH TAP
ROW 4
WARE #1 SUBSTATION
ROW 13
ROW 12
ROW 3
HARRINGTON #2234 SUBSTATION
ROW 5
ROW 2
MEADOW ST #552 SUBSTATION
HARRINGTON #2234 TAP
PONDVILLE #26 SUBSTATION

Legend

- Study Area
- **Project Components**
  - Existing E5/F6 Transmission Line
  - Existing E5/F6 Taps
- **System Components**
  - Substation
  - Existing Transmission Lines
  - Existing Railroads
  - Interstates
  - Highways
  - Major Roads
  - ROW 1
  - ROW 2
  - ROW 3
  - ROW 4
  - ROW 5
  - ROW 6
  - ROW 7
  - ROW 8
  - ROW 9
  - ROW 10
  - ROW 11
  - ROW 12
  - ROW 13
  - ROW 14

1 inch = 5 miles

0 2.5 5

Miles

N

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Figure 4-3

Electric Transmission Line Corridors

4.4.2 Municipal Utility Corridors

No viable municipal utility corridors were identified within the Study Area.

4.4.3 Railroad Corridors

Several railroad corridors run north-south and east-west through the Study Area as shown in Figure 4-4. All railroad corridors identified within the Study Area have been described in Table B in Appendix 4-1. Of the railroad corridors identified, eight run east-west in proximity to the E5/F6 corridor as described below:

- The CSX Boston Subdivision Railroad runs approximately 53 miles east-west through the eastern corner of the Study Area. Portions of the railroad corridor are located within the Leicester #21 Substation and the Pondville #26 Tap and Substation.
- The Patriot Corridor Railroad runs approximately 49 miles east-west through the western corner of the Study Area. Portions of the corridor are located in the vicinity of Deerfield #3 Tap and Substation.
- Several smaller sections of railroad corridors traverse the Study Area in east-west direction, including the following:
- The East Brookfield & Spencer Railroad runs approximately two miles east-west through the eastern portion of the Study Area.
- The Williamsburg Branch Railroad runs approximately seven miles east-west through the western portion of the Study Area.
- The East Deerfield Loop Railroad runs approximately one mile east-west through the north-central corner of the Study Area.
- The North Brookfield Railroad (Local) – North Brookfield Railroad runs approximately five miles east-west through the eastern portion of the Study Area.
- The Palmer Industrial Park Railroad runs approximately one mile east-west through the southern portion of the Study Area.
- The Greenfield Running Railroad runs approximately four miles east-west through the north-western corner of the Study Area.

A detailed overview of the rail corridors within the Study Area is provided in Table B in Appendix 4-1.

4.4.4 Highway and Major Roadway Corridors

Several major highways and roadway corridors run north-south and east-west through the Study Area as shown in Figure 4-5. Of the existing roadway and highway corridors identified, the following run proximate to the E5/F6 corridor in an east-west direction:

- US State Highway 20 - US State Highway 20 generally runs east-west through the Study Area, but well to the south of the Millbury #305 Substation.

- State Route 2/2A – State Route 2/2A generally runs east-west through the Study Area, but well to the north of the Deerfield #4 Substation.
- State Route 9 - State Route 9 generally runs east-west through the Study Area, but well to the south of the Quabbin Switch Tap and Meadow Street #552 Substation.
- State Route 116 - State Route 116 generally runs proximate to Shutesbury #704 Tap and Substation in a east-west direction through the towns of Holyoke, South Amherst, Amherst, North Amherst, South Deerfield, Conway, and Ashfield.

A detailed overview of the highway and roadway corridors within the Study Area is provided in Table C in Appendix 4-1.

4.4.5 Local Roadway Network

There are numerous local roadway networks throughout the municipalities located within the Study Area. Some roadway networks are concentrated in urban areas such as Auburn and Millbury, while a majority are more rural, including those crossing through the towns of Pelham and Leverett. The local roadway networks across the Study Area are typically paved, but also consist of gravel and dirt roadways.

