Western Massachusetts Gas Reliability Project

Analysis to Support Petition before the Energy Facilities Siting Board

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LIST OF ACRONYMS/SYMBOLS

AUL	Activity Use Limitation
BMPs	Best Management Practices
CECP	Clean Energy and Climate Plan
CNG	Compressed Natural Gas
Company	Eversource Energy
dBA	A-weighted decibels
Department	Department of Public Utilities
EEA	Energy and Environmental Affairs
EFSB	Energy Facilities Siting Board
EGMA	Eversource Gas of Massachusetts
EJ	Environmental Justice
ENF	Environmental Notification Form
EOEEA	Executive Office of Energy and Environmental Affairs

EPG	Emergency Preparedness Group
Eversource	Eversource Energy
FERC	Federal Energy Regulatory Commission
F&SP	forecast and supply plan
GHG	greenhouse gas
GWSA	Global Warming Solutions Act
HDD	horizontal directional drilling
LHD	Local Historic District
LNG	Liquified Natural Gas
MACRIS	Massachusetts Cultural Resource Information System
MCFH	thousand cubic feet/hour
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
MHC	Massachusetts Historical Commission
NCE	non-capacity exempt
NHESP	Natural Heritage and Endangered Species Program
NOI	Notice of Inquiry
NRHP	National Register of Historic Places
POD	point of delivery
Project	Western Massachusetts Gas Reliability Project
PVTA	Pioneer Valley Transit Authority
RIPUC	Rhode Island Public Utilities Commission
ROW	Right of Way
TGP	Tennessee Gas Pipeline Company, L.L.C.
TPY	Tons per Year
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Services
USGS	U.S. Geological Survey
WC	Water Column
+	Superior
-	Inferior
=	Equal

1.0 PROJECT OVERVIEW

1.1 Summary of Project Description

Pursuant to G.L. c. 164, § 69J, Eversource Gas Company of Massachusetts d/b/a Eversource Energy ("Eversource" or the "Company") submits this analysis ("Analysis") to the Energy Facilities Siting Board (the "Siting Board") in support of its petition for authority to undertake the "Western Massachusetts Gas Reliability Project" (the "Project") to construct 5.3 miles of new 16-inch gas pipeline in the Town of Longmeadow and the City of Springfield. The work includes construction of a new point of delivery ("POD") in the Town of Longmeadow ("Longmeadow") to receive natural gas from Tennessee Gas Pipeline Company, L.L.C. ("TGP") and the upgrading of the Company's Bliss Regulator Station in Springfield. The Company will install equipment at the meter station to be constructed by TGP in Longmeadow for the distribution of natural gas from TGP's interstate system to this area of western Massachusetts.[1] The proposed Project is designed to ensure continued reliability of natural gas distribution to customers in Western Massachusetts by providing gas from a new source at a new POD and delivering it via a proposed gas line to the Bliss Street Regulator Station. The Company's proposed Project includes: (1) installation of POD equipment at the TGP meter station to be constructed in Longmeadow; (2) installation of approximately 5.3 miles of new 16-inch pipeline in Longmeadow and Springfield; and (3) Bliss Street Upgrades to allow interconnection of the Project to the existing distribution system serving the Greater Springfield Area.

The Project will establish a new, direct and resilient source of natural gas into the distribution system serving the Greater Springfield Area, which is currently exposed to significant supply contingencies. By addressing these supply contingencies, it will greatly improve supply security and system reliability to customers on both sides of the Connecticut River by: (1) providing an independent supply of natural gas needed during peak periods; (2) facilitating maintenance and leak response operations for other natural gas facilities in the surrounding area; (3) reducing the risk associated with the existing pipeline, which is vulnerable to external forces, such as third-party damage, earth movement, natural disasters, and structural failures of the bridge; material failure of the pipeline and associated equipment; and loss of upstream supply; and (4) mitigating the existence, duration, and consequences of outages that could otherwise result from the aged, current single-source system.

1.1.1 Schedule

Construction of the Project along the Preferred Route, as defined below, is anticipated to take approximately 18 months and will be scheduled during times when demand on the natural gas system is low (e.g., spring, summer and fall months). Typical daily construction hours will extend from 7:00 a.m. to 4:00 p.m., Monday through Friday in Springfield and 7:30 to 3:00 pm in Longmeadow. Nighttime work will be minimized and performed only on an as-needed basis, such as when crossing a busy road or during

[1] TGP has an exclusive easement for the property upon which the POD will be located and will be constructing its portions of the POD pursuant to its blanket construction certificate of public convenience and necessity from the Federal Energy Regulatory Commission ("FERC"). Tennessee Gas Pipeline Co., 20 FERC ¶ 62,409 (1982).

potential horizontal directional drilling ("HDD") operations on I-91. When needed, such extended construction hours will be coordinated in advance through the appropriate municipality. Pressure testing and gassing-in of the new main line may require work throughout the night, which will also be coordinated with the municipalities.

1.1.2 Cost

The Company's current cost estimate for the construction associated with the Preferred Route is $60.1 million (+50%/-25%), respectively, with another approximately $5 million in cost for construction of the meter station and associated facilities at the Longmeadow POD that is common to all routes. A detailed cost analysis for alternative routes is provided in Section 4.

1.2 Project Need

As a local natural gas distribution company, Eversource's core obligation is to provide safe, reliable, and least-cost gas service to its customers. The Project is needed to provide necessary system reliability and supply security to areas of Agawam, West Springfield, Southwick, Springfield, Longmeadow, East Longmeadow and Chicopee ("Greater Springfield Area"), which are currently served by a single, aged pipeline system. During cold winter periods, the Company's gas system from the Agawam Gate Station and across the Memorial Avenue Bridge in Springfield is the single source of supply for approximately 58,000 customers, consisting of approximately 40,000 customers on the east side of the Connecticut River and 18,000 customers west of the Connecticut River. If there is an interruption of supply along this pathway for any reason, customers served via the facilities along this route could be out of service for the duration of the interruption. This would be particularly problematic during a cold weather period. If such a contingency occurred on the west side of the Connecticut River, all 58,000 customers (which encompasses over 200,000 people) could lose gas service for an extended period of time lasting weeks or even months. If the contingency occurred on the east side of the Connecticut River, 40,000 customers (encompassing over 138,000 people) would lose gas service. Within this potentially affected area, there are a significant number of sensitive customer loads, such as public safety entities, hospitals, long-term care facilities, government offices, transportation centers and universities. Additionally, there are also approximately 1,900 commercial properties (including supermarkets, hotels, medical offices and retail stores) and 245 industrial properties (such as manufacturing plants, warehouses, office buildings and electric generation plants).

Because there is no alternative way to serve these customers in the event of certain foreseeable contingencies, customers would be without natural gas service for an extended period while the Company implements emergency response and outage restoration plans. Depending on the availability of mutual aid crews from outside the region, the Company estimates that it could take approximately eight weeks or more to restore service to 58,000 customers on both sides of the Connecticut River in the event of an outage. Based upon recent restoration efforts, it is estimated that the cost associated with such a restoration process could be at least $130 million. However, once constructed, the Project will offer an independent, reliable source of supply to customers east and west of the Connecticut River and ensure that gas service is not lost in the event of such a contingency.

1.3 Project Alternatives

Eversource evaluated a number of potential alternatives to the Project, including non-pipeline and pipeline alternatives, including: (1) no-build alternative; (2) the proposed Project; (3) alternative POD locations; (4) use of Compressed Natural Gas ("CNG") or Liquified Natural Gas ("LNG"); and (5) non-pipeline alternatives and emerging technologies, such as energy efficiency. Eversource analyzed these potential alternatives according to their ability to meet the identified Project need as well as considerations of reliability, cost and environmental impacts. As demonstrated in Section 3, the Company's analysis shows that the Project is the superior alternative and solution to satisfy the Project need, while also appropriately balancing reliability, cost, and environmental impacts.

1.4 Preferred Route and Alternative Routes

The Company's route selection process involved the following primary steps:

- Identify a study area for route selection;
- Identify and screen potential routes and route variations that would connect to the Project start and endpoints;
- Identify candidate routes for scoring based on construction and environmental criteria; and
- Select a Preferred Route, Route Variations and a Noticed Alternative Route based on cost, reliability, and environmental impacts.

Eversource's routing analysis included a detailed assessment of environmental impacts, human use impacts and constructability issues. Based upon this assessment, the Company identified a Preferred Route, with variations, and a Noticed Alternative Route.

1.5 The Preferred Route

The Preferred Route begins at the Longmeadow POD and extends north and west within streets of the Town of Longmeadow (e.g., north on Shaker Road and Laurel Street, west on Converse Street, and then north on Longmeadow Street). The Route then extends around the western side of Forest Park within the I-91 right-of-way ("ROW"). After passing west of Forest Park, the route turns back eastward on Longhill Street and extends north along Longhill Street, west on Main Street, and north on Hall of Fame Avenue to the Bliss Street Regulator Station.

1.5.1 Variation to the Preferred Route – No. 1 (Williams Street Variation)

This variation to the Preferred Route follows the path of the Preferred Route from the Longmeadow POD, but then diverges west on to Williams Street and then extends north on Longmeadow Street until it intersects back into the Preferred Route again at Converse Street. From that point, it follows the path of the remainder of the Preferred Route.

1.5.2 Variation of the Preferred Route – No. 2 (Forest Park Variation)

This variation of the Preferred Route begins in Longmeadow at the proposed Longmeadow POD off Hazardville Road. The route then extends north along Shaker

Road, crosses Williams Street, and continues north along Laurel Street to Forest Glen Road. The route then extends west along Forest Glen Road and then extends north into Forest Park via a foot path through a forested area closed to traffic (e.g., South Magawiska Road) which transitions to a park roadway for vehicles (North Magawiska Road) until it reaches the north side of the park. Once north of the park, the route follows the path of the Preferred Route to its terminus at the Bliss Street Regulator Station.

1.6 Noticed Alternative Route

The Noticed Alternative Route begins at the Longmeadow POD and heads north along Shaker Road, turns northeast on Converse Street, extends northeast along Dickenson Street, turns west on Cliftwood Street, and then extends northwest until it reaches Sumner Avenue. At Sumner Avenue, the route then extends west to the intersection of Longhill Street and follows East Columbus Avenue north to State Street, turns west under I-91 and then south on East Columbus until it reaches the Bliss Street Regulator Station.

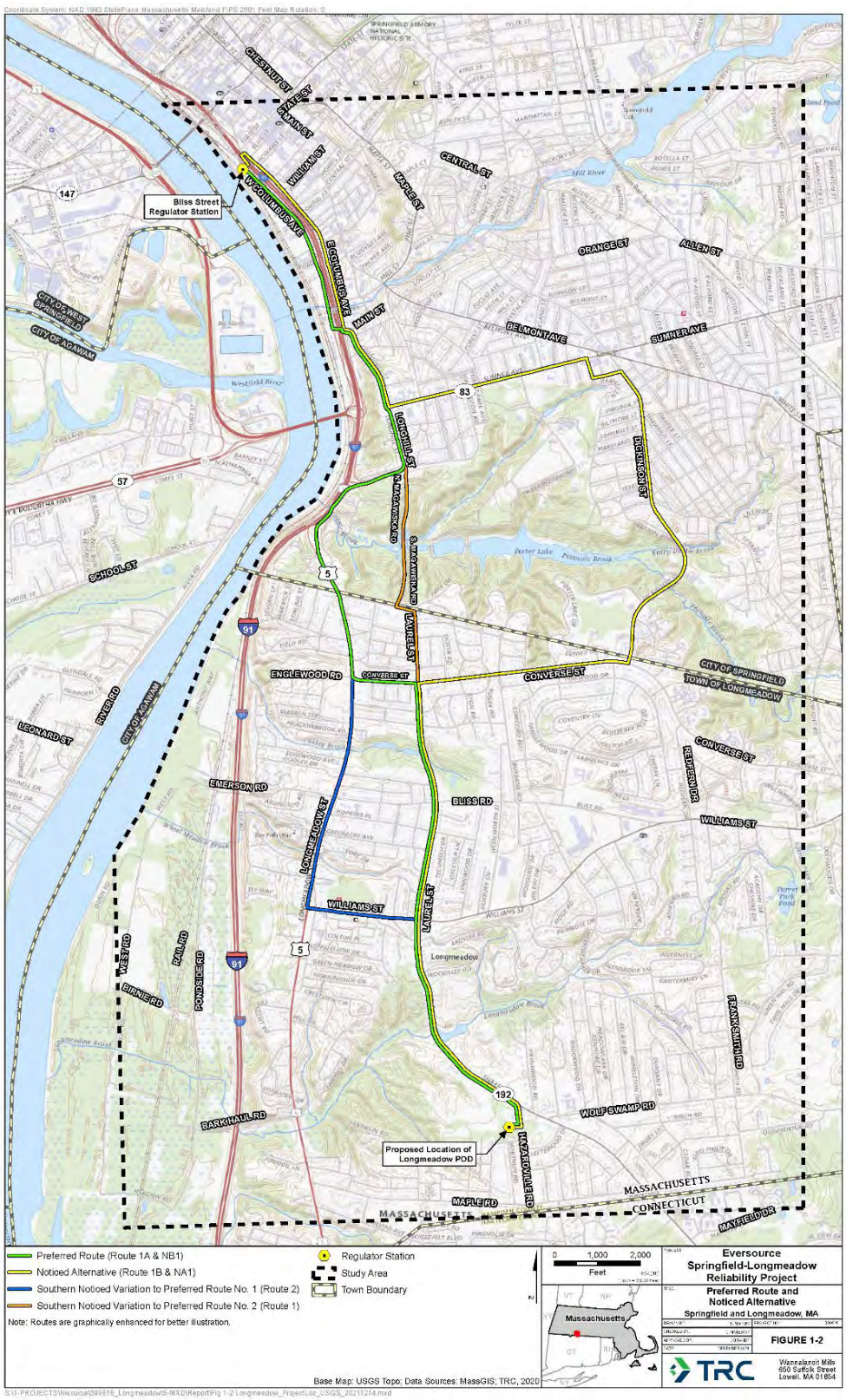
Eversource's route selection process is discussed further in Section 4. Based on the evaluation of data collected and analyzed, the Preferred Route achieves the best balance of reliability, minimizing cost and minimizing environmental impacts in accordance with Siting Board standards.

1.7 Introduction: Siting Board Jurisdiction

This Analysis describes in detail the Project scope, the need for the Project, the evaluation of pipeline and non-pipeline project alternatives, routing alternatives, environmental and community impacts, mitigation, and a demonstration of the Project's consistency with applicable state policies in support of its petition pursuant to G.L. c. 164, § 69J ("Section 69J Petition"). Construction of the Project will serve the public interest by increasing the reliability of the regional gas distribution system. Consistent with the Siting Board's standards, the Project will provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. In addition, the Company is also seeking zoning exemptions for its POD equipment in Longmeadow pursuant to G.L. c. 40A, § 3.

A U.S. Geological Survey ("USGS") location map of the Project facilities, including all potential routes before the Siting Board, is provided on Figure 1-1 and Project Overview Map overlaid on an aerial photo is provided on Figure 1-2 (see below and in Attachment A). Additionally, aerial-based alignment sheets of the Preferred Route, Route Variations and the Noticed Alternative Route are shown on Figure 1-3, in Attachment A.


Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet Map Rotation: 0
Bliss Street Regulator Station
Proposed Location of Longmeadow POD
Connecticut River
CHESTNUT ST
STATE ST
MAIN ST
WILLIAMS ST
CENTRAL ST
MAPLE ST
W COLUMBUS AVE
E COLUMBUS AVE
ORANGE ST
ALLEN ST
MAIN ST
BELMONT AVE
SUMNER AVE
CITY OF WEST SPRINGFIELD
CITY OF AGAWAM
LONGHILL ST
DICKINSON ST
N MAGAWISKA RD
S MAGAWISKA RD
SCHOOL ST
LAUREL ST
ENGLEWOOD RD
CONVERSE ST
CITY OF SPRINGFIELD
TOWN OF LONGMEADOW
RIVER RD
LEONARD ST
REDFERN DR
EMERSON RD
BLISS RD
LONGMEADOW ST
WILLIAMS ST
WEST RD
RAIL RD
PONDSIDE RD
BIRNIE RD
FRANK SMITH RD
WOLF SWAMP RD
BARK HAUL RD
HAZARDVILLE RD
MAPLE RD
MASSACHUSETTS
CONNECTICUT
MAYFIELD DR
147
57
83
5
91
192
Preferred Route (Route 1A & NB1)
Noticed Alternative (Route 1B & NA1)
Southern Noticed Variation to Preferred Route No. 1 (Route 2)
Southern Noticed Variation to Preferred Route No. 2 (Route 1)
Note: Routes are graphically enhanced for better illustration.
Regulator Station
Study Area
Town Boundary
Base Map: USGS Color Ortho Imagery, MassGIS 2019; Data Sources: MassGIS; TRC, 2020
0 1,000 2,000
Feet
Massachusetts
Eversource
Springfield-Longmeadow
Reliability Project
Preferred Route and
Noticed Alternative
Springfield and Longmeadow, MA
FIGURE 1-1
TRC
Wannalancit Mills
650 Suffolk Street
Lowell, MA 01854


Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet Map Rotation: 0
Bliss Street Regulator Station
Proposed Location of Longmeadow POD
W COLUMBUS AVE
COLUMBUS AVE
CHESTNUT ST
STATE ST
MAIN ST
WILLIAM ST
MAPLE ST
CENTRAL ST
ORANGE ST
ALLEN ST
BELMONT AVE
SUMNER AVE
MAIN ST
LONGHILL ST
DICKINSON ST
N MAIN ST
S MAIN ST
LAUREL ST
SCHOOL ST
CONVERSE ST
ENGLE WOOD RD
CITY OF SPRINGFIELD
TOWN OF LONGMEADOW
CITY OF WEST SPRINGFIELD
CITY OF AGAWAM
RIVER RD
LEONARD ST
EMERSON RD
LONGMEADOW ST
BLISS RD
REDFERN DR
WILLIAMS ST
WEST RD
RAIL RD
PONDSIDE RD
BIRNIE RD
BARKHAUL RD
WOLF SWAMP RD
FRANKSMITH RD
HAZARDVILLE RD
MAPLE RD
MAYFIELD DR
MASSACHUSETTS
CONNECTICUT
Longmeadow
Preferred Route (Route 1A & NB1)
Noticed Alternative (Route 1B & NA1)
Southern Noticed Variation to Preferred Route No. 1 (Route 2)
Southern Noticed Variation to Preferred Route No. 2 (Route 1)
Note: Routes are graphically enhanced for better illustration.
Regulator Station
Study Area
Town Boundary
0 1,000 2,000
Feet
Base Map: USGS Topo; Data Sources: MassGIS; TRC, 2020
Eversource
Springfield-Longmeadow Reliability Project
Preferred Route and Noticed Alternative
Springfield and Longmeadow, MA
FIGURE 1-2
TRC
Wannalancit Mills
650 Suffolk Street
Lowell, MA 01854

The balance of Section 1 presents an overview of the Project and alternatives considered by the Company. Subsequent sections provide detailed information to support the Project, specifically: Project Need (Section 2); Project Alternatives (Section 3); Route Selection (Section 4); Evaluation of Preferred Route, Noticed Alternative Route and Route Variations (Section 5); and Consistency with the Policies of the Commonwealth (Section 6).

1.8 Summary of Project Impacts

The minimization of Project-related impacts is discussed in detail in Section 5. Eversource will mitigate the Project's construction impacts to the greatest extent practicable. Mitigation measures contemplated by Eversource include soil management best management practices ("BMPs") to minimize the quantity and duration of soil exposure; protecting sensitive areas by redirecting and reducing the velocity of runoff; installing, maintaining, and inspecting erosion and sediment control measures; implementing traffic details; re-establishing vegetation where applicable; and re-storing roadways to pre-construction or better conditions. Eversource will also utilize temporary sediment control barriers prior to initial disturbance of soil and maintain the use of these control barriers until final stabilization is achieved.

Construction of the Project will result in a minor, temporary increase in air emissions of some pollutants due to the use of equipment powered by diesel fuel or gasoline engines. Construction activities may also result in the temporary generation of fugitive dust due to disturbance of the ground surface and other dust generating actions. The Company will therefore implement appropriate mitigation, including the use of water trucks for dust suppression, restrict trucks on site from idling, require cars and trucks to have state mandated emission controls, and encourage workers to carpool, if possible, to minimize indirect emissions from workers driving to the site.

In-street construction will be scheduled for work within roadways and specific crossings to minimize impacts on commuter traffic. Appropriate traffic management and signage will be implemented, and necessary safety measures will be developed in compliance with applicable permits for work in the public roadway. Arrangements will be made with local officials to have traffic safety personnel, police details, and/or qualified and trained flaggers available during periods of construction.

1.9 Safety

Eversource implements a comprehensive maintenance and inspection program and an effective leak management program, which exceed the requirements of federal and state pipeline safety regulations (see Attachments C and D). In fact, construction, operations and maintenance work at Eversource must comply with regulations required by the Natural Gas Pipeline Act of 1968, along with various amendments, which ensure public safety and reliability. Eversource also complies with other regulatory initiatives designed to improve pipeline safety such as the Distribution Integrity Management Program and Transmission Integrity Pipeline Management Program.

Eversource is committed to safety, protecting the environment, preventing accidents/incidents, and maintaining the highest standards for its pipeline operation and maintenance. Eversource will accomplish this goal through routine preventative

maintenance, pipeline patrols, emergency response plans and a pipeline integrity management program. Eversource will establish and maintain strict operating and maintenance policies and procedures. Trained and qualified pipeline personnel will operate and maintain the pipeline in accordance with applicable regulations. The training program will ensure all personnel possess the knowledge and competency necessary to efficiently operate and maintain the pipeline in a manner that protects the environment, the public and the health and safety of all employees. More specifically, personnel are trained to execute normal operating and maintenance procedures; recognize abnormal conditions and take appropriate corrective actions; predict consequences of malfunctions or failures; recognize conditions likely to cause emergencies; respond to emergency situations; control accidental releases of gas; and recognize characteristics and hazards of gas, to ensure the safe and reliable operation of its natural gas system.

During construction, special care will be taken in residential and commercial areas to minimize neighborhood and traffic disruption, to control noise and dust to the extent practicable, and to protect the public at large. Measures to be implemented where the pipeline traverses near residential areas include, but are not limited to:

- Fencing the construction work area boundary to ensure construction equipment, materials, and spoils remain in the construction ROW;
- Ensuring piping is welded and installed as quickly as reasonably possible consistent with prudent pipeline construction practices to minimize construction time affecting a neighborhood;
- Backfilling the trench as soon as the pipe is laid or temporarily steel plating the trench; and
- Completing final cleanup and installation of permanent erosion control measures within 10 days after the trench is backfilled, weather conditions permitting.

No trench will remain open overnight in residential and commercial areas. The installed pipe will be backfilled to near the end of the section, and the remaining open trench will be covered with temporary steel plating. The work will be accomplished so that emergency vehicle access to nearby residences will be maintained by backfilling immediately and or installing steel plating over the trench-line. Steel plates will also be available to ensure homeowners are able to access to their driveways. Eversource will coordinate with residents while construction activities are underway.

1.10 Construction Overview

Construction work will include trenching, dewatering, laydown/staging, welding, backfilling, cleanup and restoration. Trenching operations will be completed using standard industry construction practices and in a manner that eliminates unnecessary environmental and traffic impacts. A trench will be excavated by a backhoe or excavator to the proper depth to allow for the burial of the pipe. The footprint for the trench will be typically 24-36 inches wide by four to five feet deep.

Constructing the Project within and across public roadways using the conventional open cut method will be based on site conditions and any applicable road opening permit requirements. Roadway opening permits will be sought from Longmeadow and Springfield. Conditions of any such permits will determine day-to-day construction

activities within roadways and at road crossings. In order to minimize impacts to I-91 and associated traffic, the Company is investigating using HDD to perform work on I-91 as well as open cut installation.

No direct impact on wetlands or waterbodies are anticipated during construction of the Project. Where wetlands and waterbodies are located near the limits of disturbance, Eversource will install erosion and sediment controls prior to soil disturbance and will inspect and maintain erosion and sediment controls throughout the duration of construction in accordance with its BMPs.

1.11 Community, Stakeholder and Environmental Justice Outreach

Eversource has been actively consulting with state agencies, affected municipalities, community-based organizations, local residents in the area of impact, and advocacy groups regarding permitting and Project updates. A list of meetings conducted to date with municipalities and state agencies is provided in Table 1-1, below. Eversource plans to maintain an active level of consultation and outreach as the design effort continues and the Project enters the licensing and permitting phase.

Table 1-1. Communications with Agencies and Stakeholders

Type	Agency / Contact	Meeting Date
State Agencies & Offices	MassDOT	11/09/2021, 4/11/22
	DCR	5/17/2021
	MEPA	01/06/2021
	EFSB	8/25/2021
	Congressman Richard Neal's Office	11/03/2021
	State Senator Adam Gomez' Office	02/05/2021, 09/01/2021, 11/5/21
	State Senator Eric Lesser's Office	08/25/2021
	State Senator John Velis Office	09/13/2021
	State Rep. Brian Ashe Office	08/30/2021
	State Rep. Angelo Puppolo Office	08/25/2021
	State Representative Michael Finn	08/25/2021
	State Representative Orlando Ramos	08/23/2021, 11/5/21
	State Representative Carlos Gonzalus	11/05/2021
	Western Massachusetts Governor's Office	07/30/2021
Municipalities	Agawam	7/13/2021
	Chicopee	07/30/2021
	East Longmeadow	08/17/2021
	Longmeadow	12/03/2021,03/17/2021,6/09/21, 11/15/21
	Springfield Officials - Mayors Office, DPW Office, City Council, EMD	12/08/2020,03/17/2021, 06/11/21, 10/14/21, 10/22/21
	West Springfield	07/14/2021
	Southwick	08/11/2021
	Baystate Health	07/02/2021

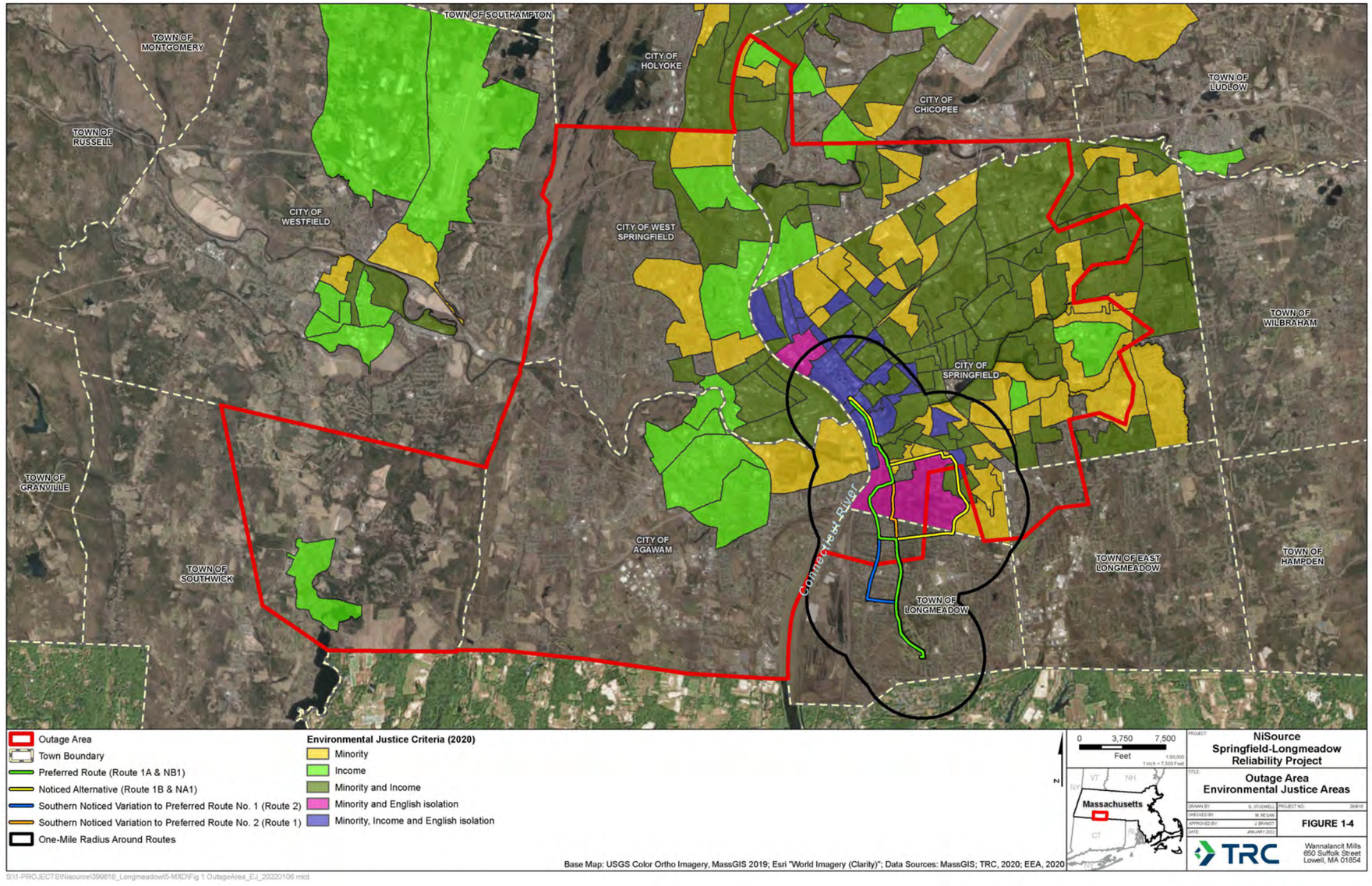
Table 1-1. Communications with Agencies and Stakeholders		
Community Groups	Mercy Medical (Trinity Health)	08/16/2021
	Shriners Hospital	09/01/2021
	Springfield Parks and Springfield Garden Club	08/10/2021
	Springfield Regional Chamber of Commerce	07/02/2021,10/26/21,11/4/21, 11/12/21
	Western Mass EDC	07/23/21
	Western Mass EDP	9/23/21
	Springfield Technical Community College	8/16/21
	Multicultural Resource Center	3/4/22
	Council of Churches of Western MA	5/2/22
	Develop Springfield	07/16/2021
	Partners for Community	11/03/2021, 3/22/22
	Springfield City Council (S&E Committee)	10/14/2021
	Springfield Climate Justice Coalition	09/13/2021
	Springfield Housing Authority	08/17/2021
	Longmeadow Pipeline Awareness Group	02/25/2021, 9/13/2021
	Columbia Gas Resistance Campaign	02/25/2021
Virtual Open Houses	Night Session	11/09/2021
	Day Session	11/10/2021
Community Pop-up Events	Hispanic American Library/Union Station Springfield	3/28/22
	Old San Juan Bakery in Springfield	4/1/22, 4/2/22
	Eastfield Mall in Springfield	4/6/22, 4/29/22, 5/6/22

The portion of the Project that is in Springfield is in a Mapped Environmental Justice ("EJ") community with respect to low income, minority populations, and English-language isolation groups (see Figure 1-4). The Company has identified affected EJ communities through an overlay of the proposed line routes on the Commonwealth of Massachusetts' interactive map produced to reflect the Climate Act (see 2020 EJ Population Map at: https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=1d6f63e7762a48e5930de84ed4849212

The Project need is focused on ensuring resiliency of the existing gas supply throughout the Greater Springfield Area including, in large part, these EJ communities in Springfield. Thus, the Project will directly benefit EJ populations within Springfield. Figure 1-4 shows the Greater Springfield Area with EJ areas marked by kind (minority, income, English-language isolation, etc.). The red outline in the figure shows the extent of the geographical area that would be without natural gas service in the event of a contingency (as described in more detail in Section 2), which includes a significant amount of EJ populations across several municipalities.