4.4.6 Natural Gas Pipeline Corridors

One natural gas pipeline, the Tennessee Gas Pipeline ("TGP"), was identified within the eastern corner of the Study Area, as shown in Figure 4-6. The TGP corridor runs through the towns of Charlton, Millbury, and Spencer, along with a small portion in Auburn within the Study Area.

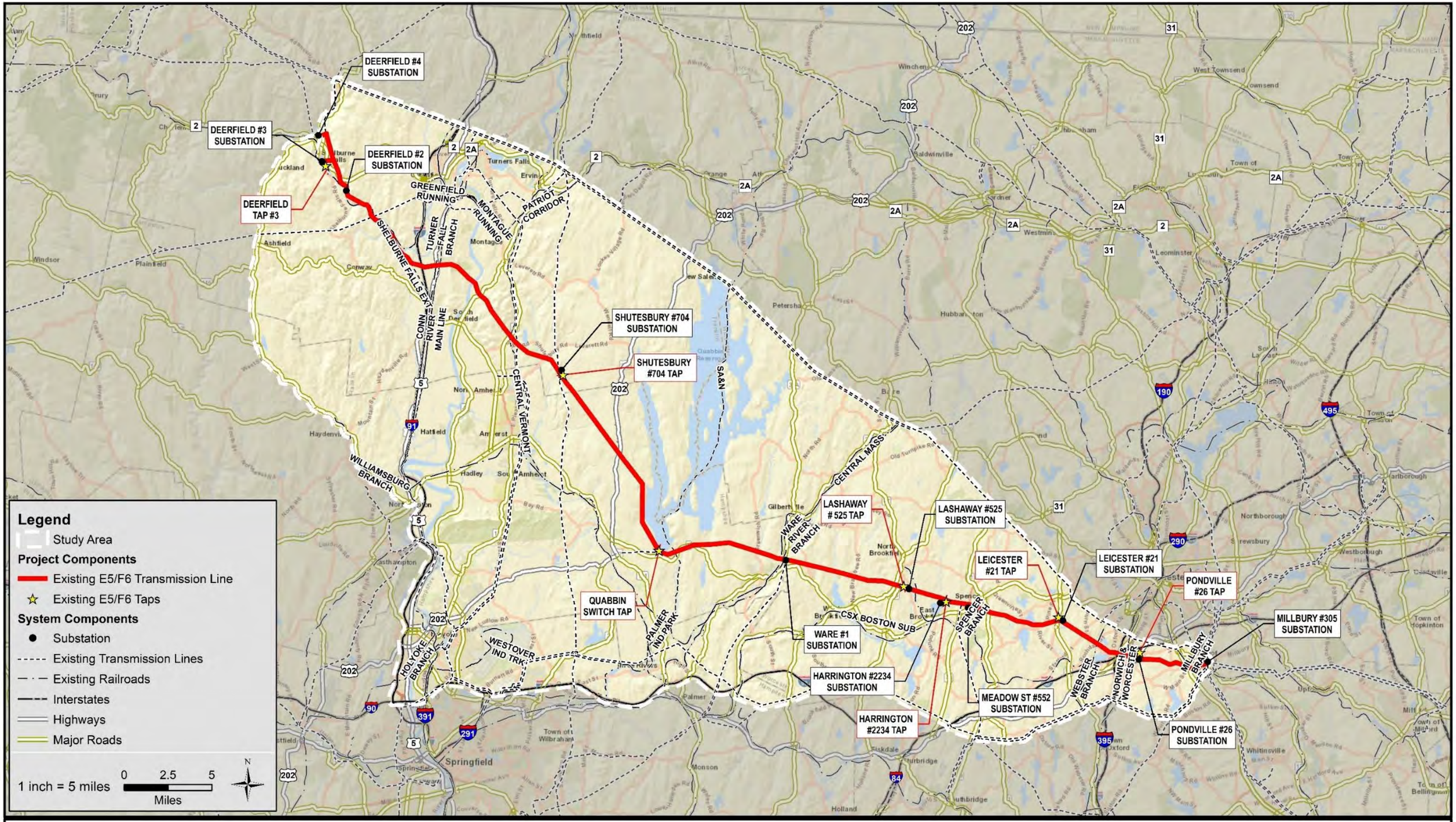

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Figure 4-4
Railroad Corridors

DEERFIELD #4 SUBSTATION
DEERFIELD #3 SUBSTATION
DEERFIELD #2 SUBSTATION
DEERFIELD TAP #3
SHUTESBURY #704 SUBSTATION
SHUTESBURY #704 TAP
QUABBIN SWITCH TAP
LASHAWAY # 525 TAP
LASHAWAY #525 SUBSTATION
WARE #1 SUBSTATION
HARRINGTON #2234 SUBSTATION
HARRINGTON #2234 TAP
LEICESTER #21 TAP
LEICESTER #21 SUBSTATION
MEADOW ST #552 SUBSTATION
PONDVILLE #26 TAP
PONDVILLE #26 SUBSTATION
MILLBURY #305 SUBSTATION

Legend
- Study Area

Project Components
- Existing E5/F6 Transmission Line
- Existing E5/F6 Taps

System Components
- Substation
- Existing Transmission Lines
- Interstates
- Highways
- Major Roads

1 inch = 5 miles
0 2.5 5
Miles
N

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Figure 4-5
Highway and Major Roadway Corridors

DEERFIELD #4 SUBSTATION
DEERFIELD #3 SUBSTATION
DEERFIELD #2 SUBSTATION
DEERFIELD TAP #3
SHUTESBURY #704 SUBSTATION
SHUTESBURY #704 TAP
QUABBIN SWITCH TAP
LASHAWAY # 525 TAP
LASHAWAY #525 SUBSTATION
LEICESTER #21 TAP
LEICESTER #21 SUBSTATION
PONDVILLE #26 TAP
MILLBURY #305 SUBSTATION
WARE #1 SUBSTATION
HARRINGTON #2234 SUBSTATION
HARRINGTON #2234 TAP
MEADOW ST #552 SUBSTATION
PONDVILLE #26 SUBSTATION

Legend

- Study Area

Project Components

- Existing E5/F6 Transmission Line
- Existing E5/F6 Taps

System Components

- Substation
- Existing Transmission Lines
- Natural Gas Pipeline
- Interstates
- Highways
- Major Roads

1 inch = 5 miles

0 2.5 5
Miles

N

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Figure 4-6
Natural Gas Pipeline Corridors

4.5 Identification and Screening of Potential Route Options

NEP applied the route evaluation criteria to identify and evaluate existing linear corridors that could serve as a potentially superior route alternative for some or all of the Project. All corridors evaluated in the initial screening process are shown in Figure 4-2.

4.5.1 Initial Screening: Maintaining System Function, Operability, and Reliability

NEP's initial screening of existing linear corridors focused on identifying corridors that could provide system function and service to the 26 communities served by the Existing Lines, as well as allow for general accessibility for future maintenance or repair. Corridors that did not share the generally southeast-to-northwest orientation of the Existing Lines or provide access to each of the intermediate substations, were eliminated during this screening. Figure 4-7 highlights the linear corridors that provide no practical connection to the substations currently served by the Existing Lines and have therefore been eliminated. Please refer to Tables D, E, F, and G in Appendix 4-1 for a detailed summary of the corridors eliminated from further consideration.