The Project, including the Preferred and Noticed Alternative Routes, as well as potential variations, is also shown and, it should be noted, is located substantially within the anticipated area of outage. Eversource has designed the Project and developed mitigation to minimize impacts to all abutters and stakeholders, including the EJ

populations in Springfield and the non-EJ areas of Longmeadow, during the construction and operation of the Project (see Section 5).


TOWN OF MONTGOMERY
TOWN OF SOUTHAMPTON
CITY OF HOLYOKE
TOWN OF LUDLOW
CITY OF CHICOPEE
TOWN OF RUSSELL
CITY OF WESTFIELD
CITY OF WEST SPRINGFIELD
TOWN OF WILBRAHAM
CITY OF SPRINGFIELD
TOWN OF GRANVILLE
CITY OF AGAWAM
TOWN OF SOUTHWICK
Connecticut River
TOWN OF EAST LONGMEADOW
TOWN OF HAMPDEN
TOWN OF LONGMEADOW
Outage Area
Town Boundary
Preferred Route (Route 1A & NB1)
Noticed Alternative (Route 1B & NA1)
Southern Noticed Variation to Preferred Route No. 1 (Route 2)
Southern Noticed Variation to Preferred Route No. 2 (Route 1)
One-Mile Radius Around Routes
Environmental Justice Criteria (2020)
Minority
Income
Minority and Income
Minority and English isolation
Minority, Income and English isolation
0 3,750 7,500
Feet
1 inch = 7,500 Feet
N
VT
NH
NY
Massachusetts
CT
RI
NiSource
Springfield-Longmeadow
Reliability Project
Outage Area
Environmental Justice Areas
FIGURE 1-4
TRC
Wannalancit Mills
650 Suffolk Street
Lowell, MA 01854
Base Map: USGS Color Ortho Imagery, MassGIS 2019; Esri "World Imagery (Clarity)"; Data Sources: MassGIS; TRC, 2020; EEA, 2020
S:\1-PROJECTS\Nisource\399616_Longmeadow\5-MXD\Fig 1 OutageArea_EJ_20220106.mxd

1.11.1 Open Houses

Eversource has also consulted with abutters and customers who may be affected by the Project to keep them informed of the Project schedule. Eversource held two virtual open houses on November 9th and 10th in 2021. The informational virtual open houses were held to acquaint landowners and public officials with the Project, answer their questions, and gather input. The Company provided notice of these virtual open houses on its website, via mailings, door-to-door outreach and conversations with local officials and community groups. With respect to publishing public notices in newspapers about the hearings, the Project's open houses were noticed in the: Agawam Advisor (5,200 copies issued); Chicopee Register (13,000 copies issued); East Longmeadow Reminder (25,554 copies issued); Springfield Republican (46,516 copies issued the first time) and then a second time in the Springfield Republican (31,162 copies issued). The Company provided live simultaneous Spanish translation services at these open house events to ensure language access for the residents of the communities, including EJ areas, through which the Project will traverse. Further, these virtual open houses mixed time-of-day and day-of-week opportunities for the public to interact with Project subject matter experts, ask questions and share concerns. At the virtual open houses, the Company provided information on the need for and benefits of the Project, described the siting process, explained the route selection process, and provided detail on Project design and location, schedule, and construction activities. The Company mailed post card invitations and letters to property owners within a ¼ mile of the proposed POD and Bliss Street Regulator Station as well as all abutters within 300 feet from the Preferred and Noticed Alternative Routes and all variations. The Company conducted door-to-door outreach to properties within the Preferred and Noticed Alternative Routes and variations, targeting locations where tenants might reside to ensure they received notification and to personally them to learn more about the proposed Project.

The Company will maintain its outreach efforts throughout 2022 and throughout the siting process to the start of construction, with specific focus on EJ communities. The Company has, and will continue to, conduct door-to-door outreach to properties within the Preferred and noticed Alternative Routes and variations, to inform them of the proposed Project. The Company is also planning additional outreach events in the local community.

Discussions will include the proposed Project scope and timing, soliciting feedback about line routes, opting in for future Project notifications, encouraging participation in future events, and translation services, where appropriate. During construction, outreach will focus on neighbors and abutters where construction work is being conducted. These in-community events will include Project information and map boards, printed in multiple languages and live translation services for non-English speaking residents.

1.11.2 Popup Events and Outreach

Beginning in early 2022, the Company also engaged in targeted public outreach in EJ communities within one mile of the proposed pipeline routes with a Spanish speaking team-member engaging the public and providing translation services. To that end, the Company held a "pop up" event at Hispanic American Library at Union Station in Springfield on March 28th from approximately 4:00 p.m. to 6:45 p.m., including a presentation at the library. That evening, members of the Project team participated in approximately 30 interactions with members of the public on the topics of need, gas supply and potential bill impacts. The Company held two similar "pop up" events at the Old San

Juan Bakery in Springfield on April 1 and 2, from 11:00 a.m. to 1:00 p.m. At these two events, Project team representatives engaged in approximately 50 interactions with residents and business owners in the area, including portions of Springfield, Chicopee, Holyoke and Agawam. Last, the Company held three "pop up" events at the Eastfield Mall in Springfield on April 16th and 29th and May 6th in the mid-afternoon and early evening. Company representatives engaged in over 60 interactions at each of these events with members of the public on a wide range of topics including need, climate change initiatives, construction impacts, potential route options, safety concerns and public transportation coordination.

To ensure different organizations within the local and regional EJ communities were reached, the Company has had interactions with the Multicultural Resource Center of Massachusetts to share translated fact sheet with Russian Church leaders in West Springfield and surrounding areas. The Company has also engaged Hispanic Market Services ("HMS"), a Hispanic consultation organization, to assist with ongoing outreach/relationship building with key community leaders, including Churches and charitable organizations

The Company also used traditional media outlets to provide information to the public. For example, the Company ran advertisements in both English and Spanish in the El Pueblo Latino newspaper for six weeks. These ads provided information on the Project including contact information for individuals to provide feedback and ask questions. The Company also produced an English/Spanish "flyer" which ran on Access Springfield TV, and also included details on how to provide Project feedback. A list of public outreach activities conducted by Eversource is provided in Attachment I.

1.11.3 Website

A website has been developed for this Project using multiple languages to ensure effective outreach to EJ populations. The website provides basic Project information, maps, regular updates, recordings of the Open Houses and contact resources. This website will be kept up to date for the duration of the Project and is available in English, Spanish, Portuguese, French and English. For more information about the Project, visit www.eversource.com/wma-gas-reliability.

1.11.4 Project Hotline

A toll-free number has been created as the Project Hotline. The Project Hotline number is listed in all Project outreach materials, including fact sheets, subsequent mailings, the website and at all community events. Eversource is committed to responding promptly to all inquiries, with appropriate language translation services. For more information about the Project, call 800-793-2202.

1.11.5 Project E-mail

An email address has been created and listed in all Project outreach materials, including fact sheets, subsequent mailings, the website and at all community events. Like the Hotline, Eversource is committed to responding promptly to all inquiries, with appropriate language translation services. For more information about the Project, send an email to **ProjectInfo@eversource.com.**

Project Team Contact Information: Contact information for project team members has been made available to the public. The Project team has engaged residents via telephone and email conversations to answer specific questions about the Project.

1.11.6 Construction Outreach Plan

Eversource will execute a comprehensive construction community outreach plan to keep EJ communities, property owners, businesses and municipal officials including fire, police, and emergency personnel, up to date on planned construction activities. The Company will notify abutting property owners, stakeholder groups and municipal officials of its planned construction start and work schedule prior to commencing construction and will work closely with both to limit construction impacts. Once the construction schedule is finalized, the Company will notify direct abutters of the hours of construction and address any concerns raised. All notifications will occur as soon as it is practicable. Typically, notification one to two weeks in advance of construction has proven to be sufficient on previous projects.

In consultation with property owners and local officials, the Company will also develop traffic management plans and will secure police details as necessary to control traffic and maintain safety along the construction route. The Company will provide a construction schedule to the municipalities for publication on their webpages (and/or provide a link to the Project webpage). Additionally, the Company will work with the local chamber(s) of commerce, neighborhood services, neighborhood groups and local business groups to ensure that Project updates and information will be available throughout the Project's duration. As needed, Project personnel will arrange for specific notifications to abutters along the route that might be adversely affected or have need for advanced notice of specific Project activities. The Company will distribute door hangers directly to abutter addresses, as needed. The Company will attempt to schedule optimum construction hours along the routes to minimize the adverse impacts to residents and businesses. Construction schedules (day, evening and/or early morning construction hours) will be coordinated to minimize adverse impacts to abutters and ensure optimal vehicle and truck traffic flow. If access to a property will be limited, specific arrangements will be made to avoid affecting abutter activities. If a lane closure or detour is deemed necessary for the underground line construction, this information will be posted on the Project website and local abutters will be advised of the alternate route and the expected duration and police details will be employed.

1.12 Massachusetts Environmental Policy Act Jurisdiction

The Massachusetts Environmental Policy Act ("MEPA") requires that state agencies study the environmental consequences of their actions, including permitting, financial assistance, or land transfer from state agencies. MEPA review is not a permitting process, but rather a public review and disclosure of potential impacts of a project and the development of feasible mitigation for such impacts. The information through the MEPA process allows state agencies and stakeholders to understand the scope of impacts of the project and ensures an opportunity to mitigate again project impacts.

MEPA review is required if a project involves state action *and* meets or exceeds one or more of the criteria listed in 301 CMR 11.03 (i.e., MEPA threshold). The Company's Project is subject to review under MEPA because construction of more than five miles of

new fuel pipeline is proposed (301 CMR 11.03(7)(b)(3)). The Project does not meet any other MEPA review thresholds identified in 301 CMR 11.03.[2] The state permits that trigger review include the Siting Board approval and State Highway Permit. On May 16, 2022, Eversource, through its consultant TRC Companies, Inc., filed an Environmental Notification Form ("ENF") with the Executive Office of Energy and Environmental Affairs ("EOEEA") for the Project.

1.13 Conclusion

Eversource seeks authority to construct the Project along its Preferred Route to fulfill its obligation to provide reliable natural gas distribution service in its service territory, specifically as it affects areas of Agawam, West Springfield, Southwick, Springfield, Longmeadow, East Longmeadow and Chicopee. Once constructed, the Project will offer a reliable source of supply to customers east and west of the Connecticut River and alleviate the need to completely rely on the older, more vulnerable Memorial Avenue Bridge system, supplied only from the Agawam Gate Station and a transmission-grade pipeline. Thus, in accordance with the Siting Board standards and precedent, the Project will contribute to a reliable supply of energy in the region, while also minimizing costs and environmental impacts.

[2] TGP sought MEPA authorization for two interstate natural gas projects (261 Upgrade Projects) and included references and information regarding its portion of the separate Longmeadow POD, all located in western Massachusetts in a separate MEPA process (File Number 15879). TGP received a Certificate from the Secretary of the Executive Office of Energy and Environmental Affairs ("EEA") on its Final Environmental Impact Report on August 2, 2019 (see Attachment E).

2.0 NEED FOR PROJECT

2.1 Introduction

The Project is needed to provide system reliability and a second, independent source of gas supply to areas of Agawam, West Springfield, Southwick, Springfield, Longmeadow, East Longmeadow and Chicopee ("Greater Springfield Area"), which are currently served by a single-feed, aged pipeline system. During cold winter periods, the Company's gas system from the Agawam Gate Station is fed via a transmission-grade pipeline that is the only source of supply for a total of approximately 58,000 customers, consisting of approximately 40,000 customers on the east side of the Connecticut River and 18,000 customers west of the Connecticut River. If there were an interruption of supply along this pathway for any reason, all customers served via facilities along this route could be out of service for the duration of the interruption. This would be particularly problematic during a cold weather period, such as a day reaching design-day conditions.[3] For example, a contingency on Eversource's system or the loss of upstream supply from TGP could cause all 58,000 customers served via this station on both sides of the Connecticut River to lose service for a prolonged period of time (e.g., several weeks).[4]

Once constructed, the Project will offer an additional source of supply and alleviate the need to rely on a single source from the Agawam Gate Station and a transmission-grade pipeline. Additionally, the Project will offer an additional source for customers located west of the Connecticut River in the event of an interruption from the Agawam supply point. For these reasons, the Company proposes, as a secondary source of supply, the Project, involving the installation and operation of approximately 5.3 miles of 16-inch coated-steel main between a new POD station in Longmeadow and the Company's Bliss Street Station in Springfield.

The Company will be installing POD equipment at TGP's meter station in Longmeadow for the distribution of natural gas from TGP's interstate system to this area of western Massachusetts. As described in Section 1, above, the Company's proposed Project includes: (1) installation of the Company's POD equipment at the TGP meter station in to be constructed in Longmeadow; (2) installation of approximately five miles of new 16-inch pipeline in Longmeadow and Springfield; and (3) Bliss Street Upgrades to allow interconnection of the Project to the existing distribution system serving the Greater

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[3] In planning and designing natural gas distribution systems, companies plan for customer demand over a hypothetical 24-hour period, or "design day," that is based on actual historic volume and temperature data that occurs during the probability of one day in 30 years.

[4] As noted in Section 1, the potential for outages to approximately 58,000 customers refers to the number of accounts the Company has for gas service in this area – including residential, commercial and industrial customers. Based on U.S. Census Data for the average number of people per household, the number of residents in this area that would be affected by a loss of gas service could reach 139,000. Moreover, the number of affected people impacted would be much greater, considering that the Greater Springfield area includes the economic centers of the communities served. Approximately 5,000 commercial and industrial businesses would be affected impacting a significant number of citizens, including area hospitals and colleges. As an example, there are over 1,000 hospital beds that could be affected and in excess of 10,000 students at the larger area colleges. Thus, the extent of people, businesses and institutions that are at risk from the consequences of a prolonged outage is many multiples of the 58,000 customers.

Springfield Area. The Project will establish a new, independent supply of natural gas into the distribution system serving the Greater Springfield Area. This will greatly improve supply security and system reliability to customers on both sides of the Connecticut River by: (1) providing an independent supply of natural gas that is needed during peak periods; (2) facilitating maintenance and leak response operations for other natural gas facilities in the surrounding area; (3) reducing the risk associated with the existing pipeline, which is vulnerable to external forces, such as third-party damage, earth movement, and structural failures of the bridge; material failure of the pipeline and associated equipment; and loss of upstream supply; and (4) mitigating the existence, duration, and consequences of outages that could otherwise result from the aged, current single-source system.

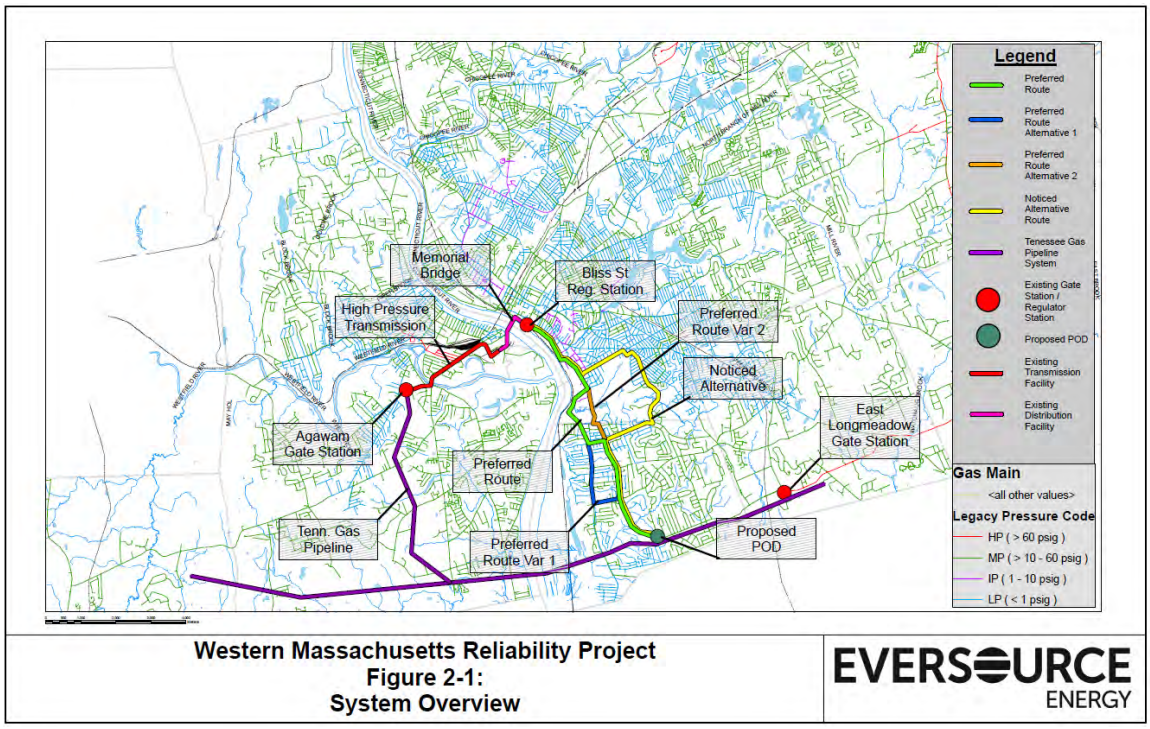
2.2 Description of System

2.2.1 Overview of the Company's Springfield Division

The Company's Springfield Division serves a total of approximately 110,000 customers in 16 municipalities, including the Greater Springfield Area. Natural gas supply to the entire Springfield Division originates from four PODs: (1) the Agawam Gate Station; (2) the East Longmeadow Gate Station; (3) the Monson-Palmer Gate Station; and the (4) Northampton Gate Station. This system consists of small diameter, networked pipelines of sizes ranging from two to eight inches and larger diameter distribution lines of 10- to 20-inch pipe. Operating pressures range from a low pressure of about 10 to 12 inches of water column ("WC") to a higher pressure of up to 500 psig. Pressure-reducing regulator stations are strategically located throughout the system to reduce high pressures, needed to transport large gas volumes to market centers, to intermediate pressures used in local neighborhood distribution systems and, finally, low pressure service lines used by individual customers. High-pressure systems operate in excess of 60 psig, intermediate-pressure systems operate between 2 psig to less than 60 psig, and low-pressure systems operate below 2 psig (nominally between 7 and 12 inches WC).

Portions of this system were installed beginning in the late 1800s up to the present and segments have been replaced and uprated over the years through various main replacement programs. Please see Figure 2-1 for an illustration of the system infrastructure in the Greater Springfield Area.

Figure 2-1, Greater Springfield Area Infrastructure



2.2.2 Area Served by Agawam Gate Station and Transmission/Distribution Line

The Agawam Gate Station is located west of the Connecticut River and is the single, largest source of supply for approximately 40,000 customers situated east of the Connecticut River in parts of Springfield, Longmeadow, East Longmeadow and Chicopee. The Agawam Gate Station is also responsible for supplying the entirety of the gas system west of the Connecticut River, consisting of approximately 18,000 customers. A total of approximately 58,000 customers are fed off the system on both sides of the Connecticut River.

The Agawam Gate Station provides supply into a transmission-grade pipeline that was originally built in 1951 (the "Transmission Line"). It has a Maximum Allowable Operating Pressure of 260 psig and operates at approximately 235 psig. The Transmission Line consists of 8,500 feet of 16-inch, coated-steel pipe, which was originally installed in 1951 and has been subject to periodic replacement over time. The Transmission Line feeds the Union Street Extension Station, which reduces the system pressure for distribution purposes from approximately 230 psig to 60 psig.

The Transmission Line delivers natural gas to a 60-psig distribution line that crosses the Connecticut River on the Memorial Avenue Bridge (the "Distribution Line"). The Distribution Line, which was installed in 1968, consists of approximately 1,400 feet of 20-inch, 60-psig, cathodically-protected, coated-steel main. It is located in an approximately eight-foot-wide diameter pipe chase (a specially constructed utility conduit) under and

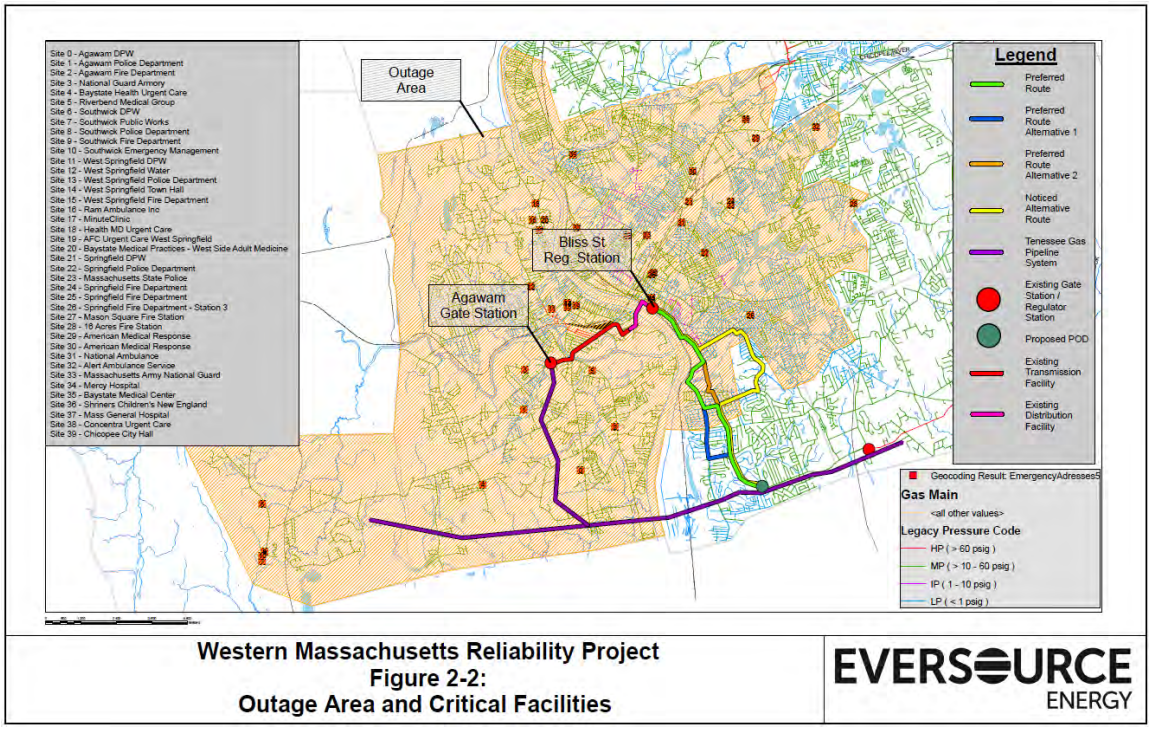
within the Memorial Avenue Bridge that contains other utilities, including electric, cable, lighting and telephone conduits. The Distribution Line represents a primary connection between the Agawam Gate Station, on the west side of the Connecticut River, and the Company's customers in Springfield, Longmeadow, and part of Chicopee on the east side of the river. On design days, approximately 4,500 thousand cubic feet/hour ("MCFH") of natural gas is transported through the Transmission Line and approximately 3,000 MCFH is transported through Distribution Line. Once gas supply from the Agawam Gate Station crosses the Connecticut River via the Distribution Line over the Memorial Avenue Bridge, it is distributed to customers through a network of distribution pipelines.[5]

2.2.3 Need for the Project

In the event of a contingency at the Agawam Gate Station or along the Transmission Line, the geographical extent of the outage to the full 58,000 customers is shown in Figure 2-2, below. If the Distribution Line (i.e., through the Memorial Avenue Bridge chase) is unavailable for any reason, the 40,000 customers served by that line would lose gas service and be exposed to a potentially protracted outage until the Distribution Line can be placed back in service.

[5] There is limited ability to backfeed the load in this area from the East Longmeadow POD station and neighboring gas suppliers (such as Westfield Gas & Electric and Holyoke Gas & Electric). Under very controlled and carefully planned operations, the Company uses this approach to supply customers during scheduled maintenance activities performed during summer (i.e., very low demand) months at the Agawam Gate Station and along the Transmission and Distribution Lines serving customers in Springfield, and only then when the outside temperature is above 60°F. Moreover, planning this type of operation often takes several days to reconfigure flow in the system. However, there is no way to serve the entire Greater Springfield Area during the winder period of higher demands given the limited capacity in the distribution system that is available to serve customer loads. It should be noted that such load level is exceeded for 85% of the year, which by itself makes the existing situation unacceptable as a long-term measure to address contingencies during the periods when reliable gas service is most needed.

Figure 2-2: Area Affected by Contingency at Agawam Gate Station or Along Transmission Line (Including Emergency Facilities)



As shown above, of the 40,000 customers located on the east side of the Connecticut River, there are a significant number of sensitive customers, such as public safety facilities, hospitals, long-term care facilities, government offices, transportation centers and universities. Potentially affected customers include Baystate Medical Center, Mercy Medical Center, Springfield City Hall, Union Street Station, American International College, Springfield College, Springfield Technical Community College and Western New England College. Critically, there are dozens of public safety facilities, such as police and fire stations, within this area of outage including: the West Springfield Police Department, the Agawam Police Department, two Springfield Police Stations, the Springfield Fire Department, the West Springfield Fire Department, the Chicopee Fire Department, eight fire stations and multiple ambulance and medical response facilities. There are also approximately 1,900 commercial properties (including supermarkets, hotels, medical offices and retail stores) and 245 industrial properties (such as manufacturing plants, warehouses, office buildings and electric generation plants) within the potentially affected area. Some of the larger commercial and industrial properties on the east side of the Connecticut River are MGM Springfield, The Basketball Hall of Fame, Tower Square, and the MassMutual Center, among many others.

The Project will provide a new, independent source of gas to the Company's distribution system in the Greater Springfield Area served via the Agawam Gate Station. Specifically, Figure 2-2 shows the area that is currently served via the Agawam Gate Station and that is dependent upon the existing pipeline located within and under the Memorial Avenue Bridge over the Connecticut River. If the Project is constructed, it would become the primary source of supply to the 40,000 customers on the east side of the Connecticut River and become a secondary supply to the 18,000 customers on the west side of the

Connecticut River. Overall, given the number and mix of customers involved, and their vulnerability to a prolonged and serious interruption of service if a contingency were to occur on the Transmission Line, there is a significant and immediate need to reinforce the system to ensure reliable gas service to the area.

2.2.4 Elimination of Single-Feed to Greater Springfield Area

As described above, the design of the system in this area over time has resulted in a large area of customers fed by a single supply feed. With only a single source of supply, these areas are particularly vulnerable to loss of service during a contingency event. The gas distribution industry takes measures to avoid single-feed supply areas, especially when serving a large area with a high volume of customer load, by providing secondary sources of supply to ensure overall reliability. As further set forth in Section 2.4, natural gas distribution companies are expected to take forecast and planning steps to mitigate outage risks and time- and cost-intensive restoration risks associated with single-source feeds. Indeed, as part of its planning process, the Company included this Project as part of its most recently approved forecast and supply plan ("FS&P"), as further described below in Section 2.5. Given the existing supply of natural gas to the area by TGP, and the Company's limited locations for receiving delivery of interstate supplies, the Company has had no option to bring a second source of supply into the Greater Springfield area until recently.

On June 29, 2017, however, the Company entered into a precedent agreement with TGP, which, as amended on September 5, 2017, would, among other things, provide an independent source of supply for the Greater Springfield Area (the "TGP contract"). On November 2, 2017, the Company petitioned the Department of Public Utilities (the "Department") to approve the TGP contract, along with other associated firm transportation and supply contracts, to ensure increased delivery pressure and supply critical to the reliability of the Company's portfolio in the Springfield and Lawrence Divisions. These contracts, which were approved by the Department in 2018 (Bay State Gas Company d/b/a Columbia Gas of Massachusetts, D.P.U. 17-172 (May 31, 2018)), eliminated a supply reliability risk, as described further in the docket, to the Company's existing customers in the Springfield and Lawrence Divisions by providing a firm pathway to adequate and firm supplies. Until these contracts were approved, the Company managed supply deficiencies by relying on city-gate delivered supplies, which are not delivered on a primary firm basis.[6] The TGP contract was procured to ensure that the pipeline capacity required to serve customers, including customers in the Greater Springfield Area, is the most reliable service available on the pipeline, ensuring service to customers. See D.P.U. 17-172, at 29.

In D.P.U. 17-172, the Department approved these firm transportation and supply contracts with TGP pursuant to G.L. c. 164, § 94A. With respect to the construction projects

[6] City gate supplies are not guaranteed to the Company since they are provided on only an as-available basis. Reliance on city gate supplies involves inherent risk due to the growth of demand on TGP's system and the high utilization of pipeline capacity across New England. Importantly, the TGP interstate pipeline that delivers into the Company's gas distribution system, originating from the south and west into New England, is fully subscribed. Without a firm supply in place, customers served in this area are at the highest risk at the point in time when their need for reliable gas service during to the coldest portions of the winter is most acute.

proposed as part of the TGP contact, including those relating to this Project, the Department found that they "will benefit all [Company] customers by enhancing system reliability, improving operational flexibility, and increasing minimum delivery pressures." D.P.U. 17-172, at 42. This Project is designed to implement the Department-approved TGP contract and achieve the critical objectives on which the Department based its approval of that agreement.

As part of the TGP contract approved by the Department, TGP agreed to construct a new city gate station to provide a new POD into Springfield. TGP will be constructing the POD pursuant to its blanket construction certificate of public convenience and necessity from the Federal Energy Regulatory Commission. Tennessee Gas Pipeline Co., 20 FERC ¶ 62,409 (1982). TGP expects to begin construction following the Siting Board's approval of the Company's Project in this proceeding. Construction associated with TGP's facilities at the POD is expected to take approximately three months from the time construction begins.

2.3 The Project Will Provide a Second Source of Supply to the Greater Springfield Area

Currently, customers on the western side of the Connecticut River and a segment of customers on the eastern side of the Connecticut River receive natural gas service from a single source of supply. During peak periods, the customers on the western side of the Connecticut River and a segment of the gas system on the east side of the Connecticut River are entirely dependent on the flow from the Agawam Gate Station and across the Memorial Avenue Bridge, respectively. Any failure of the pipeline between that gate station and over the bridge during peak demand would result in loss of service to approximately 40,000 customers east of the Connecticut River and 18,000 customers west of the Connecticut River. This supply risk, particularly during periods of high demand over the winter season, needs to be expeditiously addressed. The Project offers newer pipelines and a new, independent supply source, mitigating the vulnerabilities and potential supply loss associated with a single, aged source of supply.

2.3.1 Memorial Avenue Bridge Considerations

The Distribution Line over the Memorial Avenue Bridge pipeline is more than 50 years old and was collocated with other utilities within an approximate eight-foot-wide chase in 1968, at the time the bridge was constructed. This proximity creates heightened risks of the pipeline being damaged when other utilities are performing operations or maintenance activities within the chase. In addition, such collocation can exacerbate atmospheric corrosion issues resulting from coating damage or the loss of pipe wall thickness due to galvanic corrosion should the pipe become shorted to a foreign metallic pipeline or other object.

Because of the overall close proximity to other utilities and the bridge structure itself, including inaccessibility of the pipeline within the chase, if repairs are needed to the pipeline, it would be time consuming and costly and could require service outages depending upon the time of year. This concern is heightened if those repairs are needed during the coldest periods of the year when reliance on natural gas is the greatest. As discussed above, the capability to backfeed from other sources is very limited and would be unavailable during periods of peak demand. The repair of leaks on bridges in general,

and the Memorial Avenue Bridge in particular, are complicated and time-consuming because access to facilities is constrained. Most of the Company's pipes that are located within or along the bridge are suspended alongside the bridge structure. This requires repairs to be done via a specialized truck with an articulating platform attached to a boom to allow personnel access to the pipe to perform repairs. These lifts allow the repair crews to be suspended alongside or below the bridge on an aerial work platform. However, such activity on the Memorial Bridge is complicated by the fact that the pipeline is located within a chase with other utilities. Depending on the nature of the equipment required to perform the repair work, space will necessarily be limited to what can be reached via the platform truck and the amount of pipeline available to be accessed via the chase. This is in contrast to a traditional underground excavation where access can be increased simply by excavating a larger area in the vicinity of the pipeline.

Additionally, as a further complicating issue, the Transmission Line from the Agawam Gate Station and the Distribution Line crossing the Memorial Avenue Bridge cannot operationally be shut down to perform routine operations and maintenance activities except during short, off-season periods of low demand. Because the Transmission Line and Distribution Line are the single source of supply for 18,000 customers on the western side of the Connecticut River and up to 40,000 customers on the eastern side of the river, the Company can remove the line from service only during times of very low demand, generally during the summer months, and then only with: (1) emergency interconnections with adjacent utilities such as Holyoke Gas and Electric and Westfield Gas and Electric; and (2) supply backfed across from the East Longmeadow Gate Station located on the eastern side of the Connecticut River. There is not sufficient capacity in the existing system, nor supply available from adjacent gas companies, to provide such backup supply when heating demand is present on the system. Given the restrictions on removing this line from service, the Company would have no realistic option for simply replacing the line in the event of a failure. By providing a second source of supply, the Project will provide greater operational flexibility and allow the line to be taken out of service for repairs while avoiding potential service disruptions.

2.4 Regulatory Considerations

The Project is designed to avoid the disruption of a single source of supply and thus further the public safety and reliability objectives of applicable pipeline regulations and programs. Construction, operations and maintenance regulations implemented by the Natural Gas Pipeline Act of 1968, along with various amendments, ensure public safety and reliability through regulations. Since then, enhancements such as the Distribution Integrity Management Program, Transmission Integrity Pipeline Management Program, and the recommendation by the National Transportation Safety Board to implement a Pipeline Safety Management Standard (API RP 1173) have been introduced to additionally improve pipeline safety and reliability. Such programs and recommendations have sought to operationalize systematic ways to identify hazards and control risks while helping ensure that the risk controls are effective. Most recently, through a study commissioned by the Department, third-party consultant Dynamic Risk highlighted the risks associated with single-supply sources and possible disruptions. Specifically, Dynamic Risk stated, starting in Section 8.4.2 of their report, that:

> The pipeline safety concerns that arise when a Gas Company has an unreliable supply of natural gas may not have been fully considered. **If natural gas supply is disrupted for any reason - including a**

> **disruption of supply from a single source of gas or disruption in the availability of LNG -- the Gas Company would need to take emergency actions and make operational changes to manage their systems to address the lack of sufficient supply.**
>
> Disruption of a single pipeline source has risks if that source becomes unavailable. Depending on the circumstances, the rupture of a natural gas transmission pipeline could take the pipeline out of service for a few days, weeks, or longer. After the pipeline returns to service, its capacity to provide service at the same level before the event also may be limited for some period of time. During this time, despite the contractual obligation (e.g., a firm commitment) to do so, the gas transmission pipelines may not have ability to deliver gas….

See Statewide Assessment of Gas Pipeline Safety: Commonwealth of Massachusetts, Commissioned by the Massachusetts Department of Public Utilities Document, Final Statewide Assessment of Gas Pipeline Safety, at 53-54 (January 29, 2020) (emphasis added).

2.4.1 Restoration Time and Cost Considerations

The Project will also provide resiliency to minimize the impact and duration of outage events, particularly during design-day conditions. Indeed, the Project offers reliability and supply that could avoid many weeks of outages and many millions of dollars of emergency infrastructure costs that might otherwise arise from a severe outage event impacting the current Transmission Line or Distribution Line, along with the consequent significant adverse effects to the public's health and safety. If a contingency event were to occur during peak season conditions along the Transmission Line or Distribution Line that prevented gas flow east over the Connecticut River, gas service to all 58,000 customers served by this infrastructure would be lost. For the period of such interruption, which could last for several weeks, customers served in this area would be without gas service for heating and cooking purposes. This situation raises not only important energy supply reliability concerns, but also potentially significant public health and safety issues to customers who rely on natural gas for all aspects of their daily lives. Depending upon the extent of the disruption, restoration efforts would be time consuming and costly. In addition to the bridge-specific challenges noted above, repairs also require crews to turn off gas at each individual customer location, before gas service can be restored to each customer. Given the large number of potentially affected customers, this process would necessarily involve significant time and expense.

This is not a hypothetical concern. Another New England natural gas distribution company, National Grid, recently experienced a winter outage involving a single supply source that affected far fewer than 58,000 customers, but still resulted in costly and time-consuming repairs. During February 2019, sectors of National Grid's territory that are fed by a single source and located toward the end of an interstate pipeline experienced pressure deficiencies and significant customer outages. Specifically, there were areas of National Grid's Rhode Island service territory in Newport that experienced low pressures and loss of supply. As a result, National Grid needed to shut down a portion of its distribution system, causing an outage to approximately 7,455 customers for approximately one week. Costs associated with outage and restoration effort were over $25 million. The subsequent investigation by the Rhode Island Public Utilities Commission

("RIPUC") determined that the lower pressure was caused by: (1) high demand driven by sudden low temperatures; (2) a system failure at a nearby LNG plant owned by National Grid; and (3) a valve malfunction at an interstate gas transmission company's facility in Weymouth, MA. RIPUC, Summary Investigation Into the Aquidneck Island Gas Service Interruption of January 21, 2019, at 4-5 (Oct. 30, 2019). The RIPUC determined that, although there were extreme weather conditions and failures by an interstate gas transmission company, National Grid "had a duty to forecast accurately, to plan appropriately, and to deploy assets to address foreseeable contingencies." Id. at 6. Specifically, the RIPUC found, National Grid had experienced a similar low-pressure issue in the same area in 2014 that should have caused it to engage in further contingency planning. Id.

In the case of the Greater Springfield Area, as explained in greater detail below, depending on the availability of mutual aid crews from outside the region, the Company estimates that it could take up to or exceed six weeks or more to restore service to 58,000 customers east and west of the Connecticut River in the event of an outage. An outage such as this would negatively affect residential customers in the area, especially those who depend on natural gas to heat their homes. Lack of heat can have significant secondary impacts, including displacement of residents to shelters and hotels, frozen and burst water pipes, and damage to equipment and appliances. Such a widespread outage would also have severe effects to businesses located within commercial districts, including critical needs customers such as public safety services, hospitals, schools, and government agencies that rely on natural gas service to provide essential services to the community.

There is no historical precedent for calculating the duration or ultimate cost of such a widespread outage on the Company's distribution system. Accordingly, the Company has developed two methods for estimating the time and cost associated with loss of service in the Springfield area as the result of a failure at the Agawam Gate Station or the pipeline between that station and the Bliss Street regulator. The first method extrapolates potential costs from similar, smaller outages that have occurred in the region, the restoration efforts necessary to resolve the loss of service and the costs associated with that undertaking. The second method evaluates the resources available to the Company (including third-party resources), as well as pay rates, ramp-up times, work hours and support needs. The Company believes such a "bottom-up" analysis provides a more accurate result. Each of these methods is discussed below.

By scaling similar restoration efforts, the Company estimates that the most basic level of restoration effort (i.e., going door-to-door to turn off, and then turn back on, gas services with no construction efforts required) is estimated to cost approximately $3.6 million per week. This is based on a combination of the costs and timing associated with the National Grid Newport outage discussed above, as well as much smaller gas distribution disruptions elsewhere on the Eversource system in New England. If all 58,000 customers were interrupted, the Company estimates it would take approximately eight weeks to restore services for a total cost of at least $130 million. This type of outage, requiring no system re-construction efforts, could occur if, for example, there were a supply interruption from TGP to the Agawam Gate Station.

Further, the time and cost of restoration would increase significantly if there were a physical contingency that required construction activity (i.e., to replace a damaged pipeline within a road or in other difficult to access locations,). The time and cost associated with such repairs would vary greatly depending upon the nature of the work required and would

be incremental to the restoration time and costs described above. For example, to repair a struck main in a major roadway, the Company estimates that it would be necessary to add a minimum of one to two weeks in order to secure and transport fittings, materials and specialized equipment. The Company estimates that, at a very high level, such repairs for a struck main would cost an additional approximately $1.5 million.

Even though these cost estimates based upon past outages in the New England area may inform the potential cost and duration of an outage, the Company believes these results are likely to understate the actual costs. This is because the Company would be required to significantly scale up its recovery operations in order to respond to a larger, 58,000-customer outage, leading to higher administration and supervision costs, extra outside services costs, an increased number of temporary offices and staging locations and a greater supply of food and lodging for crews. To assist in estimating such costs associated with a larger outage, the Company consulted its Emergency Preparedness Group ("EPG") for information regarding standard costs and times associated with general emergency response measures. The EPG is a division of Eversource that is responsible for emergency response planning, drills, regulatory reporting and incidence response. As a result, the EPG maintains data and tools for tracking and developing cost estimates associated with many kinds of incidents across the Eversource system.

Using the EPG information, the time associated with deactivating the system (going door-to-door to turn of services and make the system safe) for the full 58,000 customers is anticipated to take eight to ten days. The time to repair the system depends upon the nature of the outage but, like above, the best-case scenario would be a simple supply interruption from TGP that would require no physical repairs. Once gas supply has returned, it is then estimated to take 30-60 days to restore the system. The difference between the time to de-activate and re-activate the system is attributable to the difference between deactivating a customer and reactivating a customer. For deactivation, the Company technicians need to conduct only a safety check and close the meter valve. When a customer is being reactivated the technician must conduct a safety check, inspect and inventory customer equipment, purge all gas lines into services and conduct an equipment function test. For purposes of calculating the costs associated with such a loss of service, the Company estimates an average of nine days for deactivation and 45 days for reactivation, for a total of 54 days of work. The costs below are calculated based upon this average.

A staffing ramp-up for an outage response for 58,000 customers would require mutual aid crews to be deployed from other gas distribution companies across the country. Internally sourced resources from Eversource area work centers would become available rapidly (i.e., within the same day). However, a full contingent of mutual aid resources is anticipated to take three days. The number of workers responding to the event over the course of the average event is set forth below in Table 2-1.

Table 2-1: Workforce (Company and Mutual Aid) Response to Outage Over Time		
Day (of Event)	**Level of Response**	**Workers Responding**
1	Initial	150
2	Intermediate	800
3	Full	1,600
4 to 54	Full	1,600

In addition, some outside contractors separate from internal resources and mutual aid crews would be required. These would include police, locksmiths, translators and "Health and Safety" resources to distribute necessary equipment and essentials (such as food, water, blankets, space heaters and time sensitive information and updates). Based upon the above preliminary assessment, the costs to secure sufficient internal and mutual aid crews (for a total of 1,600 workers) to respond over a period of 54 days to de-activate and re-activate services to 58,000 customers is estimated at approximately $344 million.

It should be noted that the above discussion and estimate of costs associated with an outage do not include any cost and timing considerations associated with infrastructure repair. Indeed, if there is damage to or a malfunction of transmission or distribution infrastructure (i.e., equipment failure, damage caused by a third-party), the time and cost associated with such construction efforts would be based upon the potential level of repairs that may be necessary. Cost could vary widely as a result of the cause of the infrastructure damage, the actual repairs necessary and/or the time of year of the outage.

2.5 Consistency with Forecast and Supply Plan

Pursuant to G.L. c. 164, § 69J, no gas company may commence construction of a facility jurisdictional to the Siting Board unless it is consistent with the most recently approved F&SP filed with the Department. Although the need for the Project is not driven by directly load growth, it is consistent with the Company's plans for the area, as discussed generally in the Company's most recently-approved F&SP, docketed as D.P.U. 19-135, and approved by the Department on October 27, 2020. The F&SP outlines how the Company develops what the customer demands are on its overall system and what the required capacity is to serve these anticipated loads. The F&SP also outlines how and where the Company receives its gas supply and how that gas supply meets customer demand.

Specifically, the Company's 2019 Long Range Forecast and Supply Plan described the new POD being installed by TGP in Longmeadow and the Company's interconnection, which would "enhance system reliability for customers on both sides of the Connecticut River and offer economic growth opportunities through enhances gas supply availability." D.P.U. 19-135; Exh. CMA-1, at 84. The Company also noted that this interconnection would require Siting Board approval. Therefore, because the Project was an integral part of the Company's approved F&SP that will address the need for a second source of supply in this area of the Company's distribution system, the Project is consistent with the most recently Department-approved F&SP.

2.6 Conclusion

Based upon the above, there is a critical reliability need for the Company's customers in the Greater Springfield Area that are currently served via a single source from the Agawam Gate Station and one transmission-grade pipeline into Springfield. With the Project in place, the Company would be able to loop its system in such a manner to ensure reliable supply to approximately 58,000 customers during peak periods and foreseeable contingencies. For these reasons, in accordance with Siting Board standards and precedent, the Project is immediately needed to provide a reliable supply of gas to the Company's customers.

3.0 PROJECT ALTERNATIVES

3.1 Analysis for Reviewing Project Alternatives

The Company identified and evaluated a variety of potential alternatives for meeting the Project need to ensure operational reliability, safety, and gas supply backup for the service area. The Company analyzed these potential alternatives by considering their ability to meet the identified need and weighing reliability, environmental factors, and cost considerations. The alternatives identified and evaluated included: (1) a no-build alternative; (2) the proposed Project; (3) alternative POD locations; (4) CNG or LNG; and (5) non-pipeline alternatives and emerging technologies, including energy efficiency, demand response, electrification, and geothermal technologies.

3.2 Description of Project Alternatives

3.2.1 No-Build Alternative

Under the no-build alternative, no improvements would be made to the Springfield Gas Distribution System and the identified reliability need discussed in Section 2 would not be met. The Company must ensure that it is able to reliably supply its customers in Western Massachusetts to meet firm customer demand under reasonably foreseeable conditions in an economic and reliable manner. Without the Project, 58,000 customers in the Eversource system would be entirely dependent on the flow from the Agawam Gate Station, along the existing gas pipeline and across the Memorial Avenue Bridge. A firm supply to these customers during a foreseeable contingency involving a disruption in this area of the Company's system would jeopardize reliability to customers. Because the no-build alternative would not address the need identified in Section 2, it was not considered further.

3.2.2 Proposed Project

The proposed Project is designed to ensure the continued reliability of natural gas distribution to customers located in the Company's Greater Springfield Area service territory. The feed along this pipeline from Agawam Gate station and over the Memorial Avenue Bridge across the Connecticut River from the Agawam Gate Station is a principal source of natural gas for the distribution system on both the east and west sides of the Connecticut River. Upon the installation of the 16-inch-diameter pipeline from the Longmeadow POD to the Bliss Regulator Station (see Figure 1-1), the Project will provide an independent source of natural gas from a different geographic location and different supply point, thus addressing the reliability issue of relying on one supply source for 58,000 customers. As an added benefit, the Project will provide for greater operating flexibility in the Springfield market when responding to maintenance and repair issues. It will also serve as a header system that will improve the Company's ability to replace leak prone pipes under the Company's infrastructure improvement programs.

3.2.3 Alternative POD Locations

3.2.3.1 POD Locations Evaluated by TGP

TGP evaluated in its MEPA Environmental Impact Report ("EIR") (MEPA Certificate No. 15879 – provided in Attachment E) three sites for a POD location to provide Eversource with the gas supply needed to develop the Project. All three sites were located along TGP's gas pipelines in

Longmeadow and included the proposed Longmeadow POD site (the preferred POD Alternative that was ultimately selected), the Connecticut River ("CT River") site, and the Meadows site (see Figure 3-1). A summary of TGP's analysis of alternative sites is described below.

The CT River alternative POD site is a 0.9-acre parcel owned by TGP and located over 0.5 miles from the nearest residence. On this site, there is currently a cleared strip of land for the existing TGP pipeline and two fenced-in locations containing pipeline valving and bypassing equipment, used to separate and control portions of the TGP transmission system. This site is within rare species habitat and the 100-year floodplain, contains habitat for birds and other wildlife, is located adjacent to the Fanny Stebbins Wildlife Refuge and other protected open space, and would require clearing of 0.9 acres of undeveloped land, including 0.3 acres of prime farmland. To interconnect a POD at this site, the Company would be required to construct a 5.9-mile or 6.5-mile pipeline (depending on route) to the Bliss Street Regulator (see Figure 3-2). This site would also require improvements to a narrow dirt access road located adjacent to wetland to allow for adequate site access and installation of utilities (electric and water) to the site.

The Meadows alternative site is 1.2 acres and located west of the end of Jonquil Lane in the Town of Longmeadow on undeveloped and privately owned property that TGP determined could be acquired in fee or by easement. The site is adjacent to the Silvio Conte National Fish and Wildlife Refuge and conservation and water supply land owned by the Town of Longmeadow, but it is not located within rare species habitat or the 100-year floodplain. The site is located within an area of archaeological resources and historic properties. It is within 0.25 miles of 47 residences. Construction of a POD at this location would require disturbance of 1.1 acres of undeveloped land, including a new access road off a residential street and installation of utility lines (water and sewer) to the site. To interconnect a POD at this site, the Company would be required to construct a 5.3-mile pipeline to the Bliss Street Regulator Station (see Figure 3-2).

The Longmeadow POD Site is a 0.98-acre site owned by TGP and located in the southeastern corner of the Longmeadow Country Club. The Longmeadow POD Site does not contain wetlands, 100-year floodplain or rare species habitat. The wildlife refuges are located more than a mile from the site. The site does not affect cultural resources. The site is adjacent to a residential area; the nearest residence is located 41 feet from the site and 178 residences are located within 0.25 miles of the site. To interconnect the POD at this location requires the construction of approximately 5.3 miles of pipeline to the Bliss Street Regulator Station (as discussed in detail in Section 4, below).

As part of its analysis, TGP assessed these POD alternatives and considered the environmental impacts of floodplains, soils/geology, land use, sensitive species and habitats and cultural resources. TGP also indicated whether the site locations were available for acquisition and proximity of nearby residences. TGP did not specifically analyze costs associated with each of the three sites because it determined that the same transmission equipment would be required at each of the considered locations at an equivalent cost. The TGP POD impact data for each of these three sites is provided in below in Table 3-1.

Table 3-1: Estimated Potential Impacts for POD Site Options			
Siting Variable	**CT River**	**Meadows**	**Proposed Longmeadow POD**
Study Area			
Construction Workspace (acres)	0.9	1.1	1.0
Floodplains			
100-year Floodplains (acres)	0.90	0	0
Soils and Geology			
Prime Farmland (acres)	0.30	0	0
Land Use (acres)			
Undeveloped Land	0.9	1.1	0.6
Developed Land	0.1	0	0.4
Sensitive Species and Habitat			
Critical Habitat (acres)	0.90 (listed as Priority Habitat of Rare Species)	0	0
Recreation Areas (within 0.1 mile; yes/no)	No	No	Yes (Longmeadow Country Club)
Conservation Lands (within 0.1 mile; yes/no)	Yes	Yes	No
Wildlife Refuge (within 0.1 mile; yes/no)	Yes (Fanny Stebbins)	Yes (Silvia O. Conte)	No
Important Bird Area	Yes	No	No
Cultural Resources			
Sensitive Archaeological Resources	Yes	Yes	No
Historic Architectural Properties	No	Yes	Yes
Landowner			
Willing to Sell / Grant Easement (yes/no)	N/A (already owned)	Yes	Yes
Residences			
Number of residences within 0.25 mile	0	47	178
Distance of closest residence to site	0.53 mi	191 feet	41 feet

Based upon this analysis, TGP concluded that, although the Longmeadow POD Site alternative would be in closer proximity to residences, it would have the lowest impacts overall, causing the least amount of land disturbance and having the lowest extent of impacts to environmental, natural and cultural resources.

3.2.3.2 Proximity to Residences

The Company agrees with the conclusions reached by TGP on the criteria evaluated above and, considering those impacts, concurs that the proposed Longmeadow POD site has the least environmental impacts. Table 3-2, below, shows Eversource's relative ranking of the three sites based upon the impacts considered by TGP. The sites were scored as follows: superior (+), inferior (-), and equal to each other (=). As demonstrated, the proposed Longmeadow site is superior on nine criteria, the CT River site is superior on four and the Meadows site is superior on five.

Table 3-2: Relative Impacts for POD Site Options			
Siting Variable	**CT River**	**Meadows**	**Proposed Longmeadow POD**
Study Area			
Construction Workspace (acres)	=	=	=
Floodplains			
100-year Floodplains (acres)	-	+	+
Soils and Geology			
Prime Farmland (acres)	-	+	+
Land Use (acres)			
Undeveloped Land	-	-	+
Developed Land	=	-	+
Sensitive Species and Habitat			
Critical Habitat (acres)	-	+	+
Recreation Areas (within 0.1 mile; yes/no)	+	+	-
Conservation Lands (within 0.1 mile; yes/no)	-	-	+
Wildlife Refuge (within 0.1 mile; yes/no)	-	-	+
Important Bird Area	-	+	+
Cultural Resources			
Sensitive Archaeological Resources	-	-	+
Historic Architectural Properties	+	-	-
Landowner			
Willing to Sell / Grant Easement (yes/no)	=	=	=
Residences			
Number of residences within 0.25 mile	+	=	-
Distance of closest residence to site	+	=	-
Notes: sites are ranked relative to each other as superior (+), inferior (-) and equal (=).			

The Company further analyzed the criteria in which the Longmeadow site was *not* rated as highly as the other two sites in TGP's initial analysis, specifically proximity to recreation areas, residences and historical resources. Even further, the Company evaluated additional categories of potential impacts and community concerns at each of the PODs. In this analysis, the Company reviewed potential impacts associated with a POD in proximity to land uses, as well as the ability to mitigate impacts associated with a POD in this location, including aesthetics, noise, traffic, and air impacts. These additional analyses are discussed further below.

Safety

The criterion that had the greatest level of differentiation between the three sites considered by TGP is proximity to residences. While the Longmeadow POD alternative does have the greatest number of residences in proximity (178 within a quarter mile) and the closest distance to a residence (41 feet), Eversource's programs and processes provide a high level of safety and security, in accordance with industry standards and various pipeline safety initiatives. Eversource implements a comprehensive maintenance and inspection program and an effective leak management program, which exceed the requirements of federal and state pipeline safety regulations. In fact, construction, operations and maintenance work at Eversource must comply with regulations required by the Natural Gas Pipeline Act of 1968, along with various amendments, which ensure public safety and reliability. Eversource also complies with other regulatory initiatives designed to improve pipeline safety such as the Distribution Integrity Management Program and Transmission Integrity Pipeline Management Program.

The Company routinely sites natural gas infrastructure such as PODs, meter stations, regulator stations, etc. in such proximity to residences. It is often necessary to locate such facilities near the location of customer demand in order to efficiently provide natural gas service to the Company's natural gas distribution customers. Gas distribution facilities operating at distribution pressures have a finite and limited range; this requires the sources of supply to be located near to or in the general vicinity of customer demand.[7] As part of the Company's Integrity Management Programs, the areas surrounding its existing PODs are evaluated according to the criteria established by federal code. A summary of this information for the Company's existing 11 PODs is set forth below in Table 3-3. For purposes of comparison, the data associated with the proposed Longmeadow POD is provided as the final row.

The data in the table shows that the number of habitable structures in the vicinity of the Longmeadow POD is less than the number of habitable structures around many other PODs that are safely being operated by Eversource in municipalities across Massachusetts.

[7] In contrast, interstate transmission facilities operate at high pressures and diameters and have compression facilities allowing the transmission of natural gas along great distances. Distribution facilities have limited diameter and pressure and do not operate with compression facilities. Therefore, distribution facilities have a much smaller capacity per unit distance and diameter. This necessitates the siting of sources of supply in proximity to customer demand.

Table 3-3: Number of Habitable Structures within 500 yards of a POD or Similar Structure	
Eversource Facility	**Number of Structures**
Brockton Station	159
New Bedford Station	40
Plymouth Station	130
Norfolk Station	71
Ashland Station	131
Assonet Station	17
Westwood Station	165
Framingham Station	39
Agawam Station	289
Medford Station	243
Northampton Station	167
Grafton Station	72
Freetown Station	72
Sharon Station	97
Hudson Station	171
Mendon Station	30
Milford Station	129
Hopkinton Station	25
Cambridge Station	1,037
Needham Station	60
Taunton Station	186
Marlboro Station	99
Methuen Station	476
Medway Station	88
Worcester Station	287
Plymouth Station	10
Andover Station	16
Monson Station	18
Hopedale Station	165
Westwood Station	221
Dover Station	70
Attleboro Station	126
Canton Station	183
Proposed Longmeadow POD	**117**
Notes: Data based on number of sites located within 500 yards of the station (this buffer distance establishes a general study area for defining the approximate density of habitable structures).	

As shown on this table, proximity to buildings, places of assembly and other human occupancy is similar for the proposed Longmeadow POD as for other PODs on the Company's system. Given the Company's safety programs and processes and the successful operating history of other, similar located PODs, as well as the natural environmental impacts (land, environmental and cultural resource impacts) that are minimized by the use of this location, the Company believes the proposed POD can be constructed at this location in an efficient and low-impact manner.

Human Use Impacts (Aesthetics, Noise, Traffic, Air)

With respect to proximity of the POD to residences, the facility is designed to minimize human use impacts. For instance, Eversource has minimized visual impacts by ensuring the equipment is enclosed in low profile buildings that are consistent with the aesthetics of the existing country club buildings with respect to style, scale and location of the buildings. In addition, landscaping was added along the POD site footprint (see landscaping plan in Attachment H. Plantings include 70 large 7- to 8-foot trees to block views (eastern cedar and arborvitae) and understory plantings (mountain laurel, switchgrass, rosebay rhododendron and leatherleaf viburnum). In addition to these trees, the facility already has a substantial natural wooded buffer of mature trees which will shield views of the proposed POD from the north and from the golf course as documented via visual simulations in Attachment H. Finally, Eversource is proposing a screening fence to help block views from the street toward the Project.

With respect to noise, the facility complies with all applicable noise regulations and the Company is including all appropriate mitigation to ensure that noise impacts to residences in the area are minimized. Specifically, the noise modeling results show that with the incorporation of reasonable noise control measures, increases in sound due to Project operation are expected to meet the FERC's 55 A-weighted decibels ("dBA") noise criteria over a 24-hour period (18 C.F.R. § 157.206 (2022)), and the Massachusetts DEP noise criteria, which allows a maximum of 10 dB(A) increase above L_{90} at property lines (310 C.M.R. 7.10). This information is presented in Section 5.9.2.6. Based on the Company's noise analysis, the area should experience minimal noise increases.

With respect to traffic, there will be a small increase in traffic during construction as a result of truck deliveries required, and construction workers needed on site. To minimize traffic impacts, workers will be directed to not park on local roadways and a traffic control officer will be available as needed to ensure cars and trucks safely enter and leave the work site. Once the facility is constructed, it will be monitored remotely and, therefore, only a very limited number of maintenance staff will work at the facility on an interim basis. Thus, no traffic increase is expected during ongoing operations.

With respect to air impacts, because of the low quantity of emissions, the POD does not require any air plan approvals from MassDEP. Thus, there will be no adverse air impacts to the community (see Section 5.9.2.5).

In summary, although the facility is situated in proximity to residences, Eversource will take substantial mitigation measures to minimize or eliminate potential visual, noise, traffic or air impacts or other human use impacts that could result from the POD.

3.2.3.3 Eversource Analysis of POD Site Alternatives

Eversource evaluated and confirmed the TGP analysis set forth above on each of the topics identified by TGP. The Company then took the TGP analysis a step further and also compared the three sites on the basis of: (1) wetlands; (2) perennial streams; (3) subsurface contamination;

(4) wellhead protection zones; (5) Natural Heritage and Endangered Species Program Estimated Habitat of Rare Species ("NHESP"); and (6) area of tree clearing required. Figures 3-3, 3-4 and 3-5 show these relevant criteria mapped along with other information previously considered (e.g., closest residences and NHESP priority habitat).

Wetlands

Construction of facilities such as the POD within wetlands has the potential to destroy vegetation and associated wildlife habitat, alter wetland soils and hydrology, and introduce invasive plant species into the wetlands. Facilities constructed within the 100-foot buffer zone to wetlands can also affect these resources via damage to protective vegetation that act as a buffer around the wetlands. If siltation control is not addressed carefully while preforming work in the buffer zone, such resources can be affected via sediments draining into wetlands from nearby construction work.

With respect to wetlands, the CT River POD site's eastern edge has a wetland slightly extending on to the site (0.01 acres). However, access to the site requires crossing this wetland and thus involve impacts to aquatic resources associated with wetlands. In addition, the narrow dirt road leading north from the facility (West Road) would need improvements to serve as the access road to the facility. This road would likely have to be widened to accommodate truck deliveries, as the access road improvements border 2,250 linear feet of wetlands on both side of the road. This work would have wetland impacts and require filing under the Wetlands Protection Act ("WPA") and possibly a DEP Water Quality Certification and U.S. Army Corps of Engineers approval under the Clean Water Act, depending on extent of wetland impacts.

The Meadows Site does not contain wetlands, but it is situated within approximately 75 feet of a wetland to the west. This wetland is located at the base of a steep hill sloping down from the site and thus any impacts from ground disturbance to the Meadows site if not mitigated properly could affect this wetland or result in erosion along the area sloping down to the wetland (see Figure 3-4). Work at the Meadows site may also require filing under a Wetland Protection Act for work in buffer zone (e.g., within 100 feet to a resource area protected under the WPA).

The Longmeadow site, unlike the other two sites, is in a developed area and far from wetlands (e.g., over 2,000 feet away). As a result, work at the Longmeadow site would not affect wetlands and the Longmeadow site is the best option for avoiding impacts to this resource.

Perennial Streams

Construction of facilities in perennial streams has the potential to create turbidity and affect the aquatic life within the stream. Facilities constructed close to perennial streams within the 200-foot Riverfront Area protected under the WPA can also affect streams if siltation control is not addressed carefully. In these instances, sediments disturbed during construction can drain into streams affecting the water quality and fisheries. The CT River POD Site does not include a perennial stream. However, the dirt road leading north from the facility (West Road), which would be used for access to the site, crosses Longmeadow Brook, a perennial stream. As this small dirt road would likely have to be widened to accommodate the gas line, an electric line and safe road width for transportation to and from the site, this road may require crossing improvements such as a wider or larger culvert. This work would require a conservation commission approval and could require DEP Water Quality Certification and/or U.S. Army Corps approval under the Clean Water Act, depending on extent of impact.

The Meadows POD does not include a perennial stream, but is situated upgradient of Longmeadow Brook, located approximately 200 feet to the north of the Meadows site. Work in this area may require conservation commission approval (if within 200 feet of the brook), and would be considered Riverfront Area, requiring special protections under the WPA. Such work will need to ensure proper erosion controls to ensure sediments from the site are not transported into the downgradient brook during construction.

The Longmeadow POD does not include a perennial stream and is more than 2,500 feet to the south of Longmeadow Brook, and thus would be best for ensuring no impacts to this resource. Therefore, the Longmeadow POD site avoids all impacts to perennial streams and is superior with regard to this criterion.

Subsurface Contamination

Performing construction in proximity to subsurface contamination may spread contamination if work is not performed properly. This can include contaminated sediments being transported offsite by surface runoff during storm events, contaminated dust being blown off site and or improper disposal of contaminated soils or groundwater. None of the Alternative POD sites is located near Activity Use Limitation ("AUL") areas. AULs are designated by DEP and require limitation on type of use depending on extent of contamination on site. The CT River, Meadows and Longmeadow POD are situated 0.75 miles, 1.39 miles and 1.53 miles away from the closest AUL, respectively.