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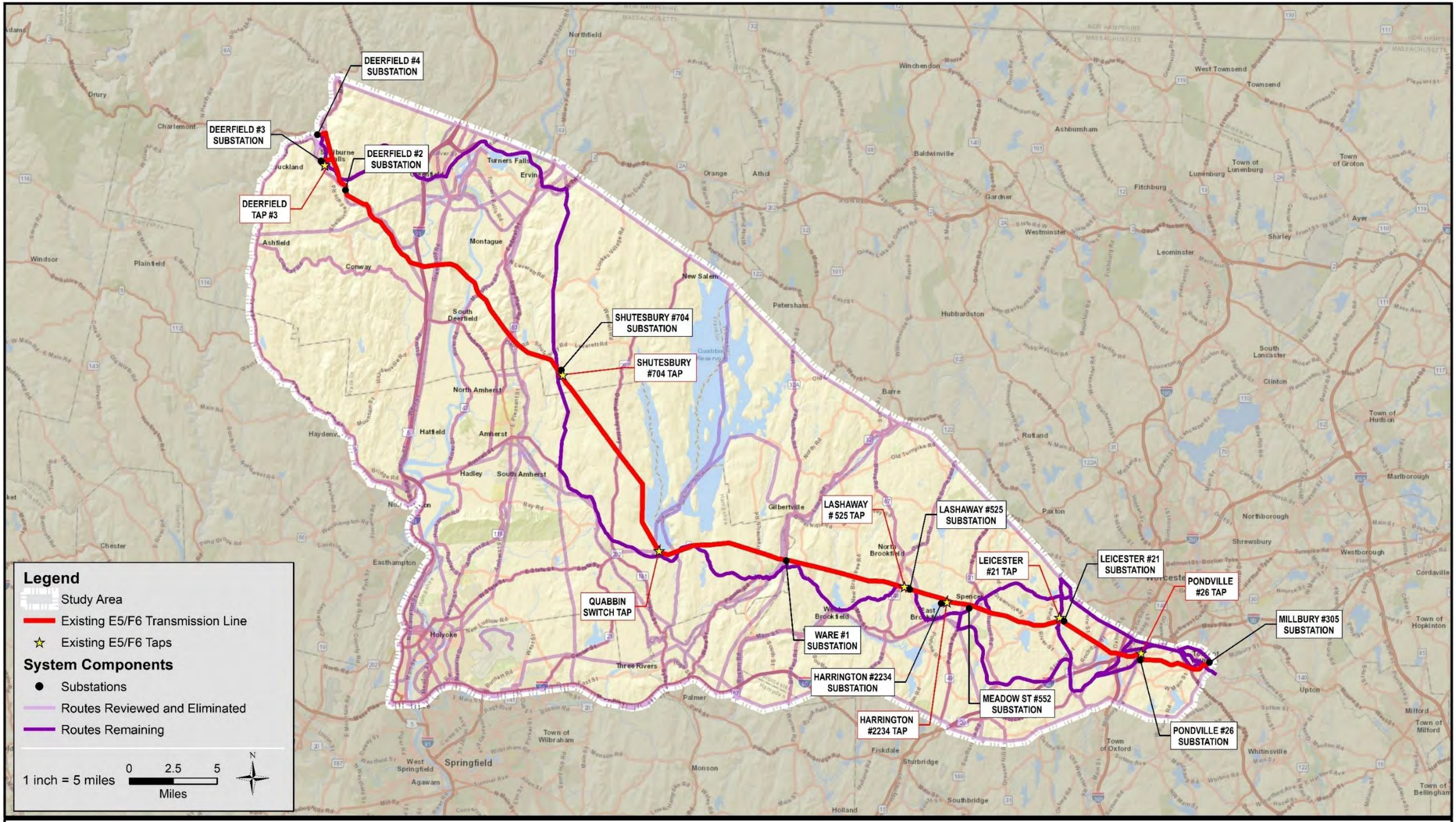

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Figure 4-7
Routes Eliminated from Further Consideration

4.5.2 Secondary Screening

Following the initial route screening, NEP reviewed the remaining linear corridors (depicted in Figure 4-8 and determined that no feasible route alternatives were available for the entirety of the E5/F6 transmission corridor.

However, as part of the secondary screening, NEP further evaluated these linear corridors for their ability to serve as potential alternate routes for the existing EF/F6 corridor, with a focus on minimizing engineering, construction, and future operating constraints, as well as potential natural and social/developed environmental constraints. Of the linear corridors remaining for consideration, potential route segment variations consisted of electric transmission line, railroad, highway, major roadways, and the local roadway network.