None of the Alternative POD sites is located near a Chapter 21E site. A Chapter 21E site is a site documented during a Chapter 21E Site assessment and on which exists contamination. The CT River, Meadows and Longmeadow POD are situated 2.2 miles, 1.8 miles and 1.9 miles from the closest Chapter 21E site, respectively.

As none of these sites is near AULs or Chapter 21E sites, the potential for contamination is not likely and contamination is not an issue which differentiates the POD sites.

Wellhead Protection Zones

None of the alterative POD sites is situated in a wellhead protection zone. Wellhead protection zones are designated by the MassDEP in order to protect drinking water supplies by limiting development and certain land uses in proximity to well head areas. Construction in a wellhead area can result in contamination of well sites if hazardous materials are spilled and enter the groundwater within the protection zone. The CT River POD, Meadows POD and Longmeadow POD are situated 2.0 miles, 2.0 miles and 1.5 miles from the closest wellhead protection zone, respectively. As none of the sites is near wellhead protection zones, this is not an issue or a factor that differentiates the POD sites.

NHESP Estimated Habitat of Rare Species

Estimated Habitats are a sub-set of the Priority Habitats and are based on the geographical extent of habitat of state-listed rare wetlands wildlife and is codified under the WPA, which does not protect plants. Construction in such a habitat can damage or destroy habitat for rare species and in turn destroy or harm rare species that utilize the habitat. None of the sites is located within NHESP estimated habitat (though the CT River POD Site is in Priority Habitat as noted in the table above). The CT River, Meadows and Longmeadow POD sites are situated more than 1,000

feet, 2,500 feet, and 3,700 feet, respectively, from estimated habitat. As such work in these sites will not affect estimated habitat and this is not an issue or factor that differentiates the POD sites.

Tree Clearing

With regard to tree clearing, the Company reviewed the amount of tree clearing required on each site. The sites are all close to an acre in size and it was assumed that all sites need to be cleared entirely. Eversource also assessed the clearing required for the driveway/access road that would be required for the sites, assuming a 20 foot wide area to include the driveway, electric line, water line and gas line. The resulting tree clearing required for the CT River, Meadows and Longmeadow sites is 1.24 acres, 0.74 acres and 0.47 acres, respectively.

In summary, the Longmeadow POD has the least amount of tree clearing since a large portion of the site is parking lot/open area and unlike the CT River and Meadows sites, a long driveway or access road is not required. The Longmeadow POD site is therefore advantageous with respect to minimizing tree cutting and removal of forest habitat compared to the CT River and Meadows Sites.

Summary of Results

The table below summarizes Eversource's additional analysis of the POD alternative sites.

Table 3-4: Summary of Additional Evaluation of Sites

Siting Variable	CT River POD	Meadows POD	Longmeadow POD
Wetlands	0.01 Acres on site and 2250 linear feet of wetland likely affected for improvements to access road	None	None
Perennial Streams	One Stream (associated with need to improve access road)	None	None
Subsurface Contamination	None	None	None
Wellhead Protection Zones	None	None	None
NHESP Rare Species Habitat	None	None	None
Tree Clearing	1.24 acres	0.74 acres	0.47 acres

Conclusions on Environmental Impacts of PODs

Eversource's evaluation of the PODs shows that use of the Longmeadow POD minimizes environmental impacts and is consistent with TGP's environmental analysis that showed the Longmeadow POD minimizes environmental impacts compared to the other sites.

POD Reliability and Cost Considerations

Eversource considers the reliability of each of the potential POD locations to be equivalent in that they are each located within Longmeadow in proximity to the TGP system and the Eversource Bliss Street Regulator. Thus, Eversource considers the reliability of each of the potential POD locations to be equivalent. Eversource is not aware that TGP considered cost of property acquisition in its analysis of potential alternatives sites. Instead, TGP considered the feasibility of acquiring the necessary property rights.

Eversource anticipates that it will execute an operations agreement with TGP that will include tax payments, landscaping costs and operation/maintenance of facilities. Whether such an agreement would include any TGP acquisition cost for the necessary rights is unknown at this time. However, if such a cost were to be included, the CT River site, which is already owned by TGP would not be expected to include any such land right acquisition cost and, therefore, be slightly preferable from a cost acquisition perspective. Other differences in Eversource's costs are quantified below:

Costs for Access Roads, Utilities and Clearing

With respect to Eversource's cost at each particular POD location, the Longmeadow POD has an advantage over the CT River POD and Meadows POD locations in that it does not require costs associated with constructing or improving a long access road/driveway and associated electrical/water interconnect costs since it is situated close to the roadway. The CT River POD, on the other hand, would require costs for improving a narrow dirt road for over 2,250 feet and installation of electric line and water line (for fire suppression) estimated at a total of $280,600. The Meadows POD requires costs to construct a 200-foot driveway along with an electric and water line at an estimated cost of $240,000. The Longmeadow POD site also minimizes tree clearing costs compared to the other PODs and does not have other environmental factors that could affect costs. Tree clearing costs at the Meadows and CT River sites are very preliminary estimated to be $7,400 and $12,400, respectively.

Cost for Archeological Investigations

There is the potential for archeological resources at the Meadows POD site. The Meadows POD location was partially tested before in 1990s and again in 2001 for archeological resources. Site 19-HD-201 the Longmeadow Brook Bluff site is located in the area and some additional archaeological testing may be needed in the Meadow's parcel to see if the identified archeological site extends into the work area and if it's eligible for listing on the national register. It is estimated that the locational study/Phase 1 would cost between $20,000 to $25,000, and if Phase II testing was needed, that would be about $25,000 to $30,000. The costs of Phase III testing are difficult to determine without knowing what the site contains, but it would roughly be $40,000 to $50,000. This assumes that the testing is limited to the 1.2 ac parcel shown on Figure 3-4.

Regarding the CT River POD alternative site, this is located in an area that was previously tested in 2001 and an archaeological find spot was located but it was determined not archaeologically sensitive and no additional testing would likely be needed for this location. The Longmeadow POD site does not have archeological resources.

Cost for Work in NHESP Priority Habitat

The CT River POD is in NHESP priority habitat. Priority habitat includes areas designated by the State of Massachusetts as important habitat for state endangered species or plants and work within these areas requires consultation and approval by the NHESP. Work in NHESP priority habitat can result in costs associated with performing environmental studies to confirm extent of priority habitat and there can be costly mitigation requirements and or development restrictions that could make the area unusable or require limitations on site use. Although the cost implication of this issue cannot be understood at this time without consultation with NHESP and detailed evaluation of the priority habitat, this clearly presents a risk for use of this alternative site since there could be development restrictions.

Cost for Work in Floodplain

The CT River POD is located 8 to 12 feet below floodplain and would require a substantial amount of fill to bring the elevation up to two feet above floodplain to build the facility safely, plus the provision of an equivalent amount of compensatory floodplain per the requirements of the Wetlands Protection Act. This would require approximately $1,000,000 for the required grading and trucking of fill (assuming the source of the fill is nearby). This would not include the extra and potentially substantial cost of having to procure this added area of land for floodplain compensatory storage. Eversource also evaluated potential for surface bedrock, which can require costs for blasting, and assessed the sites for steep topography, which can require high site grading costs, but all three sites did not have these issues.

Conclusions on Environmental Cost Issues with the POD sites

The Longmeadow POD site does not require a new access road, substantial clearing, archeological investigations, work in priority habitat, or work in floodplain. As a result, the Longmeadow POD site is substantially less costly than the CT River POD or the Meadows POD alternative sites, which require all or at least one of these tasks. Specifically, Table 3-5 below shows that the CT River Site and Meadows Site would cost as much as $1,392,000 and $242,000 more, respectively, than the Longmeadow Site POD Site. Therefore, the Longmeadow POD site is the best site for minimizing costs of the POD work.

Table 3-5: Estimated Additional Environmental Costs for Development of Alternative POD Sites

Cost Criteria	CT River POD	Meadows POD	Longmeadow POD
New Access Roads, Utilities ROW and Clearing	$292,000	$247,000	<$5,000 (clearing)
Archeological Investigations	$25,000 to $105,000	0	0
MA NHESP Investigations and mitigation	Potentially substantial but cannot be costed at this time	0	0
Flood Plain	$1,000,000	0	0
Total	$1,317,000 to 1,397,000 (not including NHESP costs)	$247,000	<$5000

3.2.3.4 Routing Alternatives from POD Sites

In addition to the comparisons of the POD sites, Eversource performed a preliminary routing analysis to understand and compare the impacts with routing from the alternative POD locations. Specifically, the Company selected the most direct route from the potential POD locations and performed a desktop analysis of the following impacts: length, number of residences, number of commercial/industrial parcels, sensitive receptors, Article 97 lands crossed, adjacent recreation lands, historic areas, wetlands, NHESP habitat, tree clearing and cost. The results in Table 3-6, below, show that the proposed route from the Longmeadow POD has fewer environmental impacts than potential routes from the other alternative POD locations for most categories.

Table 3-6: Alternative POD Location Routing Matrix - Raw Data

Criteria	CT River POD (via routing to north)	CT River POD (via Meadows Routing)	Meadows POD	Preferred Route (via Longmeadow POD)
Route Length (Miles) (From POD to Bliss Street Regulator Station)	5.7	6.3	5.2	5.3
Number of Residences within 100' of ROW	181	242	242	263
Number of Commercial/Industrial Parcels within 100' of ROW	7	11	10	3
Number of Sensitive Receptors	1	3	3	0
Article 97 Lands Crossed	2	2	0	0
Open Space Lands/ Article 97 Lands (# of Lands within 100 ft)	4	9	5	4
Historic Areas (MHC Data) (# of Structures)	18	37	37	20
DEP Wetlands Crossed (Linear feet)	2,252	2,341	0	0
NHESP Priority Habitat of Rare Species (Miles)	0.71	0.7	0	0
Tree Clearing (Acres)	5.37	1.69	0.65	0.82
Cost (Millions of Dollars) - Entire Route Length	65.0	71.7	59.4	60.5
Notes: Table includes routing data from PODs to the intersection of Longhill Street and Sumner Avenue, after which the routes join together.				

Cost of Routing Options

The information in the table above shows that based on the mileage of the routes, the CT River POD is the longest and the most expensive of the alternatives at $65.0 million to $71.7 million, depending on the ultimate routing from the CT River POD. The routes from the Meadows POD and the Longmeadow POD are estimated to have a substantially equivalent cost based on their 5.2 to 5.3-mile-long routes.

3.2.3.5 Overall Conclusions on CT River POD, Meadows POD and Longmeadow POD

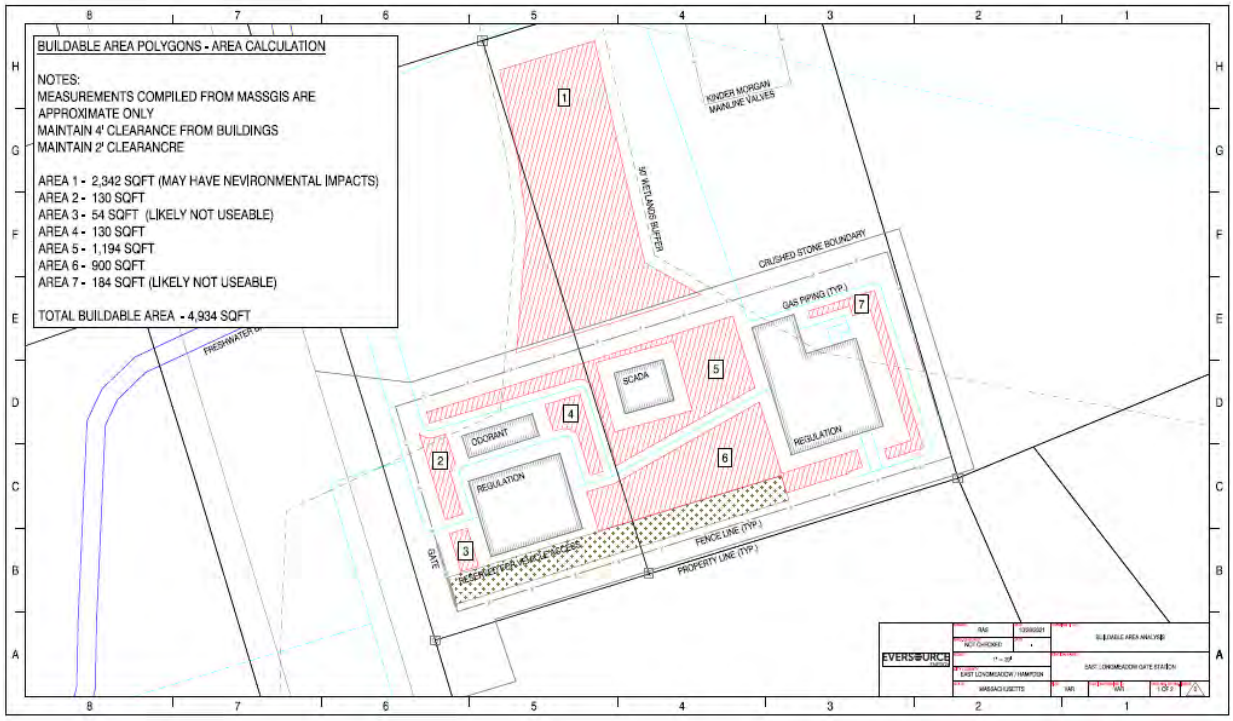
Overall, Eversource considers the reliability of the CT River, Meadows and Longmeadow POD sites to be equivalent. With regard to cost, the CT River and Meadows POD sites would be slightly more expensive for Eversource to construct and operate its facilities, as compared to the Longmeadow POD site. Considering environmental impacts, as summarized in Tables 3-1 through 3-5, the Longmeadow POD site location and its gas line route minimize impact on environmental issues compared to the CT River POD and the Meadows POD. With respect to proximity to residences, the Longmeadow POD and its route are closer to homes than the other PODs and their routes, but Eversource has designed the project to minimize impacts with respect to aesthetics, noise, traffic and air, and residents in proximity to the POD will not be affected by such issues. All sites are equal with respect to safety. Indeed, the Company routinely sites natural gas infrastructure such as PODs, meter stations, and regulator stations in reasonable proximity to residences and Eversource implements a comprehensive maintenance and inspection program and an effective leak management program, which exceed the requirements of federal and state pipeline safety regulations. Accordingly, the Company has independently determined that the Longmeadow POD location is superior when balancing considerations of reliability, cost and environmental impacts.

3.2.3.6 East Longmeadow POD

Another site that the Company considered as a potential alternative to the proposed Longmeadow POD site is Eversource's existing meter station in East Longmeadow. The Company received community feedback asking it to consider expanding an existing facility rather than installing an entirely new POD at a location where there is not existing above-ground gas infrastructure. The existing East Longmeadow POD is located at 484 Shaker Road, East Longmeadow and is also supplied via the TGP pipeline. Customers principally served via this station are in the communities of Chicopee, East Longmeadow, Hampden, Longmeadow, Ludlow, Springfield, Wilbraham, Granby, and South Hadley and total over 38,000.

However, the East Longmeadow POD is located on a geographically-constrained parcel. A diagram of the existing East Longmeadow POD is provided below as Figure 3-6. The site itself is 0.51 acres (22,215 square feet), and equipment currently occupies approximately 0.33 acres (14,375 square feet) and an existing wetland occupies approximately 0.07 acres (2,940 square feet). The Company calculated that the total buildable area remaining at this site is approximately 4,900 square feet. The Company calculated that the minimum area required for the installation of the facilities for the new POD would require at least the very minimum 6,100 square feet. However, even this size area, while technically feasible, assumes an extremely dense facility design configuration and best practices for safe operations of a POD dictate substantially more space be allotted (e.g., approximately one acre) to allow more separation between buildings and larger area in general for construction and maintenance work, deliveries and access by emergency vehicles in the event of a contingency. Thus, there is not enough area for the installation of the required equipment.

Figure 3-6: Buildable Area at East Longmeadow POD



Moreover, installation of the new POD equipment at the East Longmeadow site would require redesigning and reconstructing most of the existing station to accommodate the additional capacity of the existing station. To serve the proposed Project from the East Longmeadow Station would require doubling the existing station capacity. This would require larger piping, additional regulator runs, larger valves, larger heaters and larger odorization equipment. Additionally, TGP would have to increase the inlet piping and meter run sizes to accommodate a doubled station capacity.

Constructing the new POD at the East Longmeadow site also has significant feasibility issues in terms of maintaining the reliable and safe operation of the existing facilities while the new facilities were installed. In undertaking construction and reconfiguration of the existing site, the existing POD equipment would need to be removed in order to utilize parts of the existing footprint. This would likely require the installation of a temporary POD unit that would be costly.

In addition to the spatial constraints at this site and its location, there would be significant environmental considerations. The existing site is encumbered by roads, wetlands, and other pipeline uses that would further restrict expanding the site.

There would also be significant impacts associated with installation of new pipeline from the East Longmeadow POD to the Company's Bliss Street Regulator. The existing East Longmeadow POD is located significantly to the east from where Eversource seeks to interconnect with its existing 12-inch gas line at the Bliss Street Regulator. An interconnection between East Longmeadow and the Bliss Street Regulator would require a gas pipeline of approximately 7.37 or 7.76 miles depending on the route (see Figure 3-6), which is substantially longer and would

have more environmental impacts than the proposed 5.3-mile pipeline route associated with the proposed Project with the POD located on Hazardville Road in Longmeadow.

In terms of reliability, utilizing the existing station in East Longmeadow would be inferior to constructing a new POD station in Longmeadow. This is because a single failure at East Longmeadow would disrupt two critical POD facilities. Having two separate stations, as would be the case with the Longmeadow POD, provides more backup potential because, in the event of an equipment failure or emergency, the geographic separation of the facilities would allow operators increased flexibility.

Finally, even if the new facility could be built at the existing East Longmeadow POD, it would be at a higher cost to account for the site construction and longer interconnect. Specifically, the POD equipment at the East Longmeadow site would cost approximately $10 million, roughly $5 million more expensive than the new POD proposed in Longmeadow. In addition, the longer pipeline of 7.4 to 7.5 miles, depending on route, is anticipated to cost approximately $84.3 million. Together, the cost of this alternative is anticipated to be approximately $94 million for upgrades and pipeline compared to Project cost of approximately $65.1 million for the proposed Project (along the Preferred Route, as discussed in Section 4).

3.2.3.7 Conclusion on Alternative POD Locations

Table 3-7, below, summarizes information above and shows that, overall, the proposed Longmeadow POD minimizes both impacts to the environment and cost compared to the CT River and Meadow POD locations. The table below shows that the Longmeadow POD site is superior relative to the other POD sites in 12 categories with respect to minimizing environmental impacts and cost, whereas the CT River and Meadow sites had superior rankings for only six and seven environmental impacts, respectively. Because the CT River, Meadows and Longmeadow PODs are the same with respect to reliability, the Longmeadow POD is the superior location for this important component of the Project.

As noted above the use of the East Longmeadow POD is not feasible because of the limited amount of space on site. Additionally, use of the East Longmeadow POD would have reliability concerns and require a long interconnect with associated increased environmental impacts and costs.

Table 3-7: Summary of Impacts and Costs for Alternative POD Locations and Routing			
Criteria	**CT River**	**Meadows**	**Proposed Longmeadow POD**
POD Impacts			
Construction Workspace (acres)	=	=	=
100-year Floodplains (acres)	-	+	+
Prime Farmland (acres)	-	+	+
Undeveloped Land	-	-	+
Developed Land	+	+	-
Critical Habitat (acres)	-	=	=
Species – PH2064)	+	+	-
Recreation Areas (within 0.1 mile; yes/no)	+	+	-
Conservation Lands (within 0.1 mile; yes/no)	-	-	+
Wildlife Refuge (within 0.1 mile; yes/no)	-	-	+
Important Bird Area	-	+	+
Sensitive Archaeological Resources	-	-	+
Historic Architectural Properties	+	-	-
Number of Residences within 0.25 miles	+	+	-
Distance of Closest Residence to Site	+	-	-
Other Impacts Evaluated by Eversource			
Wetlands	-	=	=
Perennial Streams	-	-	+
Subsurface Contamination	=	=	=
Wellhead Protection Zones	=	=	=
The MNHESP Estimated Habitat of Rare Species	=	=	=
Tree Clearing	-	-	+
POD Routing Impacts			
Overall Environmental Impacts from Routing Assessment	-	-	+
Cost (+ indicates less expensive)			
• POD Site Cost	-	-	+
• Route Option Costs	-	=	=

Table 3-7: Summary of Impacts and Costs for Alternative POD Locations and Routing			
Criteria	**CT River**	**Meadows**	**Proposed Longmeadow POD**
• Total Cost (POD + Routing)	-	-	+
Notes: sites/routes/costs are ranked relative to each other as superior (+), inferior (-) and equal (=).			

3.2.4 Non-Pipeline Alternatives

In its evaluation of alternatives that could meet the identified reliability need, the Company also assessed various options that would not involve the installation of new pipeline facilities to provide a second source of supply to the Greater Springfield Area. The Company considered installing natural gas storage and transporting natural gas via truck. It also evaluated new and emerging technologies to either reduce the need for natural gas, such as energy efficiency and demand response, or to provide other gas alternatives such as electrification and geothermal technologies, for providing heat and other services traditionally provided by natural gas. In evaluating these alternatives, the Company considered its public service obligation to serve customers reliably under all conditions and avoid an interruption of service.

3.2.4.1 Portable and Stored Compressed Natural Gas

To ensure gas supply at the Bliss Street Gas Regulator Station in the event of a contingency on the transmission or distribution system and create a secondary supply of gas in the Greater Springfield area, the Company considered the use of CNG supply. The CNG alternative would involve taking natural gas from another source, compressing it, and transporting it to the needed location. In this case, CNG would be transported via trucks and delivered to the Bliss Street Regulator to address supply contingency issues. Given the volume of gas necessary at the Bliss Street Regulator to ensure reliable gas supply, one CNG trailer would provide approximately 7.5 minutes of supply, which would therefore require the equivalent of approximately 190 trucks per day to meet the peak demand. This operation would require a very large fleet of CNG trucks and 24-hour personnel onsite during CNG injection into the system.

The Bliss Street Regulator Station is located along a busy roadway in Springfield. Due to the location and heavy traffic in the area, it would be difficult for CNG trucks to be parked and staged at the Bliss Street Regulator Station. Eversource would also be required to modify the existing station to install a connection for CNG injection. In addition, CNG trucking is vulnerable to winter weather, which could result in delays or accidents during winter months when natural gas supply is most critical. Moreover, in stormy weather and snow conditions or during high demand winter conditions, trucks may have trouble maintaining the necessary transportation timing to ensure necessary pressure and may in fact be banned from use of the road by local or state authorities. This alternative would also have significant traffic impacts associated with truck deliveries. For these reasons, a trucked CNG alternative at this location was deemed impractical.

Regardless of feasibility concerns, from a reliability perspective, a CNG option also would not provide the same level of capacity or supply as the Project, because it would not provide a constant supply of gas and would be physically limited by the availability of trucked gas. This alternative would rely on additional, incremental equipment and resources, including a

compression facility (to compress the gas for transport), and a fleet of trucks for transport, and space for a truck unloading facility at the Bliss Street Regulator.

The Company also considered construction of a CNG storage facility near the Bliss Street Regulator Station where the gas is required for reliability. However, such a CNG storage facility would still result in truck traffic and safety issues associated with CNG trucking, and it would be extremely difficult to site and construct given the developed nature of the land use in the area: CNG (and LNG) storage facilities require substantial setbacks from property lines to minimize any potential impacts in the event of a contingency. This is a metropolitan area of Springfield where there is no adjacent land available to site the new facility. For these reasons, the Company eliminated CNG and CNG storage as a potential alternative from further consideration.

3.2.4.2 Portable and Stored Liquefied Natural Gas

Similar to its evaluation of CNG, the Company also considered the use of portable LNG and LNG storage to address reliability issues. Although LNG has many more BTUs per cubic foot than CNG, LNG still faces similar issues as the use of CNG. In this case, vaporizer units in the vicinity of demand points would be required to convert the LNG to natural gas, and trucks would also be required to transport the LNG, which would result in traffic impacts and safety issues. Given the volume of gas needed by the Project for reliability reasons (2,830 MCF/hour), this would require 84 LNG trucks per day. This reliance on trucked LNG reduces the reliability of natural gas delivery. As mentioned above, inclement weather, snow conditions or high demand winter conditions may result in trouble maintaining the necessary truck transportation timing. This alternative would also have significant traffic impacts associated with truck deliveries.

The Company also considered the use of an LNG storage facility near the Bliss Street Regulator Station, but this would still result in truck traffic and safety issues with LNG trucking. The LNG facility would be extremely difficult to site and construct given the developed nature of the land use in the area and large safety setbacks required in the siting of LNG storage. Based upon these considerations, the Company eliminated the use of portable LNG and LNG storage from further evaluation as an alternative for the Project.

3.2.4.3 Emerging Technologies and Other Non-Pipeline Alternatives

Because Eversource is committed to a future where to a much larger degree energy supplies will be delivered using renewable sources, the Company also considered whether non-pipeline alternatives would meet the identified need to ensure supply to gas customers in the Greater Springfield Area.[8] As part of this analysis, the Company evaluated energy efficiency, demand

[8] Eversource views the responsible and efficient use of natural gas as consistent with climate change policies and net zero carbon objectives. As discussed more below, Eversource is an active participant in the future of gas investigation that the Department opened on October 29, 2020. As set out in its notice of inquiry ("NOI") in D.P.U. 20-80, the Department is examining the role of gas local distribution companies ("LDCs") in a net-zero greenhouse gas ("GHG") emissions energy future and the impact of decarbonization strategies on gas distribution operations, customers, employees, reliability, safety and cost. The LDCs have jointly hired a consultant, are engaging with stakeholders and stakeholders and submitted their report on March 18, 2022. Two virtual public comment hearings were held in May and extensive public comments on the LDC report have been filed by a wide variety of entities. At this time, the proceeding is ongoing and a technical session to explore regulatory framework proposals is expected to be scheduled. For the current status of stakeholder engagement in this proceeding, see: https://thefutureofgas.com.

response, electrification and geothermal technologies.[9] While each of these is discussed below, they are all conceptual alternatives at this time in terms of their ability to serve as a feasible substitute for the new gas infrastructure provided by the Project. The Company determined that, while these renewable resources may be promising in the future, more time, development and investment are needed to enable such emerging technologies to reach the scale, feasibility and cost necessary to reliably and affordably meet customers' energy needs in this case.

Energy Efficiency

The Company evaluated energy efficiency[10] as a potential alternative to the Project and concluded that energy efficiency measures cannot meet the reliability need presented in this case. As a preliminary matter, the beneficial load reductions from energy efficiency are fully included in the Company's determination of its load requirements, effectively reducing its load requirements for planning purposes. In its resource-planning process, the Company identifies and evaluates energy efficiency options on an equal basis with available supply-side options and, as discussed, incorporates those effects into its F&SP.[11]

However, even if gas energy efficiency investments continue and could theoretically be expanded, the potential incremental savings resulting from energy efficiency cannot match the scale, timing, reliability or cost efficiencies of this Project.

In 2020, Eversource Gas of Massachusetts ("EGMA") achieved actual annual savings of 3,698,087 therms for its entire service territory of 325,000 plus customers at a cost of $54,385,705. In 2019, EGMA achieved actual annual savings of 4,168,349 therms for its entire

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9 The Company is also evaluating new and emerging low and no carbon technologies and programs to serve natural gas customers. For example, renewable natural gas "RNG" or "Biogas" is a potential alternative to reducing the impact of traditional sources of natural gas and their respective impact on the environment. The Company is currently engaging with other utilities, associations, developers and consultants to research and develop the necessary knowledge, standards and infrastructure to bring RNG into its distribution system. RNG could serve as a substitute for the natural gas commodity itself but would not be an alternative to a secondary source of supply and the reliability of the proposed Project.

10 Since the enactment of the Green Communities Act in 2008, Massachusetts electric and natural gas distribution companies have significantly increased the achievement of energy efficiency savings. The Green Communities Act requires the Company to develop an energy efficiency plan that "provide[s] for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply." G.L. c. 25, § 21(b)(1). The Green Communities Act also requires statewide collaboration among the utilities and the Energy Efficiency Advisory Council, which consists of 15 different stakeholder groups. EGMA offers comprehensive energy efficiency services aimed at reducing natural gas consumption to all customers: residential, residential low-income, and commercial and industrial. These programs have been designed and implemented in coordination with, and are consistent with the programs offered by, other Massachusetts utilities. Through the end of 2021, these programs are as described in the Company's three-year energy efficiency plan for 2019-2021, which was approved by the Department on January 29, 2019. Bay State Gas Company, D.P.U. 18-110 (2019). A new three-year statewide plan for 2022-2024 was filed for Department review at the end of October 2021 and was approved by the Department on January 31, 2022. Eversource Gas of Massachusetts, d/b/a Eversource Energy, D.P.U. 21-121 (2022).

11 Bay State Gas Company, D.P.U. 19-135, at 6, 23, 35 (2020).

service territory at a cost of $61,328,302.[12] On design days,[13] approximately 43,860 therms of natural gas is transported per hour from the Agawam POD. Moreover, the design day send-out at the East Longmeadow POD is approximately 23,000 therms per hour, for a combined market totaling 66,860 therms per hour. For context, in a 24-hour period, the send out on a design day would be over 1.3 million therms, more than a third of the therms saved annually for the Company's entire service territory in 2019 and 2020. Over three 24-hour periods, the send out under design day conditions would likely exceed 4 million therms, more than the annual savings achieved in 2020 and approximately the total energy saved in 2019.

Based on system modelling, in order to be able to meet the identified need, any program, such as energy efficiency, would have to reliably reduce the demand by approximately 42,010 therms per hour on a design day or approximately 63 percent per hour. Moreover, due to the hydraulic nature of the distribution system, customers on the west side of the Connecticut River would have to reduce their demand the most, by 87 percent or 12,310 therms per hour. Customer demand on the east side of the Connecticut River would have to decrease by approximately 56 percent or 29,700 therms per hour. Even if energy efficiency programs could result in a design day reduction of 42,010 therm per hour, which is not feasible, the cost would be approximately $965 million based on the historical performance of the energy efficiency program.

As a result, energy efficiency measures alone cannot achieve the level of demand reduction necessary to avoid the Project. While energy efficiency is an excellent option to reduce customer demand by using natural gas more efficiently, it is not a practical solution for addressing a system contingency that involves a loss of supply and deliverability to such a large customer base. Switching to alternative fuel sources would be required to reduce natural gas consumption sufficiently to displace the demand from the Agawam supply POD.

In sum, energy efficiency measures can help to reduce demand for natural gas in the Greater Springfield Area but would not replicate the timing, reliability or cost of the new independent source of supply offered by the Project. Any contingency cutting off or reducing the Memorial Avenue Bridge supply line would have significant impacts on customers in this area regardless of reductions to natural gas demand that could be achieved from energy efficiency. For these reasons, this alternative was not considered further.

Demand Response

Currently, demand response programs are at preliminary level of development and are therefore not sufficiently advanced to serve as a comparable alternative to the proposed Project.[14] In

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12 This data is available on https://www.masssavedata.com/Public/PerformanceOverview.

13 EGMA uses a one-in-33-year probability of occurrence for its design-day standards. D.P.U. 19-135, at 6. This standard represents extreme winter weather conditions that have a statistically defined probability of occurring infrequently. Id. For its last Department-approved F&SP, the Company used 53 years of historical data, from 1967 through 2019, to develop its normal year, design year, and design day weather standards. Id. at 5. The design day calculation is restricted to the January effective degree days ("EDD") reflected in the weather database and results in 78 EDDs for the Springfield Division. Id. at 6-7.

14 For example, in its recent rate case, NSTAR Gas Company proposed to test the viability of a gas demand response program at a cost of $3 million over three years as an additional tool for managing customers' energy needs. The Department did not approve this pilot. NSTAR Gas Company d/b/a Eversource Energy, D.P.U. 19-120, at 126 (2020).

general terms, gas demand response programs function like electric demand response programs. Customers reduce consumption in response to a signal they receive from the utility for a set time period in exchange for an incentive.

Generally speaking, for load management to be an effective alternative to the Project, there must be a firm, large quantity natural gas resource that a customer is willing to forego. Such scenarios do not exist in New England and particularly in the Company's service territory. For example, the sum total of all non-capacity exempt ("NCE") customer load[15] in the Company's Lawrence and Springfield Divisions total less than 44,000 Dth per day (approximately 2,200 therms per hour). As discussed above, to avoid the Project, system modelling suggests demand must be reduced by approximately 42,010 therms *per hour* on design days in the Greater Springfield Area.

Starting in November of 2021, the Company is initiating a gas demand response program that will include up to 2,000 residential and small commercial Wi-Fi thermostats and ten medium/large commercial customers for a term of three years. The program will temporarily reduce gas usage from residential and small commercial customers by changing set points on Wi-Fi thermostats that are connected to natural gas fired furnaces or boilers.[16] At this time, the Company anticipates that the program will reduce demand over a certain number of hours, but it is unlikely to reduce the total volume of gas consumed over 24 hours.

As designed and approved, the Company's gas demand response program cannot reduce demand at the scale required to avoid the Project and otherwise cannot match the gas supply reliability of this Project. Any contingency cutting off the supply from the Agawam Gate Station or along the line from that facility would have significant impacts on customers in this area regardless of reductions to natural gas demand that could be achieved from demand response. Similar to the energy efficiency programs, the demand response programs are conservation measures designed to utilize natural gas more efficiently. The scale of demand reduction necessary to eliminate the need for the Project would require that demand be switched to an alternative fuel source. Considering most demand is derived from space heating needs, there is no practical approach to eliminating natural gas demand of this magnitude through a demand response program. Given the recent implementation and conservative scope of the Company's gas demand response program, this alternative was not considered further.

Electrification

The Commonwealth's commitment to clean energy and the long-term interests of its residents is clear in its innovative legislative and policy leadership laying out a net zero carbon future:

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15 NCE customers receive firm upstream capacity and downstream distribution service from the Company, buying gas supply from a third-party supplier. This service is distinguishable from firm sales or default service, in which the Company bundles firm upstream capacity, gas supply, and downstream distribution service. It is also distinguishable from capacity-exempt ("CE") service, in which the Company provides downstream distribution-only service and the CE customers buy both gas supply and upstream capacity service from a third-party supplier.

16 The Department approved this program on October 7, 2020, as part of the settlement related to the purchase and sale of Columbia Gas of Massachusetts. Joint Petition of Eversource Energy, Eversource Gas Company of Massachusetts, NiSource Inc. and Bay State Gas Company d/b/a Columbia Gas of Massachusetts for Approval of Purchase and Sale of Assets Pursuant to General Laws Chapter 164, §§ 94 and 96, D.P.U. 20-59, at 61 (2020).

Massachusetts 2050 Decarbonization Roadmap ("2050 Roadmap"),[17] the interim Clean Energy and Climate Plan ("CECP") for 2030,[18] and "An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy" ("2021 Climate Bill").[19] Eversource is committed to being an industry leader in the achievement of these ambitious emissions reductions. Eversource has already committed to achieve carbon-neutrality in its operations by 2030, investing in clean energy and helping customers and the region reduce GHG emissions to secure a clean energy future.

The Company is also an active participant in the Department's NOI which was opened on October 29, 2020, to investigate into the future of gas. In opening this investigation, the Department stated that it will "explore strategies to enable the Commonwealth to move into its net-zero GHG emissions energy future while simultaneously safeguarding ratepayer interests; ensuring safe, reliable, and cost-effective natural gas service; and potentially recasting the role of LDCs in the Commonwealth."[20] The Department further stated that this transition will require the Department "to consider new policies and structures that would protect ratepayers as the Commonwealth reduces its reliance on natural gas, and it may require LDCs to make significant changes to their planning processes and business models."[21]

The NOI will, among other things, assess the feasibility of electrifying end-use technologies as the least cost means of supplying zero-carbon energy along with the elimination of fossil fuels. Currently, the LDCs worked g with their consultants and stakeholders to develop a report that was filed March18, 2022. Further public comment and review on this report are ongoing.

The Company is committed to exploring electrification of its natural gas demand as part of the NOI and is also committed to supporting the state's GHG reduction goals. As previously discussed, 87 percent of the entire natural gas demand on the west side of the Connecticut River and 56 percent of the gas demand in the immediate Springfield and Longmeadow market must

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17 On December 30, 2020, pursuant to the Global Warming Solutions Act of 2008 ("GWSA"), EEA, in consultation with MassDEP, the Department of Energy Resources ("DOER") and other Commonwealth agencies, developed and issued to the public the 2050 Roadmap. The goal of the Roadmap is "to provide the Commonwealth with a comprehensive understanding of the necessary strategies and transitions in the near- and long-term to achieve Net Zero by 2050 using best-available science and research methodology." 2050 Roadmaps at 7. Net zero emissions are defined as the "balancing of gross emissions with removals of greenhouse gases from the atmosphere." Id. at 87.

18 On December 30, 2020, then Secretary of EEA, Kathleen A. Theoharides, established a 2030 interim emissions limit of 45 percent below the 1990 GHG emissions level to maximize the ability of the Commonwealth to achieve the 2050 GHG emissions limit. On the same day, EEA issued a request for comment on the interim 2030 CECP. Public comment on the interim 2030 CECP were open until March 22, 2021. The interim 2030 CECP builds on the 2050 Roadmap, the 2020 CECP, and the 2015 Update to the 2020 CECP. The interim 2030 CECP details the Administration's plan for continuing to equitably and cost-effectively reduce GHG emissions through 2030. Interim 2030 CECP at 6.

19 On March 26, 2021, Governor Baker signed into law this new climate policy as Chapter 8 of the Acts of 2021. The law, which prioritizes equity and environmental justice, stipulates that the state have net zero emissions by 2050 target with two interim benchmarks: by 2030, emissions must be 50 percent lower than they were in the state in 1990, and by 2040, they need to be 75 percent lower.

20 NOI at 1.

21 Id. at 2.

be eliminated to avoid the Project. Nonetheless, at this time, it is impractical to rely on electrification as an option that could be implemented at the scale necessary to eliminate load of this magnitude[22] or at a cost or on a timeline that would be comparable to the Project.[23]

The Company has a public service obligation to serve customers reliably and avoid an interruption of service. The Project will reduce a service reliability risk to 58,000 customers. Any contingency cutting off the supply line from the Agawam Gate Station or the pipeline leading from it toward Springfield would have significant impacts on customers in this area regardless of reductions to natural gas demand that could be achieved from electrifying. Reliance on electrification is not a comparable alternative to the Project in meeting customer needs in a timely, reliable, thorough, and cost-effective manner.

Geothermal

Networked geothermal installations by gas utilities are not yet sufficiently developed to serve as a comparable alternative to the proposed Project. NSTAR Gas Company is piloting geothermal heating and cooling technology in Massachusetts, as a potential long-term energy option to complement or replace oil and natural gas service for customers.[24] The purpose of the pilot is to study the feasibility of networked, utility-provided geothermal energy for providing heating and cooling to customers.[25] As a low-carbon resource, geothermal networks have the potential to be a critical resource in supporting the Commonwealth's GHG emissions reduction targets. If this pilot is successful, Eversource will look to offer networked geothermal energy service to its customers. NSTAR Gas Company is currently in the initial phases of its geothermal pilot and is focused on site selection.

The Company does not have a Department-approved geothermal program. Even if it did, like the other alternatives considered, such a program could help reduce demand for natural gas in the Greater Springfield Area but, as is the case with electrification, it would not replicate the timing, reliability or cost of the Project. Any contingency cutting off the Agawam Gate Station or pipeline

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22 The 2050 Roadmap expects 100,000 residential homes to be electrified each year across the entire state for the next 25-30 years. See 2050 Road Maps, Buildings Sector Report at 8-9/104. It assumes that electrification occurs at the end of a fossil fuel application's useful life and uses $7,500 in its air source heat pump illustration. Id. at 52-53/104.

23 For the sake of argument, if the Company could convert customers on a timeline that would be appropriate, the costs would exceed those of the Project. For example, assuming electrification of the entire residential demand (38,255 customers), the total costs would conservatively range from $287 million to $383 million, using a per customer estimated conversion cost, respectively, of $7,500 (per the 2050 Roadmaps) and $10,000 (per the 2022-2024 Three Year Energy Efficiency Plan). The Project is estimated to cost approximately $65.1 million to construct and will provide reliability of service to over 58,000 customers, which are a mix of residential, commercial and industrial.

24 The Department approved the pilot as part of the Company's rate case with updated cost estimates for the project of $10,261,606 and the third-party evaluation of $300,000. NSTAR Gas Company d/b/a Eversource Energy, D.P.U. 19-120, at 148, 155-156 (2020).

25 Geothermal technologies provide heating and cooling by taking advantage of the relatively stable temperature of the ground (between 50 and 60 degrees Fahrenheit throughout the year). NSTAR Gas Company proposed a geothermal network that uses a closed loop of underground heat-exchanging pipes to circulate water and/or antifreeze solution underground to absorb the soil's heat (in the winter). The water brings the heat to the earth's surface and transfers it to a heat pump, which warms the air, then in-home ducts circulate the air. D.P.U. 19-120, at 128 n. 64.

serving Springfield would have significant impacts on customers in this area regardless of reductions to natural gas demand that could be achieved from ground source heat pumps. For these reasons, this alternative was not considered further.

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3.3 Conclusion

In summary, the Company identified and evaluated many potential alternatives to meet the identified need to provide an independent source of natural gas supply into the Greater Springfield Area. The Company's evaluation considered if each alternative was feasible, could meet the Project need, and if appropriate also compared reliability, potential impact to environmental factors, and cost. The five categories of alternatives considered included: (1) no-build alternative; (2) the proposed Project; (3) alternative POD locations; (4) use of CNG and LNG; and (5) non-pipeline alternatives including emerging technologies. The alternatives analysis demonstrates that, consistent with Siting Board standards and precedent, the proposed POD in Longmeadow and proposed gas pipeline to Bliss Street, together comprising the Project, are the superior alternative to meet the identified need, in a reliable, least-cost and least-environmental-impact manner.

4.0 ROUTE SELECTION PROCESS

4.1 Overview of Route Selection Process

This section describes the process that was conducted to select a Preferred Route, a Noticed Alternative Route and several noticed variations for the Project. The route selection process involved the following primary steps:

- Identify a study area for route selection;
- Identify and screen potential routes and route variations that would connect to the Project start and endpoints;
- Identify candidate routes for scoring based on construction and environmental criteria; and
- Select a Preferred Route, Route Variations and a Noticed Alternative Route based on a balancing of cost, reliability and environmental impacts.

A Project Study Area was established to select a pipeline route that allowed for connection of the Bliss Street Regulator Station in Springfield to the new POD at the TGP interconnection. This Study Area is shown on Figure 4-1 and is described further in Section 4.2. Within this Study Area, the Company applied general routing guidelines to select potential routes for further evaluation. These guidelines included:

- The use of existing ROWs is preferable to obtaining new easements on private properties;
- A shorter pipeline length is preferable to a longer pipeline length;
- Direct routes are preferred over circuitous routes; and
- Conventional pipeline construction methods (i.e., open cut trench) are preferred over more complex installation techniques such as HDD or jack and bore.

4.2 Study Area

4.2.1 Overview

The Project starts at the Longmeadow POD, along TGP's existing transmission line easement in Longmeadow, and extends northward up to the Bliss Street Regulator Station in Springfield. The Study Area was constrained to the area between and within a feasible distance east and west from these two station locations to avoid adding unreasonable pipeline length, cost and environmental impacts to the overall route. The Study Area is depicted on Figure 4-1.

4.2.2 Routing Opportunities

The Company used a combination of available mapping (e.g., USGS, aerial photography) and site reconnaissance to identify potential linear corridors that could be used for routing the pipeline. Based on this review, linear corridors available for potential routing in the Study Area include:

- Interstate Route 91 ("I-91");
- North/south Connecticut River Mainline Railroad along the Connecticut River;
- Other various street ROWs; and
- TGP easement running east/west along the southern limit of the Study Area.

Because of the urban environment within the Study Area, there were no continuous or connected opportunities for a cross-country route alternative that did not involve substantial work and siting within wetland resource areas or through residential properties. The Company's routing analysis focused on the available linear corridor options for the pipeline route selection analysis.

4.2.3 Routing Constraints

There are several routing constraints within the Study Area. These include:

1. need to interconnect at the proposed POD in Longmeadow and the Bliss Street Regulator;
2. the potential crossing of the City of Springfield's Forest Park/Article 97 Land; and
3. the potential crossing and use of I-91 and the railroad ROW that runs north to south.

Primary siting constraints are depicted on Figure 4-2.

4.2.3.1 Interconnection at Point of Delivery with the TGP system and the Interconnection with the Bliss Street Regulator.

The Project is needed to provide necessary system reliability and a second independent source of gas supply to the Greater Springfield Area, which is currently supplied by a single source of gas. To meet the Project purpose and need, the pipeline must connect with the POD along the TGP system to the south (TGP's blanket construction certificate, 20 FERC ¶ 62,409 (1982), and MEPA Certificate No. 15879) and connect with the Bliss Street Regulator Station to the north.

The Bliss Street Regulator Station is a large district regulator station that supports multiple distribution pressure systems in the area and is the terminus of the existing single source of supply. By connecting the Bliss Street Regulator Station to a second source of supply, a looped system is created that will provide the necessary reliability. Thus, all potential routes have these common starting and ending points.

4.2.3.2 Forest Park

A primary constraint encountered when considering routes for the pipeline from the Longmeadow POD north to the Bliss Street Regulator Station is Forest Park located in the City of Springfield. The park property extends east approximately 1.6 miles from I-91 to Dickenson Street and encompasses land extending north and south along Porter Lake and associated wetlands and tributaries. Two existing roads cross north/south through Forest Park: Route 5 (Longmeadow Road) and Magawiska Road, through which runs Eversource's existing 12-inch gas line. North Magawiska Road is a road for automobiles in the north half of the park and then becomes a walking path closed to vehicle traffic in the south side of the park (South Magawiska Road; see Figure 4-2).

Construction through the park would cause temporary impacts associated with excavation work, including noise and dust, and park access issues with the temporary closing of Magawiska Road. In addition, to the extent that an easement would be needed for locating facilities in this area, work within Forest Park would require Article 97 authorization (since it is designated parkland),

which would be a lengthy and uncertain process requiring both local and state legislative approval.[26]

4.2.3.3 Residential Areas

Densely populated residential areas are found throughout the Study Area, with Springfield having a higher population density than Longmeadow. Moreover, the residential areas in Springfield are all within mapped EJ communities: See Environmental Justice Map at Figure 1-4. There are also several multi-family residential areas located in the Study Area. These residential areas constrain the ability to route the pipeline outside of existing roadways or easements without the need for new easements on private properties. In addition, routing the pipeline outside of roadways and easements may place the new line closer to homes and require additional tree/land clearing and more disruption to many more residential property owners.

4.2.3.4 Interstate 91 (I-91) and Railroad ROW

Both I-91 and the railroad ROW are linear corridors considered for potential routes in the western portion of the Study Area. Crossing I-91 and the railroad depending on location would require trenchless crossing techniques that would introduce additional logistical constraints due to constructability requirements. Work longitudinally in the I-91 easement is not stated as an allowable use as specified in the MassDOT's Utility Accommodation Policy for State Highways. However, under that policy, a longitudinal pipeline installation within a limited-access highway subject to MassDOT authority may be allowed if it can be demonstrated that no other practical route alternatives are available. Eversource is working closely with MassDOT to evaluate the potential use of the I-91 corridor. Use of the railroad ROW would affect wetlands and still require use of the I-91 corridor based on the configuration of the infrastructure in this area (see Route 5 on Figures 4-2 and 4-5).

4.3 Facilities Common to All Routes

The proposed Project includes creation of the Longmeadow POD and modification of the Bliss Street POD. Both are common to all routes and do not factor into the routing analysis. They are described in Section 1 and their impacts are assessed in Section 5.

4.4 Route Selection Guidelines

Eversource considered the following guidelines in selecting a route that minimizes impacts to both the natural and human environment while meeting constructability and operational demands at the lowest cost.

4.4.1 Environmental Factors

Eversource assessed potential impacts to several natural and human factors as it evaluated potential routes. These factors included:

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[26] Article 97 lands have been acquired for conservation or recreational purposes and are protected under Article 97 of the Amendments to the Massachusetts Constitution, the Public Lands Protection Act. Prior to seeking the required two-thirds vote of the Massachusetts Legislature for a potential easement within the City's parklands, the Company would require authorization for the necessary property rights in Forest Park from the City of Springfield.

- Natural Environmental Factors
    - Wetlands
    - Streams
    - "NHESP Priority Habitat crossed by or adjacent to the pipeline alignments; and,
    - Tree clearing.
- Human Environmental Factors
    - Residences crossed or adjacent to the pipeline alignments;
    - Commercial and Industrial properties;
    - Sensitive receptor disruption (i.e., schools, colleges and universities, long-term care residences, and community health centers);
    - Recreational, open space land and Article 97-protected lands;
    - Potential for traffic congestion;
    - Public transportation;
    - Subsurface contamination; and
    - Historic resources.

Other environmental resources were also evaluated within the Study Area including Outstanding Resource Waters, Areas of Critical Environmental Concern ("ACECs"), Wellhead Protection Areas and NHESP Estimated Habitat. However, none of the potential routes would affect these resources, so they were excluded from further analysis in Section 4.0.

4.4.2 Constructability Factors

Several constructability factors were considered when selecting potential pipeline routes. These factors are listed below.

- Route length;
- Utility density (number of utilities located within roadways);
- ROW width of the roads used for the pipeline routes; and
- Work in I-91 or Railroad ROWs (new crossings of I-91 and or the railroad ROW along with longitudinal work along I-91, where bridges or underpasses are unavailable for crossing).

4.4.3 Cost Considerations

Cost was also considered as it is important that Project costs are minimized to the extent possible to minimize the cost to consumers. The total cost of the Project is affected by many variables such as:

- Pipe length;
- Pipe diameter;
- Pipe offsets from existing utilities;
- Pipeline crossings requiring special construction techniques such as jack-and-bore, HDD, and the crossing of wetlands, streams, and other utilities;

- Rock hammering and removal;
- Management and disposal of contaminated soil and groundwater;
- Acquisition of permanent easement;
- Acquisition of temporary construction workspace easement;
- In-street work requiring traffic management and police details;
- Post-construction street paving; and
- Site restoration including loam, seeding and plantings.

4.5 Description of Alternative Routes

Following an initial screening of potential route candidates, Eversource identified potential routes with several variations within the Study Area (see Figures 4-1 to 4-5 which shows all the routes).

4.5.1 Format of Routing Assessment

Because of the number of routes available and their geographic configuration, this section includes one assessment of routes from the Longmeadow POD up to Sumner Avenue in Springfield, and then an additional assessment of routes extending from Sumner Avenue north to the Bliss Street Regulator Station where the gas pipeline ends. Eversource conducted the analysis this way because of Forest Park and the natural way it divides up the study area and potential routes (see Figure 4-2).

The Company notes that the southern route variations along the west side of Forest Park end at the intersection of Sumner Avenue and Longhill Street in Springfield and the southern route variations along the east side of Forest Park end at the intersection of Sumner Avenue and Beaumont Street in Springfield. This allows for exploration of a full array of northern routes continuing from these two points in order to develop the optimal routes for Preferred Route and Noticed Alternative.

To support the analysis, this section provides two sets of routing descriptions (south and north), followed by two sets of routing analysis tables describing routing impacts with conclusions on each, and then an overall conclusion.

4.5.2 Description of Southern Routes (POD to Sumner Avenue)

4.5.2.1 Alternative Route 1

Alternative Route 1 begins in Longmeadow at the proposed Longmeadow POD off Hazardville Road. The route then extends north along Shaker Road, crosses Williams Street, and continues north along Laurel Street to Forest Glen Road in Longmeadow. The route then extends west along Forest Glen Road to South and North Magawiska Road in Springfield. Alternative Route 1 then extends north along South and North Magawiska Road through Forest Park in Springfield and ends at Sumner Avenue in Springfield. See the description of Northern routes from this point onward at Section 4.5.3.

4.5.2.2 Alternative Route 1A

Alternative Route 1A follows the path of Alternative Route 1 from the Longmeadow POD to Converse Street. Alternative Route 1A then diverges from Alternative 1 at Converse Street, extending west along Converse Street to Longmeadow Street/Route 5 where it extends northward, alongside I- 91 in the I-91 ROW, up Long Hill Street to North Magawiska Road. The route then extends north along Longhill Street and ends at Sumner Avenue in Springfield. See the description of Northern routes from this point onward at Section 4.5.3.

4.5.2.3 Alternative Route 1B

Alternative Route 1B follows the path of Alternate Route 1 from the Longmeadow POD to Converse Street. Alternative Route 1B then diverges from Alternative Route 1, extending northeast along Converse Street to Dickenson Street, extending north along Dickenson Street until Cliftwood Street, then extending southwest and turning northwest along Cliftwood Street until Sumner Avenue in Springfield. See description of Northern routes from this point onward at Section 4.5.3.

4.5.2.4 Alternative Route 2

Alternative Route 2 follows the path of Alternative Route 1 from the Longmeadow POD to Williams Street. Alternative Route 2 then diverges from Alternative Route 1, extending west along Williams Street, north along Longmeadow Street/Route 5 to Forest Glen Road, and then north along Columbus Avenue to an interchange at I-91, along the west boundary of Forest Park. Alternative Route 2 exits the interchange eastbound along Longhill Road, which curves northbound at North Magawiska Road. The route then extends north along Longhill Street and ends at Sumner Avenue in Springfield. See description of Northern routes from this point onward at Section 4.5.3.

4.5.2.5 Alternative Route 2A

Alternative Route 2A follows the path of Alternative Route 2 from the Longmeadow POD to Converse Street. Alternative Route 2 then diverges from Alternative Route 2, extending east along Converse Street to Laurel Street, where it coincides with Alternative Route 1 extending norward through Forest Park to Sumner Avenue in Springfield. See description of Northern routes from this point onward at Section 4.5.3.

4.5.2.6 Alternative Route 2B

Alternative Route 2B follows the path of Alternative Route 2 from the Longmeadow POD to Converse Street. Alternative Route 2 then diverges from Alternative Route 2, extending east along Converse Street to Dickenson Street, extending north along Dickenson Street until Sumner Avenue where it ends in Springfield. See description of Northern routes from this point onward at Section 4.5.3.

4.5.2.7 Alternative Route 3

Alternative Route 3 extends east from the Longmeadow POD, off Hazardville Road and Shaker Road, following the existing TGP easement along Wolf Swamp Road to Frank Smith Road. Alternative Route 3 then extends north along Frank Smith Road, crosses Williams Street and

continues onto Redfern Drive, then extends west along Converse Street to Laurel Street, where it coincides with Alternative Route 1 and goes through Forest Park on South and North Magawiska Road. The route then extends north along Longhill Street and ends at Sumner Avenue in Springfield. See the description of Northern routes from this point onward at Section 4.5.3.

4.5.2.8 Alternative Route 3A

Alternative Route 3A follows the path of Alternative Route 3 from the Longmeadow POD to Laurel Street. Alternative Route 3A then diverges from Alternative Road 3 at Laurel Street, extending west along Converse Street to Longmeadow Street/Route 5 where it coincides with Alternative Route 2A northwards to South Magawiska Road. Alternative Route 3A follows the path of Alternative Route 1 norward to where it ends at Sumner Street in Springfield. See the description of Northern routes from this point onward at Section 4.5.3.

4.5.2.9 Alternative Route 4

Alternative Route 4 extends west from the Longmeadow POD along the existing TGP easement and the southern boundary of the Longmeadow Country Club to Longmeadow Street. The route then extends north along Longmeadow Street to an interchange with I-91 (coinciding with the path of Alternative Route 2), continues along the west boundary of Forest Park, and curves northbound at North Magawiska Road. The route then extends north along Longhill Street and ends at Sumner Avenue in Springfield. See the description of Northern routes from this point onward at Section 4.5.3

4.5.2.10 Alternative Route 5

Alternative Route 5 extends west from the Longmeadow POD along the existing TGP easement and the southern boundary of the Longmeadow Country Club to the east side of the I-91 corridor. Alternative Route 5 then extends north along the east side of the I-91 corridor to Bark Haul Road, extends west along the Bark Haul Road underpass beneath I-91 to Pondside Road. The route then extends north along Pondside Road to Birnie Road and follows Birnie Road west to the Connecticut River Mainline Railroad. Alternative Route 5 then extends north along the east side of the railroad corridor before crossing back over I-91 and following the east side of the I-91 corridor to the Route 5/I-91 interchange (coinciding with the path of Alternative Route 2), along the west boundary of Forest Park, curving northbound at North Magawiska Road. The route then extends north along Longhill Street and ends at Sumner Avenue in Springfield. See the description of Northern routes from this point onward at Section 4.5.3.

4.5.2.11 Alternative Route 6

Alternative Route 6 follows the path of Alternative Route 5 from the Longmeadow POD to Birnie Road west of I-91. Alternative Route 6 diverges from Alternative Route 5 at the Birnie Road intersection, continuing north along Pondside Road to Emerson Road, where the route extends east under I-91 via the Emerson Road underpass. Alternative Route 6 then extends east along Emerson Road to Longmeadow Street (Route 5), extending north along Longmeadow Street to a point where it rejoins the path of Alternative Route 5 at the Route 5/I-91 interchange, (coinciding with the path of Alternative Route 2, 4, and 5), along the west boundary of Forest Park, curving northbound at North Magawiska Road. The route then extends north along Longhill Street and ends at Sumner Avenue in Springfield. See the description of Northern routes from this point onward at Section 4.5.3.

4.5.2.12 Alternative Route 7

Alternative Route 7 follows the path of Alternative Routes 5 and 6 from the Longmeadow POD to Bark Haul Road. Alternative Route 7 diverges from Alternative Routes 5 and 6 at Bark Haul Road, continuing north along the east side of the I-91 corridor to the Route 5/I-91 interchange (coinciding with the path of Alternative Routes 2, 4, and 5), along the west boundary of Forest Park, curving northbound at North Magawiska Road. The route then extends north along Longhill Street and ends at Sumner Avenue in Springfield. See the description of Northern routes from this point onward at Section 4.5.3.

4.5.2.13 Alternative Route 8

Alternative Route 8 follows Alternative Route 3 east from the Longmeadow POD, off Hazardville Road and Shaker Road, following the existing TGP easement along Wolf Swamp Road to Frank Smith Road. Alternative Route 8 then extends north along Frank Smith Road, crosses Williams Street and continues onto Redfern Drive then extends northwest along Converse Street to Dickinson Street, where it diverges from Alternative Route 3. Alternative Route 8 then extends north along Dickenson Street until Sumner Avenue in Springfield at which point it ends. See description of Northern routes from this point onward at Section 4.5.3.

4.5.3 Description of Northern Routes (Sumner Avenue to Bliss Street Regulator)

4.5.3.1 Alternative Route NA1

Alternative Route NA1 begins at the intersection of Longhill Street and Sumner Avenue and follows Longhill Street and East Columbus Avenue northward to State Street, where it turns west under the I-91 overpass. The route then follows Hall of Fame Avenue south to the Bliss Street Regulator in Springfield.

4.5.3.2 Alternative Route NA2

Alternative Route NA2 begins at the intersection of Sumner Avenue and Beaumont Street, then follows Sumner Avenue west until Longhill Street. The route then follows Longhill Street and East Columbus Avenue northward to State Street, where it turns west under the I-91 overpass. The route then follows Hall of Fame Avenue south to the Bliss Street Regulator in Springfield.

4.5.3.3 Route Alternative NB1

Alternative Route NB1 begins at the intersection of Longhill Street and Sumner Avenue and follows Longhill Street northward until Main Street. The route then follows Main Street west under the I-91 overpass and extends northward along Hall of Fame Avenue to the Bliss Street Regulator in Springfield.

4.5.3.4 Route Alternative NB2

Route Alternative NB2 begins at the intersection of Beaumont Street and Sumner Avenue and follows Sumner Avenue west to Longhill Street. The route then follows Longhill Street northward until Main Street, follows Main Street west under the I-91 overpass and extends northward along W. Columbus Avenue to the Bliss Street Regulator in Springfield.

4.5.3.5 Route Alternative NC1

Route Alternative NC1 begins at the intersection of Longhill Street and Sumner Avenue and then follows Sumner Avenue east to Fort Pleasant Avenue. The route then follows Fort Pleasant Avenue north to Locust Street and follows Locust Street and Main Street north and northwest to State Street. The route then follows State Street west under the I-91 overpass to East Columbus Avenue, and then follows Hall of Fame Avenue south to the Bliss Street Regulator in Springfield.

4.5.3.6 Route Alternative NC2

Route Alternative NC2 begins at the intersection of Beaumont Street and Sumner Avenue and follows Sumner Avenue west to Fort Pleasant Avenue. The route then follows Fort Pleasant Avenue north to Locust Street and follows Locust Street and Main Street north and northwest to State Street. The route then follows State Street west under the I-91 overpass to East Columbus Avenue, and then follows Hall of Fame Avenue south to the Bliss Street Regulator in Springfield.

4.5.3.7 Route Alternative ND1

Route Alternative ND1 begins at the intersection of Longhill Street and Sumner Avenue and then follows Sumner Avenue east to Beaumont Street. The route then follows Beaumont Street north, turns southwest on Belmont Avenue. and follows Belmont Avenue to Locust Street. The route follows Locust Street and Main Street north and northwest to State Street. The route then follows State Street west under the I-91 overpass to East Columbus Avenue, and then follows Hall of Fame Avenue south to the Bliss Street Regulator in Springfield.

4.5.3.8 Route Alternative ND2

Route Alternative ND2 begins at the intersection of Beaumont Street and Sumner Avenue. The route then follows Beaumont Street north, turns southwest on Belmont Avenue and follows Belmont Avenue to Locust Street. The route follows Locust Street and Main Street north and northwest to State Street. The route then follows State Street west under the I-91 overpass to East Columbus Avenue, and then follows Hall of Fame Avenue south to the Bliss Street Regulator in Springfield

4.5.4 Analysis of Candidate Routes

This section discusses Eversource's analysis of the Candidate Routes based on various considerations, including satisfying the Project purpose and need, the general route selection guidelines discussed in Section 4.4, construction constraints, environmental resources, impacts to landowners, and other factors as discussed more specifically below. Table 4-1 lists the Candidate Routes. See Figures 4-2, 4-3, 4-3A, 4-4 and 4-5).

Table 4-1: Candidate Routes included in Scoring Analysis

Candidate Route	Length (Miles)
Southern Portion of Routes (POD to Sumner Avenue)	
Alternative Route 1	3.51
Alternative Route 1A	3.96

Table 4-1: Candidate Routes included in Scoring Analysis	
Candidate Route	**Length (Miles)**
Southern Portion of Routes (POD to Sumner Avenue)	
Alternative Route 1B	4.91
Alternative Route 2	4.15
Alternative Route 2A	4.30
Alternative Route 2B	5.69
Alternative Route 3	5.41
Alternative Route 3A	5.85
Alternative Route 4	4.52
Alternative Route 5	5.24
Alternative Route 6	5.62
Alternative Route 7	4.93
Alternative Route 8	4.95
Northern Portion of Routes (Sumner Avenue to Bliss Street Regulator)	
Route NA1	1.48
Route NA2	2.29
Route NB1	1.30
Route NB2	2.11
Route NC1	1.91
Route NC2	2.44
Route ND1	2.98
RouteND2	2.17

4.5.5 Environmental Criteria (Natural and Human)

Environmental criteria include both natural environmental criteria and human environmental criteria.