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DEERFIELD #4 SUBSTATION
DEERFIELD #3 SUBSTATION
DEERFIELD #2 SUBSTATION
DEERFIELD TAP #3
ROW 8
SHUTESBURY #704 SUBSTATION
SHUTESBURY #704 TAP
ROW 4
QUABBIN SWITCH TAP
LASHAWAY # 525 TAP
LASHAWAY #525 SUBSTATION
WARE #1 SUBSTATION
HARRINGTON #2234 SUBSTATION
HARRINGTON #2234 TAP
LEICESTER #21 TAP
LEICESTER #21 SUBSTATION
PONDVILLE #26 TAP
ROW 1
MILLBURY #305 SUBSTATION
CSX BOSTON SUB
MEADOW ST #552 SUBSTATION
PONDVILLE #26 SUBSTATION
PROVIDENCE & WORCESTER

Legend

- Study Area

Project Components

- Existing E5/F6 Transmission Line
- Existing E5/F6 Taps

System Components

- Substation
- Existing Transmission Lines
- Existing Railroads
- Interstates
- Highways
- Major Roads

Remaining Routes

- Transmission Line
- Highways and Major Roads
- Railroad

1 inch = 5 miles

0 2.5 5

Miles

N

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Figure 4-8

Linear Corridors Remaining after Initial Screening

The majority of the potential route segment variations identified presented alternatives to the portion of the E5/F6 corridor located between Lashaway #525 Substation and Millbury #305 Substation, with more limited options available for the northern portion of the route. These potential route segment variations for the E5/F6 corridors are summarized in Table 4-1.

Table 4-1: Potential Route Variations Reviewed During Secondary Screening

Corridor Type	Potential Route Segment Variation	Location
Transmission Line and Roadway Combination	ROW 8 (Eversource 354) and State Route 2/2A	Between Deerfield #3 Substation in Shelburne and Shutesbury Substation in Shutesbury
Transmission Line and Roadway Combination	Combination of State Route 32, portion of ROW 4 (National Grid O15N Line), State Route 9, State Route 67, State Route 148, and Project Route (National Grid E5/F6 Line)	Between Ware #1 Substation in Ware and Lashaway Substation in North Brookfield
Railroad and Roadways Combination	Portion of North Brookfield and State Route 9	Between Lashaway #525 Substation in North Brookfield and Meadow Street #552 Substation in Spencer
Roadways only	State Route 56 and State Route 9	Between Meadow Street #552 Substation in Spencer and Leicester #21 Substation in Leicester
Transmission Line and Roadway Combination	Combination of State Route 9, State Route 31, and Project Route (National Grid E5/F6 Line)	
Railroad and Roadways Combination	Combination of State Route 9, State Route 49, portion of CSX Boston Sub, and State Route 56	
Transmission Line and Roadway Combination	Combination of State Route 56, portion of ROW 1 (National Grid A127 and B128 Line) and U.S. Highway 20	Between Leicester #21 Substation in Leicester and Pondville #26 Substation in Auburn
Major Highways and Roadways Combination	Combination of U.S. Highway 20 and State Route 56	
Major Highways and Roadways Combination	Combination of U.S. Highway 20, State Route 146, Interstate 290 (I-290), State Route 12, State Route 9, and State Route 56	
Transmission Line and Roadway Combination	Combination of U.S. Highway 20, and portion of ROW 1 (National Grid A127 and B128 Line)	Between Pondville #26 Substation in Auburn and Millbury #305 Substation in Millbury
Major Highways and Roadways Combination	Combination of State Route 122A and U.S. Highway 20	
Railroad and Roadways Combination	Combination of a portion of Providence and Worcester and U.S. Highway 20	
Railroad and Roadways Combination	Combination of U.S. Highway 20 and Interstate 90 (I-90), State Route 122/122A and/or Providence and Worcester (“P&W”)	

These potential segment variations were compared to the EF/F6 corridor using the route evaluation criteria to ensure no superior route alternatives were overlooked. While all potential route segment variations would involve utilizing existing linear corridors to the maximum extent feasible, installation of a new overhead line along other electric transmission lines, railroads, highways, and major roadways would require obtaining new property rights, and encroaching upon open space and residential properties in some locations.