The following natural environmental criteria were included in the routing analysis:

1. Wetland resource crossings;
2. Stream crossings;
3. Protected Habitat; and
4. Tree clearing;

The following human environmental criteria were included in the routing analysis;

1. Number of residential structures and units on parcels crossed by the existing easement or on parcels abutting roads used by the routes;
2. Number of commercial/industrial units on parcels crossed by the existing easement or on parcels abutting roads used by the routes;

3. Sensitive receptors;
4. Recreational, open space, and Article 97-protected lands;
5. Potential for traffic congestion;
6. Public transportation routes;
7. Subsurface contamination; and
8. Historic resources.

4.5.6 Constructability Criteria

The following constructability criteria were included in the routing analysis:

1. Route length;
2. Utility density;
3. Road ROW; and
4. Complex crossings (i.e., HDD or open cut construction within I-91 layout)

4.5.7 Description of Environmental Criteria

The following section describes each criterion evaluated and the methodology for assessment.

4.5.7.1 Wetland and Stream Crossings

Wetland and stream crossings were evaluated for each Candidate Route using available MassDEP wetland data from MassGIS (see Figure 4-6 and Figure 4-6a). For wetlands, impacts were assessed by calculating the total length of wetlands crossed. For streams, the number of streams crossed or within 100' of the work were added together for each Candidate Route. Because streams crossings in natural areas can have substantially more impact to natural resources than those of in-street culverted crossings, a separate category for natural stream crossing and in-road existing culverted stream crossings was provided to allow for different weightings of these issues (see Table 4-2 in Section 4.5.10).

4.5.7.2 Protected Habitats

Protected habitat crossings were evaluated for each Candidate Route using available Massachusetts NHESP from MassGIS (see Figure 4-7 and 4-7a). Habitat types used for the assessment included only NHESP priority Habitat of Rare Species as NHESP Estimated Habitat of Rare Wildlife is not present along any of the routes. Impacts were assessed by calculating the total length of habitat area crossed by this criterion.

4.5.7.3 Tree Clearing

Areas of tree clearing were estimated for each Candidate Route using available aerial imagery.

4.5.7.4 Residential Units

Residences along the Candidate Routes could be affected during construction by Project construction-phase activities including noise and temporary traffic disruptions. Most residences in the Study Area consist of single-family homes, but there are some apartment and condominium

complexes as well as a senior retirement community. This criterion considered these impacts by counting residential units within 100 feet of the routes. Residences were counted using a combination of MassGIS data, aerial photography, municipal data and on-site reconnaissance.

4.5.7.5 Commercial/Industrial Units

Commercial and industrial businesses along Candidate Routes could be affected during construction by Project construction-phase activities including noise and temporary traffic disruptions. This criterion considered these impacts by counting Commercial/Industrial units within 100 feet of the routes, or on parcels abutting ROWs used by the routes. Commercial/Industrial units were counted using a combination of MassGIS data, aerial photography, municipal data and on-site reconnaissance.

4.5.7.6 Sensitive Receptors

Sensitive receptors located within the Study Area include schools (pre-K through high school), colleges and universities, long-term care residences, and community health centers. Users of these facilities could be affected by construction noise and dust and temporary disruption to local traffic.

Sensitive receptors were identified and counted on parcels crossed by the easement as well as parcels directly abutting roads used by the Candidate Routes (see Figures 4-9 and 4-9a). Receptors were counted using a combination of MassGIS data, aerial photography and on-site reconnaissance.

4.5.7.7 Recreational, Open Space, and Article 97 Lands

Recreational, open space, and Article 97 lands along the candidate routes could be affected during construction by Project activities including vegetation clearing within the easement, soil grading, trench excavation, noise and fugitive dust. Open space and Article 97 lands were inventoried along the Candidate Routes using MassGIS data, aerial photography, state agency and municipal property records, and on-site reconnaissance. Open space lands crossed by the Candidate Routes in Longmeadow include the Town Green, several conservation parcels, two water supply land parcels, and the Connecticut River Greenway State Park. Open space land crossed by the Candidate Routes in Springfield include Forest Park and Riverfront Park (see Figures 4-8 and 4-8a).

Impacts to open space land and Article 97 lands were assessed in two ways. First, direct impacts to these were considered (e.g., where a route physically crosses open space or Article 97 jurisdiction). In addition, the Company developed a second criterion to address impacts where routes traverse adjacent to or within 100 feet of conservation land and/or Article 97 land. The first criterion considers the significant restrictions and regulatory issues involved in directly crossing Article 97 land, and the second criterion helps to weigh issues associated with installing a gas pipeline in roadways adjacent to or within 100 feet of conservation land and/or Article 97 land.

4.5.7.8 Potential for Traffic Congestion

Traffic congestion on area roads could be increased from daily construction vehicle trips, lane closures and detours during road crossings and in-street construction of the pipeline. To evaluate relative traffic impacts, the Company acquired traffic information from the MassDOT roadway

layer data that defines road type based on its functional roadway class. Traffic congestion impacts were assessed by assigning a traffic congestion score of 1, 2, 3, or 4 to each roadway affected by the routes, which are then analyzed and converted to ratio scores. Scoring for each road was based on the type of roadway in the local area (i.e., interstate, principal arterial, minor arterial, major collector, and local). A score of 1 was assigned to local feeder roads that generally support local neighborhood traffic such as Forest Glen Road. A score of 2 was assigned to collector roads in the Study Area such as Wolf Swamp Road, Union Street, Mill Street, and sections of Dickinson Street, Laurel Street, and Forest Glen Road. A score of 3 was assigned to minor arterial roads with higher levels of traffic volume. These include sections of East Columbus Avenue, Hazardville Road, Laurel Street, Longhill Street, Main Street, Shaker Road, Williams Street, Dickinson Street, Dwight Road, Maple Street, and Tiffany Street. A score of 4 was assigned to highways and expressways such as Interstate 91 and associated on- and-off ramps, and sections of Longhill Street, Columbus Avenue, and Longmeadow Street. Routes adjacent to highways and expressways such as Interstate 91 were considered a factor in determining the potential for traffic congestion. The total raw score for each route was calculated by multiplying the total length of each pipeline route within each roadway by the traffic score assigned to that road (i.e., 1, 2, 3, or 4).

4.5.7.9 Public Transportation Routes

Potential impacts to users of public transportation resources in the Study Area include temporary disturbance from construction-related noise or increased traffic congestion due to in-street work. Public transportation resources in the Study Area include Pioneer Valley Transit Authority ("PVTA") Bus Route 14 (R14), G5, and the Loop. The bus routes are described in Section 5.4.3 below. Potential impacts to PVTA Bus Routes were assessed by calculating the length of roadways affected by the Candidate Routes (crossed or in-street routing) along roads used by the bus route.

4.5.7.10 Subsurface Contamination

A review of the MassGIS data for Activity and Use Limitations ("AUL") sites, Chapter 21E sites, underground storage tanks ("USTs"), and landfills (active, inactive, and closed) was performed to determine the potential to encounter subsurface contamination along the proposed Candidate Routes (see Figure 4-10 and 4-10a). For AULs and 21E sites, routes that crossed these sites or crossed properties abutting the routes were included. For the landfill sites, routes that crossed within ¼ mile of landfills were included to account for larger potential area for contaminated groundwater associated with these areas. Higher densities of AUL sites and Chapter 21E sites are in the northern portion of the Study Area, north of Forest Park in Springfield. No Chapter 21E sites were identified within 100 feet of the proposed Candidate Routes. Landfills are in the southwest portion of the study area in proximity to routes 5, 6 and 7.

4.5.7.11 Historic Resources

Historic resources could potentially be affected by Project-related construction impacts such as vegetation clearing, soil grading, trench excavation, noise, dust and/or traffic congestion. Known historic resource sites crossed or on properties adjacent to the Candidate Routes were evaluated. Historic resources included in the review included National Register of Historic Places ("NRHP"), Preservation Restriction, Massachusetts Historic Landmark, Local Historic District ("LHD"), and NRHP and LHD points (see Figures 4-11 and 4-11a). Resources were identified using the

Massachusetts Cultural Resource Information System ("MACRIS") Maps data layer available through MassGIS.

4.5.8 Description of Constructability Criteria

4.5.8.1 Route Length

This criterion was evaluated because shorter pipeline routes generally affect fewer landowners and result in less overall disturbance to the public when compared to longer lengths of pipe. The length of pipeline in miles was calculated for each Candidate Route.

4.5.8.2 Utility Density

This criterion was evaluated because a higher density of utilities encountered during pipeline construction generally results in a slower rate of construction production, more complex and costly construction and a higher chance of encountering third-party damage. A desktop analysis was conducted via Longmeadow GIS data to evaluate potential utility density along the candidate routes in Longmeadow with information on candidate routes in Springfield obtained via in the field survey. Evaluated utilities included overhead and underground electric, water, sewer, natural gas, and drainage lines. Utility density was calculated by taking the number of utilities in each road, divided by the ROW width in that road, multiplied by the length of that road, adding this together for all the roads in the route, and then dividing by total route length to get average utility density for the route (e.g., average number of utilities/foot of ROW width).

4.5.8.3 ROW Width

ROW width along the route was considered as it factors into constructability, with wider ROWs allowing for easier construction procedures and potentially not requiring detours or road closings. ROW Width was obtained via MassDOT data and confirmed on GIS.

4.5.8.4 Complex Crossings

This criterion was evaluated because a new crossing of I-91 would require utilizing trenchless construction methods which increases Project costs, slows the rate of construction, and can necessitate nighttime construction activity and noise. Eversource sited the alternative routes to utilize existing underpasses beneath I-91 to the extent practicable to avoid a new trenchless crossing of I-91. Several of the routes designed to avoid impacts to Forest Park do require siting on a short longitudinal segment of I-91 and thus would require directional drilling and the referenced associated impacts of such.

4.5.9 Ratio Scoring Methodology

A ratio scoring method was used to rate the route with the highest potential for impact with a score of "1". Other routes were scored based on their relationship to that highest score. Ratio scores were calculated by dividing the individual route score for a given criteria by the highest individual route score for that Candidate Route. For example, in evaluating the wetland impact criteria, if Route A crosses 500 feet of wetland, Route B crosses 100 feet and Route C crosses 50 feet, the ratio score for Route A would be "1.0," the score for Route B would be "0.2," and the ratio score for Route C would be "0.1." The highest score of 1.0 represents the highest potential impact for that criterion.

4.5.10 Environmental and Constructability Weighting

Each criterion was weighted to reflect relative importance to the Project and the surrounding area. Weighting the criteria ensures that the proper level of significance is assigned based on the specifics of the Project. For this Project, a weight of "1" was assigned to criteria deemed to have a lower relative importance to the overall scoring methodology as compared to those weighted a "3," which had the highest level of importance to the route selection process. Table 4-2 lists the weights assigned to each criterion from highest impact to lowest.

Table 4-2: Route Evaluation Criteria Weighting

Criteria	Assigned Weight
Human Environmental	
Number of Residences	3
Number of Commercial/Industrial Parcels	3
Number of Sensitive Receptors	3
Article 97 Lands Crossed	3
Potential for Traffic Congestion (Ratio Score)	3
Recreational, and Open Space Land Uses Abutting Route	1
Public Transportation Routes (Miles)	1
Subsurface Contamination	1
Historic Resources (Number of Inventory Points)	1
Natural Environmental	
DEP Wetlands Crossed (Linear Feet)	3
DEP Stream Crossings in Existing Roads (Number of Crossings)	1
DEP Stream Crossings in Natural Areas (Number of Crossings)	3
NHESP Priority Habitat of Rare Species (Miles)	2
Tree Clearing (Acres)	2
Constructability	
Route Length (Miles)	3
Utility Density	2
Road ROW Width (Average) (Feet)	2
Crossing of Interstate (Count)	2

4.5.10.1 Constructability, Human Environment, and Natural Environment Comparison – Southern Routes (POD to Sumner Avenue)

Eversource applied the criteria and weighting described above to calculate raw scores and ratio scores for each Candidate Route. The results of this analysis are provided in a summary table for each route (Table 4-3) and more detailed tables breaking down the scores by route (Tables 4-4, 4-5, and 4-6). After the tables, additional narrative is provided explaining the results.

Table 4-3: Candidate Route Scoring Summary (Southern Routes POD to Sumner Avenue)			
Route	**Total Percentage Ratio Score**	**Total Ratio Weighted Score**	**Total Weighted Ratio Score Rank**
Alternative Route 1	5.48	10.97	2
Alternative Route 1A	4.99	9.87	1
Alternative Route 1B	7.24	15.13	8
Alternative Route 2	7.30	14.40	3
Alternative Route 2A	7.96	15.66	7
Alternative Route 2B	9.86	20.09	13
Alternative Route 3	6.80	15.11	6
Alternative Route 3A	6.63	14.68	5
Alternative Route 4	8.25	16.06	10
Alternative Route 5	10.45	19.93	12
Alternative Route 6	10.13	18.72	11
Alternative Route 7	7.03	15.12	4
Alternative Route 8	7.08	15.69	9

Table 4-4: Alternative Routing Matrix for Southern Routes - Criteria

Criteria	Alternative Route 1	Alternative Route 1A	Alternative Route 1B	Alternative Route 2	Alternative Route 2A	Alternative Route 2B	Alternative Route 3	Alternative Route 3A	Alternative Route 4	Alternative Route 5	Alternative Route 6	Alternative Route 7	Alternative Route 8	Max Value	Min Value
Constructability															
Route Length (Miles)	3.51	3.96	4.91	4.15	4.3	5.69	5.41	5.85	4.52	5.24	5.62	4.93	4.95	5.85	3.51
Utility Density "Along New 16-inch line" (no. of utilities in the streets)	0.06	0.05	0.06	0.06	0.07	0.06	0.06	0.05	0.04	0.01	0.03	0.01	0.06	0.07	0.01
Row Width (Average) (Feet)	55	72	75	67	63	77	60	70	65	73	63	67	68	77	55
Crossing of Interstate ROW (Count)	1	1	0	1	1	0	1	1	0	2	1	0	0	2	0
Human Impacts															
Number of Residences	232	263	848	211	251	869	402	443	235	100	181	133	871	871	100
Number of Commercial/Industrial Parcels	1	3	23	9	7	29	1	3	11	1	7	1	23	29	1
Sensitive Receptor Disruption (# of Receptors)	0	0	1	3	3	4	3	3	3	0	0	0	2	4	0
Article 97 Lands Crossed	1	0	1	0	1	1	1	0	1	5	4	4	1	5	0
Open Space Lands/ Article 97 Lands (# of Lands within 100 ft)	4	4	6	2	4	6	3	3	5	10	9	10	3	10	2
Public Transportation (Miles)	0	0.3	2.39	1.05	1.34	3.74	1.19	1.49	2.05	0	0.54	0	1.73	3.74	0
Potential for Traffic Congestion	7.65	10.94	13.08	12.56	11.05	16.48	11.87	15.18	10.79	6.23	8.5	4.06	11.71	16.48	4.06
Subsurface Contamination															
Activity and Use Limitations (AUL) (# of Sites)	0	0	0	3	3	3	0	0	3	0	2	0	0		
Chapter 21E Sites (# of Sites)	0	0	0	0	0	0	0	0	0	0	0	0	0		
Underground Storage Tanks (# of Sites)	1	1	3	2	2	4	1	1	1	4	2	0	3		
Landfills (# of Sites within 1/4 mile)	0	0	0	0	0	0	0	0	0	4	4	3	0		
Subsurface Contamination Subtotal	1	1	3	5	5	7	1	1	4	8	8	3	3	8	1
Historic Areas (MHC Data) (# of Structures)	15	20	0	28	27	12	15	20	37	15	18	15	0	37	0
Environmental															
DEP Wetlands Crossed (Linear feet)	0	0	0	0	0	0	0	0	165	3,491	718	1,305	0	3491	0
DEP Stream Crossing (# of Culvert Crossings in roads)	3	3	4	4	4	5	2	2	4	4	5	1	3	5	1
DEP Stream Crossing (# of Crossings in undisturbed area)	0	0	0	0	0	0	0	0	1	3	2	4	0	4	0
NHESP Priority Habitat of Rare Species (Miles)	0	0	0	0	0	0	0	0	0	1.18	1.3	0	0	1.3	0
Tree Clearing (Acres)	0.47	0.82	0.47	0.82	0.47	0.47	0.47	0.82	7.16	12.99	9.36	15.41	0.47	15.41	0.47

Table 4-5: Alternative Routing Matrix for Southern Routes – Percentage Scoring

Criteria	Alternative Route 1	Alternative Route 1A	Alternative Route 1B	Alternative Route 2	Alternative Route 2A	Alternative Route 2B	Alternative Route 3	Alternative Route 3A	Alternative Route 4	Alternative Route 5	Alternative Route 6	Alternative Route 7	Alternative Route 8
Constructability													
Route Length	0.60	0.68	0.84	0.71	0.74	0.97	0.92	1.00	0.77	0.90	0.96	0.84	0.85
Utility Density (no. of utilities in the streets)	0.86	0.71	0.86	0.86	1.00	0.86	0.86	0.71	0.57	0.14	0.43	0.14	0.86
Row Width (Average)	1.00	0.23	0.09	0.45	0.64	0.00	0.77	0.32	0.55	0.18	0.64	0.45	0.41
Crossing of Interstate ROW (Count)	0.50	0.50	0.00	0.50	0.50	0.00	0.50	0.50	0.00	1.00	0.50	0.00	0.00
Human Impacts													
Number of Residences	0.27	0.30	0.97	0.24	0.29	1.00	0.46	0.51	0.27	0.11	0.21	0.15	1.00
Number of Commercial/Industrial Parcels	0.03	0.10	0.79	0.31	0.24	1.00	0.03	0.10	0.38	0.03	0.24	0.03	0.79
Sensitive Receptor Disruption	0.00	0.00	0.25	0.75	0.75	1.00	0.75	0.75	0.75	0.00	0.00	0.00	0.50
Article 97 Lands Crossed	0.20	0.00	0.20	0.00	0.20	0.20	0.20	0.00	0.20	1.00	0.80	0.80	0.20
Open Space Lands/ Article 97 Lands (# of Lands within 100 ft)	0.40	0.40	0.60	0.20	0.40	0.60	0.30	0.30	0.50	1.00	0.90	1.00	0.30
Public transportation (length of route along bus route)	0.00	0.08	0.64	0.28	0.36	1.00	0.32	0.40	0.55	0.00	0.14	0.00	0.46
Potential for Traffic Congestion	0.46	0.66	0.79	0.76	0.67	1.00	0.72	0.92	0.65	0.38	0.52	0.25	0.71
Subsurface Contamination													
Activity and Use Limitations (AUL)													
Chapter 21E Sites													
Underground Storage Tanks													
Landfills (# of sites within 1/4 mile)													
Subsurface Contamination Subtotal	0.13	0.13	0.38	0.63	0.63	0.88	0.13	0.13	0.50	1.00	1.00	0.38	0.38
Historic Areas (MHC Data) (structures within 100ft)	0.41	0.54	0.00	0.76	0.73	0.32	0.41	0.54	1.00	0.41	0.49	0.41	0.00
Environmental													
DEP Wetlands Crossed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	1.00	0.21	0.37	0.00
DEP Stream Crossing (# of Culvert Crossings in roads)	0.60	0.60	0.80	0.80	0.80	1.00	0.40	0.40	0.80	0.80	1.00	0.20	0.60
DEP Stream Crossing (# of Crossings in undisturbed area)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.75	0.50	1.00	0.00
NHESP Priority Habitat of Rare Species	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	1.00	0.00	0.00
Tree Clearing	0.03	0.05	0.03	0.05	0.03	0.03	0.03	0.05	0.46	0.84	0.61	1.00	0.03
Total	**5.48**	**4.99**	**7.24**	**7.30**	**7.96**	**9.86**	**6.80**	**6.63**	**8.25**	**10.45**	**10.13**	**7.03**	**7.08**

Table 4-6: Alternative Routing Matrix for Southern Routes - Weighted Scores

Criteria	Assigned Weight	Alternative Route 1	Alternative Route 1A	Alternative Route 1B	Alternative Route 2	Alternative Route 2A	Alternative Route 2B	Alternative Route 3	Alternative Route 3A	Alternative Route 4	Alternative Route 5	Alternative Route 6	Alternative Route 7	Alternative Route 8
Constructability														
Route Length	3	1.80	2.03	2.52	2.13	2.21	2.92	2.77	3.00	2.32	2.69	2.88	2.53	2.54
Utility Density (no. of utilities in the streets)	2	1.71	1.43	1.71	1.71	2.00	1.71	1.71	1.43	1.14	0.29	0.86	0.29	1.71
Row Width (Average)	2	2.00	0.45	0.18	0.91	1.27	0.00	1.55	0.64	1.09	0.36	1.27	0.91	0.82
Crossing of Interstate ROW (Count)	2	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	2.00	1.00	0.00	0.00
Human Impacts														
Number of Residences	3	0.80	0.91	2.92	0.73	0.86	2.99	1.38	1.53	0.81	0.34	0.62	0.46	3.00
Number of Commercial/Industrial Parcels	3	0.10	0.31	2.38	0.93	0.72	3.00	0.10	0.31	1.14	0.10	0.72	0.10	2.38
Sensitive Receptor Disruption	3	0.00	0.00	0.75	2.25	2.25	3.00	2.25	2.25	2.25	0.00	0.00	0.00	1.50
Article 97 Lands Crossed	3	0.60	0.00	0.60	0.00	0.60	0.60	0.60	0.00	0.60	3.00	2.40	2.40	0.60
Open Space Lands/ Article 97 Lands (# of Lands within 100 ft)	1	0.40	0.40	0.60	0.20	0.40	0.60	0.30	0.30	0.50	1.00	0.90	1.00	0.30
Public transportation (length of route along bus route)	2	0.00	0.16	1.28	0.56	0.72	2.00	0.64	0.80	1.10	0.00	0.29	0.00	0.93
Potential for Traffic Congestion	3	1.39	1.99	2.38	2.29	2.01	3.00	2.16	2.76	1.96	1.13	1.55	0.74	2.13
Subsurface Contamination														
Activity and Use Limitations (AUL)														
Chapter 21E Sites														
Underground Storage Tanks														
Landfills Crossed (# of Sites within 1/4 mile)														
Subsurface Contamination Subtotal	1	0.13	0.13	0.38	0.63	0.63	0.88	0.13	0.13	0.50	1.00	1.00	0.38	0.38
Historic Areas (MHC Data) (structures within 100ft)	1	0.41	0.54	0.00	0.76	0.73	0.32	0.41	0.54	1.00	0.41	0.49	0.41	0.00
Environmental														
DEP Wetlands Crossed	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	2.00	0.41	0.75	0.00
DEP Stream Crossing (# of Culvert Crossings in roads)	1	0.60	0.60	0.80	0.80	0.80	1.00	0.40	0.40	0.80	0.80	1.00	0.20	0.60
DEP Stream Crossing (# of Crossings in undisturbed areas)	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	2.25	1.50	3.00	0.00
NHESP Priority Habitat of Rare Species	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	1.00	0.00	0.00
Tree Clearing	2	0.06	0.11	0.06	0.11	0.06	0.06	0.06	0.11	0.93	1.69	1.21	2.00	0.06
Total		11.00	10.05	16.56	15.00	16.26	22.09	15.46	15.18	16.98	19.97	19.11	15.15	16.94
RANKING		2	1	8	3	7	13	6	5	10	12	11	4	9
		Noticed Variation to Preferred Route No.2	**Preferred Alternative**	**Noticed Alternative**	**Noticed Variation to Preferred Route No.1**									

4.5.10.2 Conclusion from Route Selection Analysis (Southern Routes – POD to Sumner Avenue)

Route 1A (Best Scoring Route)

As shown in Table 4-6, Alternative Route 1A has the lowest (best) weighted score. The primary advantage of Alternative Route 1A is that it follows the existing Route 5 street corridor between two Forest Park parcels and does not directly affect the environmental resources and human uses at Forest Park, nor is it subject to Article 97 jurisdiction. In addition, the existing Route 5 corridor is wider than the North and South Magawiska Road corridor on Alternative Route 1 making it easier for construction. In general, Alternative Route 1A has the least amount of constructability constraints, human impacts, and environmental impacts of the routes assessed.

The disadvantage of this route is that it requires a longitudinal path along a short segment of I-91 ROW, which may require an HDD and associated logistical constraints due to constructability requirements and cost of this construction process. In addition, work longitudinally in the I-91 easement, whether via HDD or conventional trenching methods, is subject to an exception determination under the MassDOT's Utility Accommodation Policy for State Highways, requiring a showing that no other practical route alternatives are available that do not use the highway layout.

For the I-91 portion of the work, Eversource is assessing different types of construction techniques and different designs to minimize traffic and impacts to the roadway, infrastructure, and the environment. These include HDD and open cut trenching. HDD involves no direct disturbance to the roadway surface, but the stringing associated with installation of the pipeline and requirements for the HDD equipment and laydown require closure of both the Route 5 on-ramp and the Route 83 off-ramp to I-91, resulting in traffic impacts and detours. Open cut construction, on the other hand, does impact the roadway surface but may result in less traffic impacts because it can be performed without the need to close the on and off ramps to I-91. The Company has met with DOT to gather input on these different construction methodologies and has provided information to DOT on these two alternatives. A summary of the design approaches assessed as well as documentation of compliance with MassDOT's requirements for siting in the roadway is provided in Attachment F. This information shows the various design alternatives considered by Eversource to minimize impacts associated with construction. The Company is in continuing discussions with MassDOT to evaluate the feasibility of this routing alternative.

Route 1 (2nd Best Scoring Route)

Route 1 has the second-best score after Route 1A. The primary advantage of Alternative Route 1 is that it is the shortest and most direct route to connect the Longmeadow POD to the existing Bliss Street Regulator Station. Also, this route does not have the construction and access permitting issues associated with use of I-91 ROW encountered in Alternative Route 1A.

The disadvantage of Route 1 is that it would cause impacts to Forest Park: Construction through the park would cause temporary human use impacts associated with excavation work, including noise and dust, and park access issues with the temporary closing of Magawiska Road. In addition, work within Forest Park may require land rights subject to Article 97 consistency review and approval, which would be lengthy, uncertain and affect project schedule. Use of Article 97 rights are typically not available when other feasible routing alternatives exist, as they do here.

Route 1B (Best Scoring Option that avoids Both I-91 and Forest Park Constraints

Route 1B does not score as well as the preceding options discussed, or as several others in the scoring matrix, because it is substantially longer than most of the other routes considered and extends through densely populated areas of the study area, thus, positioning it close to a very high number of residences and commercial businesses compared to other routes. Specifically, Route 1B is sited within 100 feet of 947 more residences than Route 1A and within 100 feet of 20 more commercial businesses and one more sensitive receptor, than Route 1A. In addition, because it is longer, it results in more traffic impacts and longer overall construction duration. However, Route 1B is the best scoring route that avoids *both* the construction/design issues with using the I-91 ROW associated with Route 1A and Route 2 and avoids impacts to Forest Park and potential for Article 97 issues associated with Route 1.

Western Routes (4, 5, 6 and 7)

Routes 4, 5, 6, and 7 all score worse than the above routes as they are longer, require tree clearing, cross wetlands and cross Article 97 lands. Routes 5 and 7 also have the disadvantage of the need for a longitudinal use of the I-91 ROW as discussed above with respect to Route 1A. Route 4 also scores less favorably with respect to historic resources, as it crosses along the southern end of Longmeadow Street where there are many historic properties. Route 5, which follows the railroad has constraints associated with siting pipelines adjacent to an active rail line, requires crossing of I-91, and still requires the associated longitudinal work along Route I-91.

Other Routes (2, 2A, 2B, 3, 3A, and 8)

Other routes and route variations including 2, 2A, 2B, 3, 3A, and 8 did not score as well as Routes 1A, 1 and 2 for a variety of reasons as detailed in Table 4-4, 4-5 and 4-6. In general, these routes were located close to a greater number of residences, were longer, and had other additional impacts than those options described above. Routes 2B and 8, which are other options for avoiding both I-91 issues and Forest Park issues, did not score as well as Route 1B, which accomplishes this same objective.

4.5.10.3 Cost Comparison of Southern Routes (POD to Sumner Avenue)

As part of the route analysis process, Eversource prepared high level estimates of the costs associated with constructing each Candidate Route (see Table 4-7). These estimates consider the complexities associated with each route and the differing construction methods.

Table 4-7: Candidate Route Cost Comparison	
Route	**Cost Estimate (millions $)**
Alternative Route 1	39.5
Alternative Route 1A	45.5
Alternative Route 1B	55.2
Alternative Route 2	47.7
Alternative Route 2A	48.3
Alternative Route 2B	64.0
Alternative Route 3	60.8
Alternative Route 3A	65.8
Alternative Route 4	51.8
Alternative Route 5	60.9
Alternative Route 6	65.2
Alternative Route 7	56.4
Alternative Route 8	55.6
Notes: * Routes 1A, 2, 4, 5, 6, and 7 may require longitudinal HDD along I-91 at a significant cost ($1,000,000) -included in the above cost ** Routes 5 & 6 in addition to the potential longitudinal HDD of I-91, may require an HDD perpendicular crossing of I-91 at a significant cost ($2,000,000 total – for the 2 crossings together) - included in the above cost The cost of the Longmeadow POD is approximately $5 million dollars and is applicable to all routing alternatives and not included in the routing costs in this table.	

As Table 4-7 shows, Alternative Route 1 has the lowest estimated construction cost, Route 1A has the 2nd lowest construction cost and Alternative Route 3A has the highest cost. Alternative Routes 1A, 1B, 2, 2A, 2B, 3, 3A, 4, 5, 6, 7, and 8 are longer than Alternative Route 1 and would result in an increase in the estimated Project cost when compared to Alternative Route 1.

4.5.10.4 Reliability Comparison (Southern Routes – POD to Sumner Avenue)

The Company considered whether there was a difference between the routes with regard to reliability. All the gas pipeline alternatives discussed provide a safe and reliable source of gas and would involve the same construction and materials. Moreover, because this would be a dedicated pipeline with no services or other taps between the Longmeadow POD and Bliss Street, there is no variation in pressure or service related to overall length. Lastly, the Company anticipates that all construction, regardless of route, would be completed in one construction season, so there is no relative reliability benefit to one route over another for purposes of in-service date. Therefore, the Company did not distinguish the routes for purposes of route selection based on reliability.

4.5.10.5 Conclusions on Southern Routing Analysis

Route 1A is the optimal route in the southern routing analysis as it meets all Eversource's operational and reliability needs, scores best, and can be constructed at the second lowest cost while minimizing environmental impacts. Route 1 scores second best and meets all Eversource's operational and reliability needs. Route 1B does not score as well as the preceding options discussed, or several others in the scoring matrix, but is the best scoring route that avoids both the construction/design issues with using the I-91 ROW associated with Route 1A and Route 2 and avoids impacts to Forest Park and potential for Article 97 issues associated with Route 1.

These chosen routes will be connected with the results of the northern route selection analysis to be discussed to develop the overall Preferred Route and Noticed Alternative (see section 4.5.10.6.

4.5.10.6 Constructability, Human Environment, and Natural Environment Comparison – Northern Routes Sumner Avenue to Bliss Street Regulator)

Eversource applied the criteria and weighting described above a second time to assess route options in the north. The results of this analysis are provided in a summary table for each route (Table 4-8) and more detailed tables breaking down the scores by route (Table 4-9 4-10, and 4-11). After the tables additional narrative is provided explaining the results.

Table 4-8: Candidate Route Scoring Summary (Northern Routes - Sumner Avenue to Bliss Street Regulator)

Route	Total Percentage Ratio Score	Total Ratio Weighted Score	Total Weighted Ratio Score Rank
Route NA1	4.58	9.36	2
Route NA2	6.60	13.55	4
Route NB1	4.98	8.75	1
Route NB2	6.83	12.79	3
Route NC1	7.25	13.82	5
Route NC2	8.57	15.85	6
Route ND1	10.75	21.09	8
Route ND2	8.59	16.59	7

Table 4-9: Alternative Routing Matrix for Northern Routes - Criteria								
Criteria	**NA1**	**NA2**	**NB1**	**NB2**	**NC1**	**NC2**	**ND1**	**ND2**
Constructability								
Route Length (Miles)	1.48	2.29	1.3	2.11	1.91	2.44	2.98	2.17
Utility Density "Along New 16-inch line" (no. of utilities in the streets)	0.14	0.12	0.07	0.07	0.08	0.08	0.11	0.13
Row Width (Average) (Feet)	54	62	55	66	74	74	63	57
Crossing of Interstate (Count)	0	0	0	0	0	0	0	0
Human Impacts								
Number of Residences	238	585	235	582	663	668	1160	779
Number of Commercial/Industrial Parcels	39	42	17	21	96	95	108	105
Sensitive Receptor Disruption (# of Receptors)	0	2	0	2	3	3	4	2
Article 97 Lands Crossed	0	0	0	0	0	0	0	0
Open Space Lands/ Article 97 Lands (# of Lands)	0	1	0	1	1	2	2	1
Public Transportation (Miles)	0.4	1.07	0.35	1.02	1.47	2.14	2.45	1.79
Potential for Traffic Congestion	4.43	6.87	3.9	6.34	5.21	6.79	8.78	6.34
Subsurface Contamination								
Activity and Use Limitations (AUL) (# of Sites)	4	4	6	4	3	3	3	3
Chapter 21E Sites (# of Sites)	0	0	2	2	0	0	0	0
Underground Storage Tanks (# of Sites)	3	3	4	4	2	2	2	2
Landfills Crossed (# of Sites)	0	0	0	0	0	0	0	0
Subsurface Contamination Subtotal	7	7	12	10	5	5	5	5
Historic Areas (MHC Data) (# of Structures)	26	65	14	53	69	87	96	55
Environmental								
DEP Wetlands Crossed (Linear feet)	0	0	0	0	0	0	0	0
DEP Stream Crossing (# of Crossings - includes crossing in existing roads)	0	0	1	1	1	1	1	1
NHESP Priority Habitat of Rare Species (Miles)	0	0	0	0	0	0	0	0
Tree Clearing (Acres)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 4-10: Alternative Routing Matrix for Northern Routes – Percentage Scoring								
Criteria	**NA1**	**NA2**	**NB1**	**NB2**	**NC1**	**NC2**	**ND1**	**ND2**
Constructability								
Route Length	0.50	0.77	0.44	0.71	0.64	0.82	1.00	0.73
Utility Density (no. of utilities in the streets)	1.00	0.86	0.50	0.50	0.57	0.57	0.79	0.93
Row Width (Average)	1.00	0.60	0.95	0.40	0.00	0.00	0.55	0.85
Crossing of Interstate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Human Impacts								
Number of Residences	0.21	0.50	0.20	0.50	0.57	0.58	1.00	0.67
Number of Commercial/Industrial Parcels	0.36	0.39	0.16	0.19	0.89	0.88	1.00	0.97
Sensitive Receptor Disruption	0.00	0.50	0.00	0.50	0.75	0.75	1.00	0.50
Article 97 Lands Crossed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Space Lands/Article 97 Lands	0.00	0.50	0.00	0.50	0.50	1.00	1.00	0.50
Public transportation (length of route along bus route)	0.16	0.44	0.14	0.42	0.60	0.87	1.00	0.73
Potential for Traffic Congestion	0.50	0.78	0.44	0.72	0.59	0.77	1.00	0.72
Subsurface Contamination								
Activity and Use Limitations (AUL)								
Chapter 21E Sites								
Underground Storage Tanks								
Landfills Crossed								
Subsurface Contamination Subtotal	0.58	0.58	1.00	0.83	0.42	0.42	0.42	0.42
Historic Areas (MHC Data) (structures within 100ft)	0.27	0.68	0.15	0.55	0.72	0.91	1.00	0.57
Environmental								
DEP Wetlands Crossed	0	0	0	0	0	0	0	0
DEP Streams Crossing	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
NHESP Priority Habitat of Rare Species	0	0	0	0	0	0	0	0
Total	**4.58**	**6.60**	**4.98**	**6.83**	**7.25**	**8.57**	**10.75**	**8.59**

Table 4-11: Alternative Routing Matrix for Northern Routes – Weighted Scores									
Criteria	**Assigned Weight**	**NA1**	**NA2**	**NB1**	**NB2**	**NC1**	**NC2**	**ND1**	**ND2**
Constructability									
Route Length	3	1.49	2.31	1.31	2.12	1.92	2.46	3.00	2.18
Utility Density (no. of utilities in the streets)	2	2.00	1.71	1.00	1.00	1.14	1.14	1.57	1.86
Row Width (Average)	2	2.00	1.20	1.90	0.80	0.00	0.00	1.10	1.70
Human Impacts									
Number of Residences	3	0.62	1.51	0.61	1.51	1.71	1.73	3.00	2.01
Number of Commercial/Industrial Parcels	2	0.72	0.78	0.31	0.39	1.78	1.76	2.00	1.94
Sensitive Receptor Disruption	3	0.00	1.50	0.00	1.50	2.25	2.25	3.00	1.50
Article 97 Lands Crossed	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Space Lands/Article 97 Lands	1	0.00	0.50	0.00	0.50	0.50	1.00	1.00	0.50
Public transportation (length of route along bus route)	1	0.16	0.44	0.14	0.42	0.60	0.87	1.00	0.73
Potential for Traffic Congestion	3	1.51	2.35	1.33	2.17	1.78	2.32	3.00	2.17
Subsurface Contamination									
Activity and Use Limitations (AUL)									
Chapter 21E Sites									
Underground Storage Tanks									
Landfills Crossed									
Subsurface Contamination Subtotal	1	0.58	0.58	1.00	0.83	0.42	0.42	0.42	0.42
Historic Areas (MHC Data) (structures within 100ft)	1	0.27	0.68	0.15	0.55	0.72	0.91	1.00	0.57
Environmental									
DEP Wetlands Crossed	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DEP Streams Crossing	1	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
NHESP Priority Habitat of Rare Species	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**9.36**	**13.55**	**8.75**	**12.79**	**13.82**	**15.85**	**21.09**	**16.59**
RANKING		**2**	**4**	**1**	**3**	**5**	**6**	**8**	**7**

4.5.10.7 Conclusion from Route Selection Analysis (Northern Routes – Sumner Avenue to Bliss Regulator)

NB1 (Best Scoring Route Starting at Longhill Street and Sumner Avenue)

Route NB1 is the best scoring route from the intersection Longhill Street and Sumner Avenue to the Bliss Regulator Station. This minimizes the overall environmental criteria outlined in tables 4-9, 4-10 and 4-11. Specifically, it is the shortest route, and has the lowest utility density and potential for traffic congestion, and impacts the smallest number of residences, commercial/industrial businesses, sensitive receptors and historic areas.

NB2 (Best Scoring Route Starting at Beaumont and Sumner Avenue)

Route NB2 is the best scoring route from the intersection Beaumont Street and Sumner Avenue to the Bliss Regulator Station. This route is essentially the same as NB1 but starts further to the east on Sumner Avenue at the intersection of Beaumont and Sumner Avenue.

NA1 (Second Best Scoring Route at Longhill and Sumner Avenue)

Route NA1 is the second-best scoring route from the intersection of Longhill Street and Sumner Avenue to the Bliss Regulator Station. This route is slightly longer than NB1 (0.18 miles longer) and has more impacts with respect to number of residences in proximity to the work (3 more), number of commercial/Industrial businesses (22 more) and other impacts (see tables 4-9, 4-10 and 4-11). The advantage of NA1 is that it has less subsurface contamination and one less culverted stream crossing than NB1.

NA2 (Second Best Soring Route at Beaumont and Sumner Avenue)

Route NA2 is the second-best scoring route form the intersection of Beaumont Street and Sumner Avenue to the Bliss Regulator Station. This route is essentially the same as NA1 but starts further to the east on Sumner Avenue at the intersection of Beaumont and Sumner Avenue.

Other Routes

Other routes located east of Longhill Street/East Columbus and north of Sumner Avenue (e.g., Routes NC1, NC2, ND1 and ND2) pass through a densely settled area of the City and are adjacent to a high number of residences, commercial businesses, sensitive receptors, and historic areas compared to routes NB1, NB2, NA1 and NA2.

4.5.10.8 Cost Comparison of Northern Routes (Sumner Avenue to Bliss Street Regulator)

As part of the route analysis process, Eversource prepared high level estimates of the costs associated with constructing each of the northern Candidate Route (see Table 4-12). These estimates consider the complexities associated with each route and the differing construction methods.

Table 4-12: Candidate Route Cost Comparison – Northern Routes	
Route	**Cost Estimate (millions $)**
Route NA1	16.6
Route NA2	25.7
Route NB1	14.6
Route NB2	23.7
Route NC1	21.5
Route NC2	27.4
Route ND1	33.5
Route ND2	24.4

Table 4-12 shows, routes NB1 is the shortest of the routes in that it follows a straight path and NA1 is the second shortest route and hence these are the least costly and second least costly routes, respectively. The other routes (NA2, NB2, NC1 NC2, ND1 and ND2 are all longer and more costly to construct due to the added length of pipeline.

4.5.10.9 Reliability Comparison (Northern Routes – Sumner Avenue to Bliss Street Regulator Station)

The Company considered whether there was a difference between the northern portion of the routes with regard to reliability. All the gas pipeline alternatives discussed provide a safe and reliable source of gas and would involve the same construction and materials. Moreover, because this would be a dedicated pipeline with no services or other taps between Sumner Avenue and the Bliss Street Regulator, there is no variation in pressure or service related to overall length. Lastly, the Company anticipates that all construction, regardless of route, would be completed in one construction season, so there is no relative reliability benefit to one route over another for purposes of in-service date. Therefore, the Company did not distinguish the routes for purposes of route selection based on reliability.

4.5.10.10 Conclusion on Northern Routing Analysis

Route NB1 is the best scoring route from the intersection Longhill Street and Sumner Avenue to the Bliss Street Regulator and has the lowest cost of the routes from that location. Route NA1 is the second-best scoring route and second least costly route from the intersection Longhill Street and Sumner Avenue. As all routes have the same reliability, NB1 is best for minimizing environmental impacts and cost and Route NA1 is second best.

4.6 Selection of Preferred Route and Noticed Alternative Routes:

4.6.1 Combining Southern and Northern Route Analyses

To allow for overall assessment of the Project, Eversource has matched the best scoring route in the south with the best scoring route in the north (Southern Preferred Route with the Northern Preferred Route and the Southern Noticed Alterative with the Northern Noticed Alternative. In order to allow for flexibility in options for ultimate route selection and approval of the southern routes and northern routes, the Southern Noticed Alternative was extended to the intersection of

Sumner Avenue and Longhill Street (see Figure 4-12 and 4-13). This way all the southern routes end at the same point the northern routes begin (intersection of Longhill Street and Sumner Avenue).

The following table shows the combined results of the scoring and cost analysis for the southern and northern routes.

Table 4-13: Candidate Route Scoring Summary (Southern and Northern Routes)

Routes	Total Weighted Routing Score Rank	Cost Ranking
Southern Routes		
Alternative Route 1	2	1
Alternative Route 1A	1	2
Alternative Route 1B	8	6
Alternative Route 2	3	3
Alternative Route 2A	7	4
Alternative Route 2B	13	11
Alternative Route 3	6	9
Alternative Route 3A	5	12
Alternative Route 4	10	5
Alternative Route 5	12	9
Alternative Route 6	11	10
Alternative Route 7	4	7
Alternative Route 8	9	8
Northern Routes		
Route NA1	2	2
Route NA2	4	6
Route NB1	1	1
Route NB2	3	4
Route NC1	5	3
Route NC2	6	7
Route ND1	8	8
Route ND2	7	5

4.6.2 Selection of Preferred Route and Noticed Alternative for the Northern Routing Assessment

4.6.2.1 Northern Preferred Route

The best scoring route in the northern analysis is route NB1 as it minimizes impacts compared to other routes in this area and has the advantage over the second-best route NA1 because it is shorter and minimizes the number of residences and commercial/industrial properties in proximity to the work. The route also has a lower utility density meaning it will likely require less time to install. Because NB1 is the shortest of the northerly routes, it has the lowest cost. As reliability does not change among routes, NB1 was chosen as the northern Preferred Route since it minimizes both environmental impacts and cost while providing a reliable source of gas (see Figure 4-12).

4.6.2.2 Northern Noticed Alternative

The second-best scoring northerly alternative is NA1, which scored much better than other remaining northerly routes that run along Belmont Avenue and Fort Pleasant Avenue since these other routes traverse a very densely settled portion of the city and cross close to a high number of residences, commercial businesses and are located on more narrow roads, making traffic impacts more likely. Because reliability does not change, NA1 was chosen as the northern Noticed Alternative Route since it is the second best in terms of minimizing environmental impacts and cost, while providing a reliable source of gas (see Figure 4-12).

4.6.3 Selection of Preferred Route and Noticed Alternative for the Southern Routing Assessment

4.6.3.1 Southern Preferred Route (Route 1A, green)

As shown in Table 4-13, Route 1A (see Figure 4-12 – green route) has the lowest (best) weighted score. The primary advantage of Route 1A is that it follows the existing Route 5 street corridor between two Forest Park parcels and does not directly affect the environmental resources and human uses at Forest Park and nor is it subject to Article 97 jurisdiction. In addition, the existing Route 5 corridor is wider than the North and South Magawiska Road corridor on Alternative Route 1 (see Figure 4-12 orange route) making it easier for construction. Route 1A was chosen as the Southern Preferred route as it has the least amount of constructability constraints, human impacts, and environmental impacts of the southern routes and is the second least costly.

The disadvantage of Route 1A (green route) is that it requires a longitudinal path along a short segment of I-91 ROW, which may require an HDD and has associated logistical constraints due to constructability requirements and cost of this construction process. In addition, work longitudinally in the I-91 easement is subject to an exception determination under the MassDOT's Utility Accommodation Policy for State Highways, requiring a showing that no other practical route alternatives are available that do not use the highway. As stated above, the Company is continuing to work with MassDOT to evaluate the feasibility of this routing option.

4.6.3.2 Noticed Variation No. 1 to Southern Preferred Route (blue)

In addition to the Preferred Route described above, Eversource has included Route 2 as Variation No. 1 to the Preferred Route. This route shown in blue in Figure 4-12 scores 3rd on the route

rankings and 3rd in cost of the southern routes. This route was chosen as a noticed variation to the Preferred Route as is adds further geographic diversity to Eversource's chosen routes by evaluating impacts to the more southern part of the study area (e.g., impacts along Williams Street and more southern end of Longmeadow Street) (see Figure 4-12).

4.6.3.3 Noticed Variation No. 2 to the Southern Preferred Route (orange)

Eversource has included Route 1 as a Variation No. 2 to the Preferred Route. Route 1 (shown in orange on Figure 4-12) was chosen as a noticed variation to the Southern Preferred Route as it has the second-best score after Route 1A of the southern routes and has the lowest cost of all the southern routes. The advantage of Alternative Route 1 is that it is the shortest and most direct route to connect the Longmeadow POD to Sumner Avenue and this route does not have the construction and access permitting issues associated with use of I-91 ROW in Alternative Route 1A.

The disadvantage of Route 1 is that it would cause impacts to Forest River Park: Construction through the park would cause temporary human use impacts associated with excavation work, including noise and dust, and park access issues with the temporary closing of Magawiska Road. In addition, work within Forest Park may require land rights subject to Article 97 consistency review and approval at both the local and state level, which would be lengthy, uncertain and affect project schedule.

4.6.3.4 Southern Noticed Alternative (Route 1B - yellow)

Route 1B (See yellow route in Figure 4-12) does not score as well as other southern options and is more costly (ranked no. 6 for cost) compared to other routes, though it is selected as the Noticed Alternative as it is the best scoring route that avoids both the construction/design issues with using the I-91 ROW associated with Route 1A and avoids impacts to Forest Park and potential for Article 97 issues associated with Route 1.

4.7 Conclusion and Selection of Overall Preferred and Noticed Alternative Routes

Eversource evaluated a range of geographically diverse routes to develop a Preferred Route, variations to the Preferred Route and a Noticed Alternative. To allow for assessment of the overall Project Preferred Route and overall Noticed Alternative in Section 5, Eversource has combined the best scoring route in the south with the best scoring route in the north (Southern Preferred Route with the Northern Preferred Route) and combined the Southern Noticed Alterative with the Northern Noticed Alternative (see Figures 4-12 and 4-13).

The overall Preferred Route scored the best in the routing assessment with respect to minimizing environmental and human use impacts and has the second lowest cost. In addition to the Preferred Route, Eversource included two variations to the Preferred Route to explore the potential use of Williams Street in the south (Route 2) and the opportunity to directly cross Forest Park (Route 1). These routes scored third and first with respect to cost, respectively. The Noticed Alternative, which scores worse than the Preferred Route and its variations and has a higher cost, has the advantage in that it provides for a route that avoids the MassDOT highway layout and constructability issues associated with the siting along I-91 on the Preferred Route, and avoids Article 97 permitting and environmental issues associated with crossing of Forest Park (Variation No. 2 to Preferred Route). The Noticed Alternative also has the highest degree of geographic diversity of the top-scoring routes.

Based on this analysis, the following routes were advanced for further evaluation in Section 5 (see Figure 4-13).

- Route 1A Preferred Route (green).
- Route 2 Variation No. 1 to Preferred Route (blue)
- Route 1 Variation No. 2 to Preferred Route (orange)
- Route 1B Noticed Alternative (yellow)

5.0 EVALUATION OF PREFERRED ROUTE NOTICED VARIATIONS TO PREFERRED ROUTE AND THE NOTICED ALTERNATIVE ROUTE

This section describes the environmental impacts and proposed mitigation measures associated with the Preferred Route, the Noticed Variations to the Preferred Route and the Noticed Alternative Route, and the appurtenant facilities.

5.1 Route Description

Descriptions of the Preferred Route, Noticed Variations to the Preferred Route, and the Noticed Alternative Route are provided below.

5.1.1 Preferred Route

The proposed 16-inch new steel main line will be constructed within and adjacent to existing roadway easements. The Preferred Route begins in Longmeadow at the proposed Longmeadow POD off Hazardville Road. The route then extends north along Shaker Road, continues north to Converse Street where it turns west and runs along a residential area to Longmeadow Street (Route 5). The Preferred Route then follows Longmeadow Street north through a residential area, along Columbus Avenue (Route 5) to an interchange at I-91, along the west boundary of Forest Park. The Preferred Route exits the interchange eastbound along Longhill Street, which curves northbound at North Magawiska Road. The new 16-inch pipeline installation continues into Springfield.

From this location, the Preferred Route follows Route 83 and Longhill Street northbound. At the northern terminus of Longhill Street, the Preferred Route follows Hall of Fame Avenue north, paralleling I-91 to its terminus at the Bliss Street Regulator Station.

A total of 2.97 miles of the Preferred Route are in the Town of Longmeadow. Land use along roads used for the Preferred Route in the Town of Longmeadow consist primarily of single-family residential land, recreation land (i.e., Longmeadow Country Club), and tax-exempt land (i.e., conservation areas, Longmeadow Town Green, and Laurel Park).

A total of 2.29 miles of the Preferred Route are in the City of Springfield. Land use along roads used for the Preferred Route in the City of Springfield consist primarily of single- and multi-family residential land, and commercial land.

5.1.2 Noticed Variation of Preferred Route – No. 1 (referred to herein as the Williams Street Variation)

The Noticed Variation of Preferred Route – No. 1 (referred to herein as the Williams Street Variation) follows the description of the Preferred Route in Section 5.1.1 from the proposed POD north to Williams Street. The Williams Street Variation extends west along Williams Street to Longmeadow Street. The Route then follows the description of the Preferred Route in Section 5.1.1 above, to the Bliss Street Regulator Station.

A total of 2.89 miles of the Williams Street Variation is in the Town of Longmeadow. Land use along roads used for his route consists primarily of single-family residential land, recreation land (i.e., Longmeadow Country Club), and tax-exempt land (i.e., conservation areas, Longmeadow Town Green, and Laurel Park).

A total of 2.29 miles of the route is in the City of Springfield and land use in the City of Springfield consists primarily of single- and multi-family residential land, open space land (i.e., Forest Park), and commercial land.

5.1.3 Noticed Variation of Preferred Route - No. 2 (Referred to herein as the Forest Park Variation)

The Notice Variation of the Preferred Route – No. 2 (referred to herein as the Forest Park Variation) begins in Longmeadow at the proposed POD off Hazardville Road. The route then extends north along Shaker Road, crosses Williams Street, and continues north along Laurel Street to Forest Glen Road. The route then extends west along Forest Glen Road to South Magawiska Road. The new 16-inch pipeline installation terminates at the intersection of Forest Glen Road and South Magawiska Road.

A total of 2.51 miles of this route is in the Town of Longmeadow. Land use along roadways consists primarily of single family - residential land, recreation land (i.e., Longmeadow Country Club), and open space land (i.e., Laurel and Bliss Parks).

A total of 2.30 miles of the route are in the City of Springfield. Land use along roadways used by the route in Springfield consists primarily of single- and multi-family residential land, open space land (i.e., Forest Park), and commercial land. The southern portion of Forest Park where the route extends is referred to as South Magawiska Road on street maps, but in actuality this is a park walking path and hence the portion of the pipeline that travels along this pathway would be along open space and park land.

5.1.4 Noticed Alternative Route

The Noticed Alternative Route extends from the POD north along Shaker Road, which bisects the Longmeadow Country Club. Once past the Country Club, the Noticed Alternative Route continues to follow Shaker Road and Laurel Street through a residential area, bisects Laurel and Bliss Parks and then crosses another residential area from the northern boundary of Laurel Park to Converse Street. The Noticed Alternative Route extends northeast along Converse Street to Dickenson Street, then extends north along Dickenson Street until Cliftwood Street, then extends southwest and turns northwest along Cliftwood Street to Sumner Avenue, then extends southwest along Sumner Avenue to Longhill Street and then extends south to intersection of Longhill Street and North Magawiska Road. The remainder of the route follows Longhill Street and East Columbus Avenue north, then turns west on Bliss Street, and South along Hall of Fame Avenue to the Bliss Street Regulator Station.

A total of 3.17 miles of the Noticed Alternative Route is in the Town of Longmeadow. Land use along roadways used by the Noticed Alternative Route in the Town of Longmeadow consists primarily of single and multi-family - residential land, recreation land (i.e., Longmeadow Country Club), and tax-exempt land (i.e., Laurel and Bliss Parks).

A total of 3.22 miles of the Noticed Alternative Route is in the City of Springfield. Land use along roadways used by the Noticed Alternative Route in the City of Springfield consists primarily of single- and multi-family residential land, and commercial land.

5.2 Construction Methods and Overview of Mitigation

Construction of the Project will be performed via the conventional open-cut trenching method. Construction methodology including special crossing techniques, dewatering, laydown/staging, equipment and refueling, and cleanup and restoration, is described in the sections below.

5.2.1 Construction Sequence

5.2.1.1 Establishment of Controls and Worksite Preparation

Existing utilities will be marked and erosion and sedimentation control measures will be set up prior to the start of construction. As agreed upon with the municipalities, measures called for by traffic details (i.e., barrels, warning signs, police details) will be put in place.

Once the work area is prepared, the trench location will be marked on the pavement. As necessary, pavement will be saw-cut and removed for off-site recycling or proper disposal. Where the trench passes near utility poles, the poles and lines will be temporarily supported as needed.

5.2.1.2 Trenching for New Pipe Installation

New pipeline for the Project will be installed using the drag-section and/or stove-pipe methods, which are used to reduce the amount of workspace needed for construction and the duration and length of open pipeline trench. For the drag-section method, several sections of pipe are prefabricated, the trench is dug to accommodate only the length of the drag section, and the prefabricated pipeline segments are placed into the trench and backfilled. For the stove-pipe method, one short section of trench is dug, a section of pipe is laid in the trench and welded into place, and that section of the trench is backfilled. The trenching operation will be limited to the length that can be completed in one day to eliminate unnecessary environmental impacts.

A trench will be excavated by a backhoe or excavator to the proper depth to allow for the burial of the pipe. In general, the footprint for trench excavation will typically be 24-36 inches wide by four to five feet deep, although deeper burial may be required in specific areas (e.g., existing utility crossings).

Soil Stockpiling

Due to the location of the Project along existing roadways, most excavated soils will be hauled by truck. Where space is available, excavated soils will be stockpiled immediately adjacent to the open trench.

Welding

Eversource's welding procedures will be utilized on this Project. All welding will be performed in accordance with all applicable state and federal codes as well as industry standards. In addition, all welds will be radioactive (x-ray) inspected. If any unacceptable flaws are detected, that portion of the weld will be repaired in accordance with the applicable weld standard.

Cathodic Protection

The new coated-steel pipeline will be protected from corrosion in three ways: (1) the pipeline will be shipped to the Project area with a protective exterior coating, which is applied after the manufacturing process; (2) a similar coating (tape, shrink sleeves or a field-applied coating) will be applied to all field welds during construction; and (3) cathodic protective devices will be installed within the footprint of the construction workspace.

Backfill and Compaction

All suitable material excavated during trenching will be redeposited back into the trench. Where excavated material is unsuitable for backfilling, additional clean fill may be required. At a minimum, a bed of clean sand will be laid inside the trench below and around the pipe. This material may be obtained from commercial borrow areas in the region. Once the pipe and sand are installed, the trench will be backfilled with suitable excavated subsoil material. Backfilling will be completed by methods that provide desired compaction and in accordance with requirements of local governmental authorities. Openings in traffic areas of streets, alleys, and road berms shall be compacted in accordance with Eversource standards and local approvals. Any excess soil will be trucked offsite to a pre-approved disposal facility or smoothed in an upland location along the cleared easement.

Pavement Restoration

Where the trench location requires cutting of pavement, pavement restoration will be carried out in accordance with the permit requirements of Longmeadow, Springfield and MassDOT, where applicable. Generally, pavement excavations will be repaired with same-day permanent patches. In general, the length of new excavation completed each day will equal the length of pipeline installed, backfilled, and compacted. In some cases, depending on traffic and other roadway factors, a small work zone at the end of the pipe may be left unfilled and covered with a steel road plate so that the end of the pipe can be located the next day without re-excavating the area. Steel plates will be marked with drums and yellow flashers, if needed, until pavement patching is accomplished. Openings in the shoulder will be protected and barricaded to ensure traffic and pedestrian safety.

Shoulder Repair and Side Slope Revegetation

The shoulder will be graded to its pre-construction contours, with slight mounding to allow for settlement. Any disturbed vegetated areas will be loamed and seeded to match pre-existing vegetation. Any lawn-edge that has been affected by the pipeline will be hand-dressed, seeded, and mulched.

Final Inspection and Alignment Marking

The alignment will be checked by a supervisor to ensure the area is properly restored. Alignment markings will be installed at intervals to indicate the presence of the newly installed pipeline. The newly installed pipeline will also be marked with pipe markers on each side of a road crossing.

5.2.1.3 In-Street Construction Detailed Procedures

Construction within and across public and private roadways using the conventional open cut method will be based on site conditions and any applicable road opening permit requirements.

Roadway opening permits will be sought from Longmeadow and Springfield. Permit conditions of any such permits will determine the day-to-day construction activities at road crossings. Prior to construction, the "Dig Safe" system, or state or local utility operators, will be contacted so they can mark their facilities that may intersect, or be near, the proposed pipeline. The contractor may be required to expose the utilities prior to construction to confirm their location and ensure proper clearances.

Construction will be scheduled for work within roadways and specific crossings to minimize impacts to commuter traffic. Appropriate traffic management and signage will be implemented, and necessary safety measures will be developed in compliance with applicable permits for work in the public roadway. Arrangements will be made with local officials to have traffic safety personnel police details or qualified and trained flaggers available during periods of construction. Provisions will be made for detours or otherwise to permit traffic flow, if needed.

The first step is to install the proper traffic control devices. Traffic will be detoured around the open trench during the installation process. The pipeline crossing is installed one lane at a time. As the pipe is installed, successive lanes are alternately taken out of service for pipe installation until the crossing is completed. If required by local permits, traffic will be detoured around the work area to nearby roadways.

Pavement over the proposed trench will be cut, removed, and disposed of properly. The trench is excavated using a combination of a backhoe and hand shoveling around existing utilities once the ditch is completed and the pipe is installed (welded, inspected, and coated). If required, a vacuum truck will be used, but only if excavation is not feasible with the use of a machine or shovel. All existing utilities exposed during excavation will be supported at their existing elevation to avoid damage. Support will be maintained until backfill of the pipeline ditch and the exposed utility are completed. The trench is then backfilled according to permit specifications. If the roadway surface was paved, the paving will be restored in accordance with the permit requirements.

5.2.1.4 Wetland and Waterbody Crossings

Wetlands

Due to the primarily in-street construction associated with the Preferred Route, the Noticed Alternative Route, and the Noticed Variations to the Preferred Route, none of the routes is anticipated to cross wetlands (see Figure 4-6). Where wetlands are located adjacent to the construction ROW, Eversource will minimize the extent and time that construction equipment operates adjacent to wetland areas. Additionally, to minimize the potential for off-site transport of soils disturbed by the Project, Eversource will install erosion and sediment controls in accordance with its BMPs, where soil disturbance occurs in the vicinity of adjacent wetlands.

Waterbodies

To minimize potential impacts on streams, Eversource will install the pipeline within roadways without disturbing existing culverts. Eversource will take care to ensure that any saturated material excavated from the trench will be properly stored and disposed of as to not cause sedimentation issues and will implement dewatering methodologies, as required. Additionally, to minimize the potential for off-site transport of soils disturbed by the Project, Eversource will install erosion and sediment controls in accordance with its BMPs, where soil disturbance occurs in the vicinity of adjacent waterbodies.

5.2.1.5 Dewatering

Dewatering of the trench will be necessary in areas where groundwater is encountered, where soils are saturated, or at times when the trench is affected by stormwater. The need for dewatering is anticipated in areas where the route crosses wetlands and streams. Typical erosion control practices will be employed to minimize erosion during trenching operations and construction activities.

Dewatering methods will be based on site-specific conditions. Likely dewatering methods will include overland flow and the use of a filter bag within a straw bale containment area placed in a well-vegetated upland location. Overland flow may be used if a discharge location is available where there is no potential for discharged water to flow overland into wetlands or waterbodies. Water may be discharged overland without any filtering to well-drained, vegetated upland areas that allow for natural infiltration into soils. Holding tanks may also be used for dewatering where workspace is constrained due to in-street construction and/or existing residential and commercial development.

Eversource will use a combination of filter bags and a straw bale containment area for dewatering when there is the potential for discharged water to flow overland into wetlands or waterbodies. Potential dewatering sites will be in well-vegetated areas within the easement or approved work areas. Discharges will be located outside of wetlands and over 100 feet from a streambank or waterbody, if practicable. Trench water or other forms of turbid water will not be directly discharged onto exposed soil or into any wetland or waterbody.