In addition, all potential route variations, including other electric transmission lines, would require the use of railroad, highway, and/or major roadway corridors in order to provide an alternative that would maintain system function. The installation of a new overhead line along railroad, highways, and major roadways would result in a longer and less direct route compared to the Project Route (E5/F6 Line), resulting in a significant construction and maintenance constraints, and associated cost. Collocating a transmission line along a railroad corridor or highway corridor may be possible; however, a project proponent must demonstrate to the applicable transportation agency that there is no feasible alternative to collocating these facilities, which is not the case here. In addition, working within other utility corridors (e.g., railroad corridors) and road/highway crossings would result in access restrictions, workspace constraints, safety concerns, traffic disruptions, and restrictive work hours during both initial construction and long-term maintenance and operations activities. Finally, locating new overhead transmission lines along major highways, roadways, and railroads would result in new visual, traffic, and environmental impacts to communities and natural systems.

For the reasons summarized above, given the availability of the existing E5/F corridor, the remaining electric transmission line, railroad, highway, and major roadway corridors were eliminated from further consideration. A detailed overview of the explanation of elimination of potential route variation is provided in Table H in Appendix 4-1.

While local roadways may provide route options that present reasonable connections to the substations served by the Existing Lines and Taps, these corridors were dismissed from further consideration because the installation of new overhead lines would require obtaining new property rights, grants of location, encroach on open space and residential properties, and potentially require the release of conservation lands via the Article 97 land disposition process through the Legislature of the Commonwealth. Since the Project presents an option that would maintain the Rebuilt Lines within existing and established ROWs, the local roadway network does not offer superior route alternatives and has been removed from further consideration.

4.5.3 Summary and Proposed Project Route

NEP evaluated existing linear corridors within an extensive Study Area centered on the existing E5/F6 ROW to ensure that no clearly superior route alternatives to the Existing Lines were overlooked. Using the route evaluation criteria, NEP screened potential linear corridors and eliminated local roadway networks, highways, railroads, and other overhead transmission line corridors because the existing E5/F6 corridor is clearly superior and best balance considerations of reliability and minimization of environmental impacts and cost. Therefore, the existing E5/F6 corridor is proposed as the Project Route (Figure 4-9). Specifically, the Project Route provides the following benefits:

- The Project Route provides a direct route between the Deerfield #4 Substation and Millbury #305 Substation and rebuilding the Existing Lines within their existing ROWs will maintain system function and service to the 26 communities they currently serve. Although several route options could be delineated using existing linear corridors within the Study Area, none would be shorter, less costly, or have less overall impact to the human and natural environments, while still maintaining the existing function of the transmission lines.

- The Existing Lines have been situated along the proposed Project Route since the early 1900's, and the Tap Lines are also well established and maintained NEP assets. As such, the existing E5/F6 ROW has been historically accessed and maintained for the purpose of NEP's operations. Maintaining system operability and reliability has included vegetation maintenance, placing temporary construction mat crossings within existing wetland systems crossing the ROW, and accessing and performing repairs where assets are located within EJ communities. While access route improvements will be necessary as part of the Project, utilizing the existing E5/F6 ROW offers the benefit of an established network of access routes and lands already encumbered for this use.
- While the Project Route will require expansion of existing transmission line ROW to accommodate specific new pole and wire locations on up to 15 properties, as well as additional rights for four access easements for Project construction, the need to acquire land or land rights is minimal compared to potential route options evaluated.

4.6 Conclusion

NEP's process for selecting the Project Route for the proposed Rebuilt Lines and Tap Lines addresses the Siting Board's standards applicable to jurisdictional energy facilities in an objective and comprehensive fashion. NEP approached the process by identifying existing linear corridors within a broad routing Study Area to fulfill a review of potential route alternatives. Providing significant consideration to the unique scope of the Project and the significant length, cost, and reliability concerns, the route evaluation satisfied NEP's responsibility to ensure that no clearly superior route was overlooked. As a result of the in-depth screening process, no candidate routes were found to meet the route evaluation criteria and/or provide benefits comparable to rebuilding the Existing Lines and Taps within their existing ROWs, the Project Route.

While it is feasible to construct the Project using alternative routes consisting of existing linear corridors, this would result in increased costs, schedule delays, and new and/or increased impacts to human and natural environments. Developing and proposing an alternative route over 69 miles for which public notice would be given ("Noticed Alternative Route") would require a significant expenditure of funds and would unnecessarily raise concerns among a new set of abutters along an inferior route where NEP has no intention of constructing the Project. Thus, NEP determined that designating a Noticed Alternative Route was not warranted under these circumstances.

A more detailed examination of the Project Route is presented in *Section 5* of this Application.

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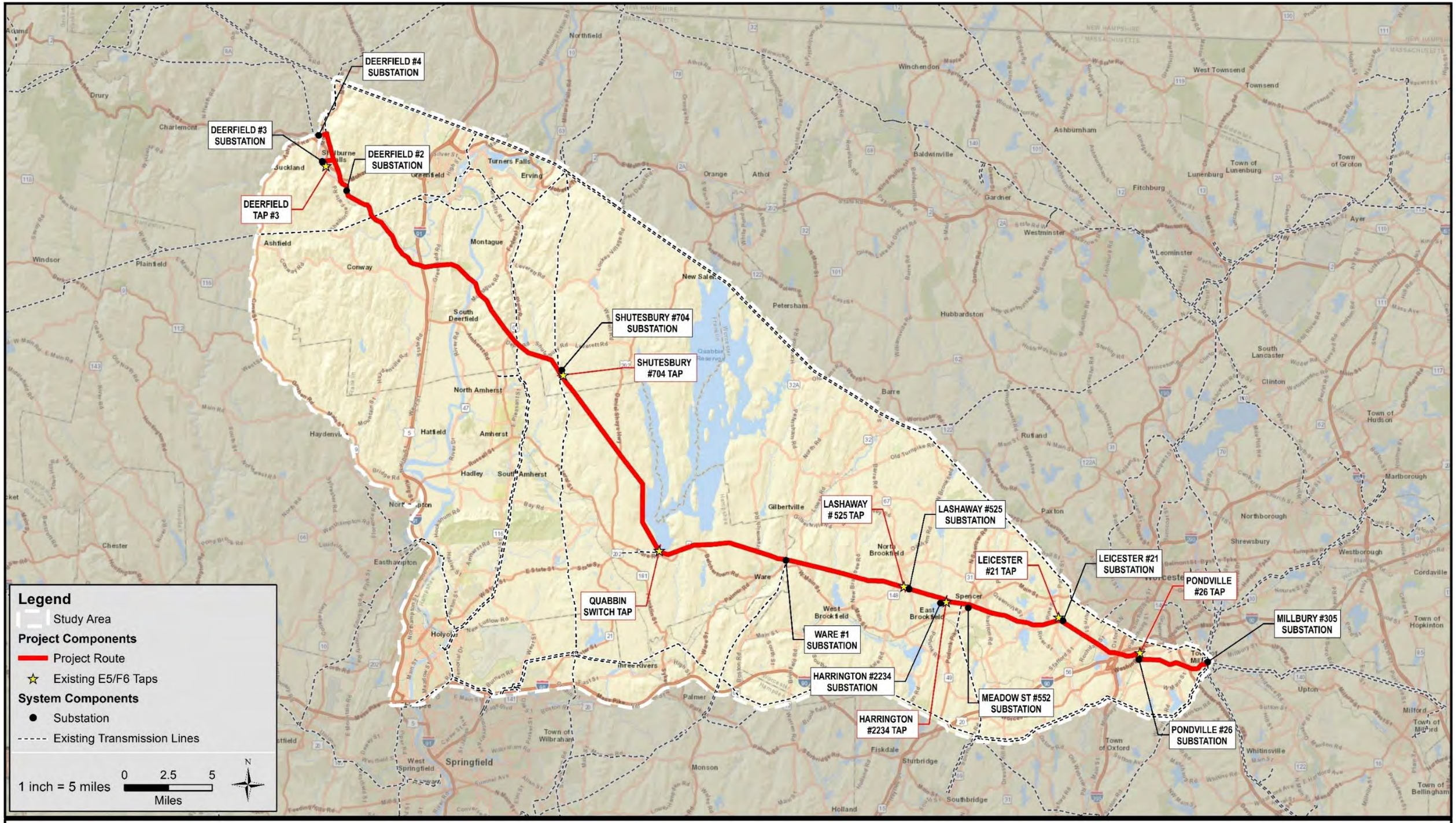

Central to Western Massachusetts Energy Improvement Project

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Figure 4-9
Project Route