5.2.1.6 Laydown and Staging

Eversource is in the process of identifying potential Project laydown or staging areas. Laydown areas will be reviewed during the permitting stages of the Project and will be located outside of any jurisdictional wetland resource area or buffer zone where possible. Should laydown areas need to be sited within resource areas or associated buffer zones, the Company will obtain the necessary authorizations to permit laydown and staging in these areas.

5.2.1.7 Construction Equipment Refueling

All storage and refueling of vehicles and other equipment will occur outside of and as far away as practical from sensitive areas such as wetlands and streams. The minimum distance from wetland areas for storage of fuel and refueling is 100 feet, unless site-specific approval has been obtained. Equipment will be checked regularly for evidence of leakage. Construction material storage will also be located at least 100 feet from wetlands, where possible. If equipment cannot be feasibly located at least 100 feet from wetlands, Eversource will refuel in place using appropriate secondary containment measures. Eversource will also ensure that the Contractor has sufficient spill kits on-site during refueling operations. These and other appropriate measures will be implemented in accordance with a Spill Prevention, Control, and Countermeasure ("SPCC") Plan that will be prepared for the Project.

5.2.1.8 Cleaning and Testing Procedures

Following pipeline installation, pressure testing is required by Federal regulations and Eversource's standards to verify that the pipeline is leak-tight and capable of safely withstanding

its rated pressure. For testing purposes, the line is pressurized in accordance with Company standards and the pipeline segment will be cleaned ("pigged") prior to pressure testing the pipe segment. Then the pipe will be pressure tested with nitrogen and monitored for a period of at least eight hours. The cleaning and testing will be performed in phases as Project segments are completed so they can then be put into service.

5.2.1.9 Horizontal Directional Drilling and Conventional Open Trench Excavation

Horizontal Directional Drilling

Both conventional excavation and HDD construction methods will be evaluated with considerable input and direction from MassDOT. The portion of the work between the Route 5 on-ramp to I-91 and the Longhill Road-Route 83 offramp may require installation via HDD. The potential HDD method involves establishing staging areas along both sides of the proposed crossing at the entry and exit points. The process commences with the boring of a pilot hole into the ground longitudinally beneath I-91 and adjacent ROW and then enlarging the hole with one or more passes of a reamer until the hole is the necessary diameter to facilitate the pull-back (installation) of the pipeline.

Once the reaming passes are completed, prefabricated pipe segments are then pulled through the hole to complete the crossing. While the HDD method is a proven technology, there are certain impacts that could occur as a result of the drilling such as the potential inadvertent release of drilling fluid, which is a slurry of bentonite clay and water which is classified as non-toxic to the aquatic environment and is a non-hazardous substance. There are various measures that are commonly taken to minimize the risk of such a release and mitigation any potential impacts. Most importantly, the Company will conduct significant investigation via geotech work to determine the nature of the soils being drilled. The Company's HDD contractor would use this information to determine the appropriate fluid mix and pressures to be used. Moreover, as the bore is being installed, drilling fluid pressures will be continuously monitored and adjusted. Drilling will stop in the event there is any sudden change to fluid pressures or other indicators that a release as occurred or may be imminent. Additionally, a relief well and/or cases at the entry and exist of the drill operation can be installed to assist in managing the fluid pressures and controlling or averting any potential release. The Company will be developing its design and implementation plans with its HDD contractor, MassDOT and other interested entities.

The HDD process uses bentonite-based drilling fluids. The drilling fluids are tested for specific engineering properties to ensure a successful HDD installation. The environmental impact associated with HDD is the potential for inadvertent release of drilling fluids to the surface along the drill alignment during drilling operations.

The drilling fluids are typically a mixture of fresh water and bentonite (sodium montmorillonite). Bentonite is natural clay usually mined in Wyoming. Bentonite is hydrophilic and can absorb up to ten times its weight in water. Typically, the drilling fluid contains no more than 5 percent bentonite (95 percent fresh water).

The HDD Contractor maintains fluid performance through sampling, testing and recording of the fluid properties during drilling operations; analyzing and then adjusting and maintaining to afford the most efficient drilling fluid rheology to adapt to various geological conditions.

The slurry is designed to:

- Stabilize the bore hole against collapse; stabilizes formations and prevents fluid loss;
- Lubricate, cool, and clean the tooling cutters;
- Cooling for guidance electronics;
- Transport cuttings by suspension to enable flow to the surface at entry/exit points for recycling;
- Produce lubrication for drill string and downhole assembly while drilling which reduces friction forces from the formation and pull loads;
- Produce hydrostatic fluid pressure in the bore hole to offset ground formation/ground water pressure; and
- Drive downhole drill motor for rock drilling.

5.2.1.10 HDD Working Procedures

Additional design, technical evaluations and subsurface investigations are required to validate the feasibility of an HDD installation in I-91 area. Installation options will be vetted and presented to MassDOT for stakeholder input and evaluation. A decision as to the final course of action will be made in partnership with MassDOT to ensure that the construction technique selected is feasible and creates the least disruption to the community and highway operations. Eversource most recently met with MassDOT on April 11, 2022 and discussed the possibility of construction using HDD or open cut installation along I-91 and will continue to coordinate as the Project design advances to determine the optimal construction method in this location.

Prior to drilling operations, site-specific HDD Procedures will be prepared by the HDD contractor. These procedures will be based upon geotech work currently being performed and the likelihood of potential for drilling fluid to leak out of the work area based on geotech data. The general procedures include installation of siltation control measures around the work area, setting up of traffic control and safety measures for work near the on and off ramps and I-91, and placement of the drilling rig at the entry point and then operational work which requires a drilling rig for the boring of holes and then the eventual pulling through of stringed pipe. In this case the hole will be bored near where the Longhill offramp begins at I-91. After the hole is increased to the required size, the pipes will then be pulled back through the hole beginning close the Route 5 on-ramp to I-91 and over to the Longhill Street Route 83 offramp. Work will also be required along the edge of the Route 5 on-ramp to connect the HDD to the southern portion of the pipeline route and along the edge of the Longhill Street Route 83 off-ramp to connect the HDD to the northern portion of the pipeline route.

During construction the pressure of the drilling fluid will be continuously monitored to ensure that if there is a leakage of the fluid, the operator can take the appropriate action. If it is indicated to the driller that annular pressures are abnormally high or fluid loss is apparent and that a release has occurred, the driller will take the following corrective measures or any combination of such:

- Dispatch experienced personnel observers to monitor the area in the vicinity of the drilled path;
- Decrease pump pressure;
- Decrease penetration rate;

- Temporarily cease drilling operations and shut down mud pump;
- Re-start pump and stroke bore hole in 30 ft. +/- lengths to restore circulation ("swab" the hole) as many as 6 times but no fewer than 2 times;
- Introduce additional flow along the borehole starting at the entry/exit using "weeper" subs; and
- Modify the drilling mud with a change in viscosity and/or lost circulation additives.
- A mobile screening and filtration plant will be used to manage recirculation of drilling fluid. Drilling fluid will be pressurized and pumped into the bore, monitored and then recovered at the other end. Once recovered, the fluid will either be screened then pumped back into the bore or it will be recovered and placed into a tanker for transported to an offsite disposal facility.
- A fluid recovery plan will be developed to monitor and recover any inadvertent fluid releases. In the event a release occurs, a vacuum truck will be on site standing by to recover the fluid if necessary. The recovery plan will be reviewed and approved by all necessary stakeholders.

5.2.1.11 HDD Design

The HDD design includes installation of the pipeline to a depth more than 20 feet below an existing culvert that runs beneath the highway. The design is intended to avoid impact to the culvert and achieve a depth whereby preventing the unintentional release of drilling fluid during the HDD operation. The HDD plans, an open-cut assessment and MassDOT related compliance information is provided in Attachment F.

5.2.1.12 Open Cut Trenching

In addition to HDD installation technology, the Company is also exploring the option of conventional pipeline installation with MassDOT. Such conventional installation, also known as open-cut installation, involves the opening of a ditch for the installation of pipe. First, the area is surveyed and a pipeline design is prepared, which includes vertical and horizontal pipeline alignments. Foreign utility crossing depths are identified and researched to determine how the crossing will be conducted. For pipeline installation under hard surfaces such as concrete or asphalt, the surface is sawcut along the route. For soft surface installation, surface material such as grass or topsoil is removed. Then, an excavator prepares the ditch to a suitable depth for the pipeline installation. The pipeline is prepared at a nearby staging area by welding joints together and preparing offsets and bends. Then, the fabricated pipeline section is transported to the open ditch and lowered in. The weld joints are coated to prevent corrosion and the coating is electrically tested to identify any flaws in the pipeline coating, which are repaired if needed. A protective layer of sand, known as a sand pad, is filled around the pipe. And backfill material is layered into the trench and properly compacted. Warning tape is applied along the pipeline route to identify the gas pipeline below. Measurements are taken and recorded into the Company's records. Finally, the soft surface and/or hard surface is restored to like-new condition.

5.2.2 Construction Impacts and Mitigation

5.2.2.1 Soil Management

Eversource's objective is to minimize the potential for erosion and sedimentation impact during pipeline construction with the following measures:

- Minimize the quantity and duration of soil exposure;
- Protect areas of critical concern during construction by redirecting and reducing the velocity of runoff;
- Properly install, maintain, and inspect erosion and sediment control measures during construction; and
- Re-establish vegetation where required as soon as possible following final grading.

Erosion and sedimentation control management measures will be installed and properly maintained by Eversource's construction contractor to reduce erosion and retain sediment on site during and after construction. These devices can prevent erosion, collecting sediment (suspended and floating materials), and filtering fine sediment. Sediments collected by these devices will be removed and placed in an upland location beyond buffer zones and any other regulatory setbacks preventing later migration into a waterway or wetland. Once work has been completed, all areas shall be stabilized with erosion control blankets and/or robust vegetation and erosion control devices shall then be removed.

Eversource's contractor will install and maintain erosion and sediment control measures during construction. Eversource's environmental inspector will provide oversight of the contractor's activities. The sections below describe the expected erosion and sediment control techniques that will be used during construction.

Temporary Sediment Control Barriers

Temporary sediment control barriers will be installed prior to initial disturbance of soil and maintained throughout construction until final stabilization is achieved. Measures may include, but not be limited to, straw bales, silt fence, jute matting, and straw wattles. Straw bales will be placed, as needed, to form a temporary sedimentation control barrier to slow flow velocity and trap sediments to prevent siltation in sensitive areas, specifically downgradient areas with open and/or flowing water.

Silt fence is constructed of a permeable geotextile fabric secured by wooden stakes driven into the ground. It is installed as a temporary barrier to prevent sediments from flowing into an unprotected and/or sensitive area from a disturbed site. Any silt fence used as a construction-period control will be installed as directed by manufacturer specifications and applicable permit conditions. Silt fence will be installed downgradient of the work area. Accumulated sediment will be removed and the fence inspected to ensure it remains embedded in the soil as directed. Once the Project is complete and soils are stabilized, silt fence materials (i.e., geotextile fabric and wooden stakes) will be removed and properly disposed off-site. Sufficient silt fence will be stockpiled on-site for emergency use and maintenance.

Straw wattles are used as a sediment control device to slow runoff velocities, entrain suspended sediments, and promote vegetation growth until an area is stabilized. The wattles are constructed from a biodegradable netting sock stuffed with straw and may be left to biodegrade in place once construction is complete. They are not generally intended for steep slopes, but rather, to stabilize low to moderate grades where there is a broad area of disturbance. Straw wattles may also be used along small stream banks to protect areas before vegetation has stabilized the soils.
Temporary sediment control barriers will be installed as described below

- At the outlet of a slope break when existing vegetation is not adequate to control erosion;
- Downslope of any stockpiled soil in the vicinity of waterbodies and vegetated wetlands;
- At sideslope and downslope boundaries of the construction area where runoff is not otherwise directed by a slope break;
- Maintained throughout construction and will remain in place until permanent revegetation has been judged successful, upon which they will be removed;
- At boundaries between wetlands and adjacent disturbed upland areas;
- As necessary to prevent siltation of ponds, wetlands, or other waterbodies adjacent to/downslope of the Project;
- At the edge of the construction area as needed to contain soil and sediment; and
- Catch basins along the work area will be protected using silt sacks and perimeter straw bales. The silt sacks and hay bales will be installed before pavement removal and trench excavation begins and will remain in place until the area is repaired and the shoulder repaved and revegetated.

Mulching

Mulching is not expected to be required since work will be done in streets, except for the work area around the entry and exit holes of the HDD work. If areas off the streets are disturbed via equipment parking or operating there, mulching and/or reseeding will take place. Application rates and technique depend on the material used. Mulch material will be based on soil type, site conditions, and the season. Straw provides the densest cover if applied at the appropriate rate (at least ½ inch) and will be mechanically or chemically secured to the soil surface. Woodchip application in upland areas is also possible if on-site materials are available for use.

Temporary and Permanent Diversions

Temporary and permanent diversions are ridges or channels constructed across steep slopes that convey the runoff to a stable outlet at a non-erosive velocity. These will be used as permanent diversions on slopes with high runoff velocities to break up concentrated flow. They can be installed as temporary diversion and completed as permanent when the site is stabilized or can be installed in the final form initially.

5.2.2.2 Restoration

The workspace corridor will be restored to pre-construction grade, seeded, and mulched to provide vegetative stabilization of all disturbed areas. The following BMPs will be used to stabilize and restore vegetation to the easement, where applicable.

Seeding and Mulching

The seedbed in disturbed areas will be prepared to a depth of three (3) to four (4) inches to provide a firm seedbed. Disturbed areas will be seeded in accordance with Eversource's specifications (seed mixes, rates and dates) and permit conditions. Seeded areas will then be mulched with straw.

Slope Stabilization and Restoration

Erosion control blankets are generally composed of biodegradable or synthetic materials and are used as a temporary or permanent aid in the stabilization of disturbed soil on slopes. These blankets are used to prevent erosion, stabilize soils, and protect seeds from foragers while vegetation is recolonized.

Temporary and Permanent Trench Breakers

Trench breakers (trench plugs) are temporary or permanent measures used to slow the movement of groundwater and surface runoff within a trench. They are often used when runoff draining to downgradient work areas causes problems within the trench. Trench breakers may be placed adjacent to waterways and wetlands to prevent water from seeping into work areas or disrupting the hydrology of the resource areas. They can be used on slopes throughout all types of land uses (including agricultural and residential). Trench breakers are installed upslope of each permanent slope breaker or water bar.

Remove Erosion Control Devices

Following final site stabilization, all temporary erosion and sediment control devices will be removed from the construction workspace in accordance with permit requirements. Controls which are biodegradable (i.e., straw wattles) may be cut and spread over disturbed areas to facilitate further revegetation.

5.2.2.3 Environmental Inspections

Eversource will employ a qualified environmental inspector to ensure that construction activities follow the requirements of federal, state, and local permits and approvals. Inspections will occur at least once per week or more frequently as warranted.

5.2.2.4 Air Quality

Construction of the Project will result in a minor, temporary increase in emissions of some pollutants from the use of equipment powered by diesel fuel or gasoline engines. Construction activities may also result in the temporary generation of fugitive dust associated with disturbance of the ground surface and other dust generating actions. There may also be some temporary indirect emissions attributable to construction workers commuting to and from work sites during construction.

During construction, Eversource will make best efforts to use ultra-low sulfur diesel in construction equipment and utilize non-road engines either retrofitted with best available technology or certified to meet U.S. Environmental Protection Agency's ("USEPA's") Tier IV Exhaust Emissions Standards without the need for additional retrofitting. Best available technology for reducing emissions of particulate matter ("PM"), hydrocarbons, and/or carbon monoxide ("CO") from non-

road engines may include diesel retrofit devices specifically named on either the USEPA Verified Technology List or the California Air Resources Board Verified Technology List, such as diesel particulate filters, diesel oxidation catalysts, or catalyzed wire mesh filters. Eversource will also limit the idling of engines to a maximum of five minutes whenever the construction equipment is not in use. In addition, construction equipment will be properly tuned, and operated only on an as-needed basis to minimize the combustion emissions from diesel and gasoline engines.

Fugitive dust emissions from construction activities will depend on such factors as the properties of the emitting surfaces (i.e., moisture content and volume of spoils), meteorological variables, and construction practices employed. Although fugitive dust may be generated during construction activities, the relatively small disturbance area for this Project makes it unlikely that the migration of dust will cause off-site impacts. Furthermore, soil excavation does not typically generate dust because of the natural moisture content of subsurface soils. Nonetheless, the contractor will implement dust control measures as needed during active construction that will primarily consist of street sweeping and using wetting agents to control and suppress dust. Additionally, a Stormwater Pollution Prevention Plan ("SWPPP") will be developed for this Project, which will include BMPs for minimizing fugitive dust. In summary, air quality impacts will be minor, temporary and localized and once the work is completed the Project will have no impact on air quality.

5.2.2.5 Construction Work Hours

Typical daily construction hours will extend is expected to be from 7:00 a.m. to 4:00 p.m., Monday through Friday in Springfield and 7:30 to 3:00 pm in Longmeadow. Actual work hours may vary and are subject to approval by the respective permitting authority. When needed, extended construction hours will be coordinated with Longmeadow, Springfield and MassDOT. To minimize traffic impacts from closure of Route 5 on-ramp onto I-91 during HDD construction, the HDD construction may occur during nighttime hours.

5.2.2.6 Construction Equipment

The construction vehicles and equipment that may be anticipated to complete the Project include in general order of work: crew truck, concrete industrial saw, an excavator, hydraulic rock breaker, vacuum truck, skid steer loader/front end loader, welding truck and welder, cranes, trailers, side booms, handheld tooling, generators, pumps compressor (for air testing), dump truck, and track asphalt paver. For the HDD work, there is also directional drilling machinery required.

5.3 Environmental/Resource Area Constraints and Mitigation

5.3.1 Wetland and Stream Crossings

Eversource conducted a survey of the Preferred Route, Preferred Route Variations, and the Noticed Alternative and determined that wetlands and streams along the Preferred Route were predominantly consistent with the mapped MassDEP wetlands. Eversource also conducted an in the field wetlands investigation at the location of the HDD work on the Preferred Route and the Williams Street Variation since the entry and exit points are located off roadways and in the MassDOT vegetated ROW. Due to the primarily in-street construction and no wetlands impacts off the streets in the area of the HDD, none of the routes cross MassDEP wetlands (see Figure 4-6). Wetlands are located adjacent to the routes in some locations (e.g., wetlands are adjacent to the Preferred Route along Shaker Road and Dickenson Street, adjacent to Williams Street

Variation along Shaker Road and Columbus Avenue, adjacent to the Forest Park Variation along Shaker Road and South Magawiska Street, and adjacent to the Noticed Alternative Route along Shaker Road and Columbus Avenue.

The Preferred Route crosses three MassDEP streams: Longmeadow Brook in the same location as the Noticed Alternative, Cooley Brook (along Laurel Street), and Pecousic Brook (along I-91).

The Williams Street Variation crosses four MassDEP streams: Longmeadow Brook, Wheel Meadow Brook, Cooley Brook, and Pecousic Brook). The Forest Park Variation crosses three MassDEP streams: Longmeadow Brook, Cooley Brook, and Pecousic Brook.

The Noticed Alternative Route crosses four MassDEP streams: Longmeadow Brook (associated with the Longmeadow Country Club), Cooley Brook (associated with Laurel Park), Entry Dingle Brook (associated with Forest Park), and Pecousic Brook (associated with Forest Park).

At stream crossing locations, Eversource will install the pipeline within roadways beneath or above existing culverts depending on depth of culvert and infrastructure constraints. The work will use open trench or trenchless construction techniques. Eversource will take care to ensure that any saturated material excavated from the trench or bore pits be properly stored and disposed of as to not cause sedimentation issues and would implement dewatering methodologies, as required. In the case of the HDD crossing of Pecousic Brook, the work will be more than 20 feet below the culverted crossing and will have no impact on the culverted stream.

Based on the proposed in-street construction proposed, implementation of erosion and sediment controls, and as the referenced culverted streams will not be affected, the Preferred Route, Noticed Variations to the Preferred Route and the Noticed Alternative Route are comparable with respect to wetland and stream impacts.

5.3.2 Protected Habitats

According to MassGIS NHESP data, there are no Priority Habitats of Rare Species or Estimated Habitats of Rare Wildlife mapped within or adjacent to the Preferred Route, Noticed Variations to the Preferred Route, or the Noticed Alternative Route (see Figure 4-7). The closest Priority Habitat is associated with the Connecticut River to the west of the Project Study Area (PH 2064).

There are also no Certified or Potential Vernal Pools within the footprint of or adjacent to the Preferred Route, the Forest Park Variation or Noticed Alternative Route. There is one Potential Vernal Pool (PVP 23549) located adjacent to Longmeadow Street / Route 5 (approximately 50 feet from the edge of the road) along the Williams Street Variation. Although the Williams Street Variation is within 50 feet of a potential vernal pool, Eversource will implement in-street construction and erosion and sediment controls in the vicinity of this resource. As the work is entirely in the street, no impacts on the potential vernal pools are expected to occur.

Based on the in-street construction and lack of protected habitats, vernal pools and potential vernal pools occurring near the alternative routes, the Preferred Route, Noticed Variations to the Preferred Route, and the Noticed Alternative Route are comparable with respect to protected habitats, and vernal pool impacts.

5.3.3 Tree Clearing

Due to the primarily in-street construction associated with the Preferred Route, Variations to the Preferred Route and the Noticed Alternative Route, no permanent tree clearing is anticipated along any routes for installation of the new pipeline. With respect to construction of the HDD crossing for the Preferred Route and the Williams Street Variation, an area of trees in the middle of the I-91 ROW between the Route 5 on-ramp and Route 5 off ramp, approximately 0.35 acres in size, will have to be temporarily cleared to allow for stringing/staging of the HDD work process. After construction, this area of trees will be re-planted (if desired by DOT) and thus no long-term tree clearing will occur.

Due to the primarily in-street construction associated with the Preferred Route, Variations to the Preferred Route and the Noticed Alternative Route, no permanent tree clearing is anticipated along any routes for installation of the new pipeline. The Preferred Route and Williams Street Variation will have temporary tree clearing impacts associated with HDD that the other routes do not, but longer term all the routes will have no impacts overall on tree cover.

5.3.4 Recreational, Open Space, and Article 97 Lands

The Preferred Route passes by four open space lands: the Longmeadow Country Club, the Town of Longmeadow Laurel Park and Bliss Park, Forest Park/Forest Park Extension (see Figure 4-8). The Williams Street Variation passes six open space lands including the Longmeadow Country Club, Longmeadow Cemetery, Longmeadow Town Green, the Town of Longmeadow Wheelmeadow Brook Conservation Area, Town of Longmeadow Laurel Park, and the City of Springfield Forest Park.

The Forest Park Variation passes by four open space parcels: the Longmeadow Country Club, the Town of Longmeadow Laurel Park and Bliss Park, and the City of Springfield Forest Park (see Figure 4-8).

The Noticed Alternative Route passes by four open space lands including the Longmeadow Country Club, Laurel Park, Bliss Park, and the City of Springfield Forest Park.

Construction in public roadways near the above referenced parks is only expected to result in minor temporary impacts associated with construction (e.g., noise, dust and traffic impacts). Soil disturbance and clearing outside of the existing roadways near or adjacent to open space parcels is not anticipated, and construction will not result in permanent impacts to the open space properties.

The only route that passes through a park and which is not entirely in a public roadway is the Forest Park Variation. This route follows along a walking path in the southern end of Forest Park (referred to as South Magawiska Road on street maps) and then transitions to a park vehicle roadway (e.g., North Magawiska Road) through the remainder of the north portion of the park. The associated construction work in the park may affect public access during construction period and cause noise, dust and other limited construction impacts that may temporarily affect use and enjoyment of the park. Although wetlands are adjacent to the southern portion of the route in the park, the work will be done entirely on the upland path/road and installation of sedimentation control barriers will avoid impact to these wetlands.

For purposes of its evaluation, the Company has treated Forest Park as subject to Article 97 jurisdiction. Article 97 lands have been acquired for conservation purposes and are protected

under Article 97 of the Amendments to the Massachusetts Constitution, the Public Lands Protection Act. Use of the Route Variation to Preferred Route – No. 2 will cause a significant delay in the Project due to time required to obtain the Article 97 authorization via an act of the Legislature. Of note is that, although the Preferred Route and the Williams Street Variation also cross through Forest Park, they do so on a heavily traveled roadway (e.g., the Route 5 on-ramp to I-91) and will not have the use impacts and Article 97 filing requirements of the Variation to Preferred Route No. 2.

Table 5-1 below identifies the open space lands in the vicinity of the Preferred Route, the Noticed Alternative Route, and the Noticed Variations to the Preferred Route.

Table 5-1: Open Space Properties in the Vicinity of the Preferred Route, the Noticed Alternative Route, and Noticed Variations to the Preferred Route

Open Space Parcel	Article 97 Land (Yes / No)	Preferred Route	Noticed Alternative	Variation to Preferred Route – No. 1 (Williams Street Variation)	Variation to Preferred Route – No. 2 Forest Park Variation
Longmeadow Country Club	No	X	X	X	X
Longmeadow Cemetery	No			X	
Longmeadow Town Green	Yes			X	
Wheelmeadow Brook Conservation Area	Yes			X	
Laurel Park	No	X	X	X	X
Bliss Park	No	X	X		X
Forest Park and Forest Park Extension	Yes	X	X	X	**X***
Total Number of Areas		**4**	**4**	**6**	**4**

*Noticed Variation to Preferred Route – No. 2 crosses Forest Park on paths and non-public roads and is the only route alternative subject to Article 97 jurisdiction.

In conclusion, the Preferred Alternative, the Forest Park Variation and Noticed Alternative route pass adjacent to four parks whereas the Williams Street Variation passes adjacent to six parks. However, with respect to direct impacts to open space and parkland, the Forest Park Variation has the most impacts as it crosses a portion of Forest Park on a foot path and has direct construction impacts to recreational land uses in the park (e.g., noise, dust, temporary closure of park road) and is subject to Article 97.

5.4 Human Constraints and Mitigation

5.4.1 Land Use

Based on review of MassGIS 2016 Land Cover / Land Use data (May 2019), land use within 100-feet of the Preferred Route and the Noticed Alternative Route includes a mix of commercial, industrial, mixed use, open, recreation, single and multi-family residential, ROW, and tax-exempt lands (see Figure 5-1 and Table 5-2, below).

Land use within 100-feet of the Preferred Route is primarily ROW (64 percent), open land (12 percent), and single-family residential (10) (see Figure 5-1). Some commercial parcels are in Longmeadow off Longmeadow Street / Route 5 along the Preferred Route; however; most commercial land (5 percent) and multi-family land (3 percent) are north of Forest Park in Springfield.

Approximately 55 percent of the land use within 100 feet of the Noticed Alternative is ROW (i.e., roadway ROWs). Approximately 16 percent of the land within 100 feet of the Noticed Alternative Route is single-family residential, and approximately 5 percent of the land within 100 feet of the Noticed Alternative Route is open land. Residential land is located adjacent to the streets used by the Noticed Alternative Route in Longmeadow and Springfield, interspersed with open space parcels. Multi-family residential land (7 percent) is located along Longhill Street and East Columbus Avenue in the City of Springfield. Commercial land (7 percent) along streets used by the Noticed Alternative Route is in the City of Springfield near the Project terminus along East Columbus Avenue. Commercial development in the area consists of car dealerships, car rental agencies, food services, gas stations, and other retail businesses.

Land use within 100 feet of the Williams Street Variation is primarily ROW (53 percent), open land (12 percent), and single-family residential (18 percent) (see Figure 5-1). Land use within 100 feet of the Forest Park Variation is primarily ROW (57 percent), open land (12 percent), and single-family residential (15) (see Figure 5-1).

Temporary construction impacts to residences, businesses and sensitive receptors may include traffic disruption, road closings, noise, and/or dust. However, the buried pipeline once installed within the area roadways will not permanently change the current land use on or adjacent to the area roadways. Eversource will restore the Project construction area to pre-construction conditions following the completion of pipe installation.

Based on the land use information in Table 5-1, the Noticed Alternative effects the greatest number of acres of residential and commercial uses, other land use designations and overall land use impacts (primarily because of its longer length). Based on this, the Preferred Route and Noticed Variations to the Preferred Route have less construction-related land use impacts than the Noticed Alternative. Once installed, there will be no land use impacts from the Project.

5.4.2 Sensitive Receptors

Sensitive receptors located within the Study Area include schools (pre-K through high school), colleges and universities, long-term care residences, and community health centers. The Preferred Route avoids sensitive receptors in Longmeadow (see Figure 4-9) and passes by one in Springfield (Sumner Avenue School). Three sensitive receptors were identified on parcels

abutting the Noticed Alternative Route (Heritage Academy, Forest Park Middle School, and Sumner Avenue School) (see Figure 4-9). The Williams Street Variation passes by three sensitive receptors: Bay Path University, Saint Mary's Academy, and Sumner Avenue School. The Forest Park Variation passes by one sensitive receptor: Sumner Avenue School.

Users of these facilities could be temporarily affected by construction noise and dust, and disruption to local traffic. The Preferred Route, Noticed Variations to the Preferred Route and the Noticed Alternative Route could impact daily commutes to these locations. Eversource will manage in-street construction to maintain full access for emergency, ambulance and/or fire service.

Given the lack of sensitive receptors in proximity to the Preferred Route and the Forest Park Variation) (just one sensitive receptor for each of these routes), these routes are superior for minimizing sensitive receptor impacts compared to the Williams Street Variation and Noticed Alternative (3 sensitive receptors each).

5.4.3 Public Transportation

Review of PVTA bus route maps (PVTA, 2020) identified public transportation routes along streets used by the Preferred Route, the variations to the Preferred Route and the Noticed Alternative Route include routes G1, G5, The Loop, and R14. The G1 route is in the City of Springfield and the Noticed Alternative Route follows the G1 route along Sumner Avenue from Cliftwood Street to Fort Pleasant Avenue. The G5 route runs from just south of the Connecticut State border, north into the Town of Longmeadow along Longmeadow Street / Route 5. The G5 route follows along Longmeadow Street north before extending east along Converse Street, crossing Laurel Street, and extending along Converse Street east to Dickenson Street, and then extending north along Dickenson Street. The Loop bus route includes a loop that heads south on Hall of Fame Avenue (Formerly West Columbus Ave) north on East Columbus Ave, and then extends north on Main Street beyond the study area. The R14 bus route is mostly located in Agawam, but crosses over the Memorial Avenue Bridge into Springfield, follows Boland Ave east, then Dwight Street north and ends at Liberty Street in Springfield.

Table 5-2: Land Use Within 100 Feet								
Land Use Type	**Noticed Alternative**		**Preferred Route**		**Noticed Variation to the Preferred Route No. 1 (Williams Street Variation)**		**Noticed Variation to the Preferred Route No. 2 (Forest Park Route)**	
	Acres	**Percent of Total**	**Acres**	**Percent of Total**	**Acres**	**Percent of Total**	**Acres**	**Percent of Total**
Commercial	12.77	7	7.11	5	7.01	6	7.07	5
Industrial	0.25	<1	0.59	<1	0.25	<1	0.25	<1
Mixed Use, other	0.39	<1	0.15	<1	0.15	<1	0.15	<1
Mixed Use, primarily residential	2.79	2	0.15	<1	0.15	<1	0.15	<1
Open Land	9.00	5	15.89	12	14.78	12	15.99	12
Recreation	5.29	3	5.29	4	5.29	4	5.29	4
Residential – multi-family	11.68	7	3.88	3	3.99	3	4.17	3
Residential – single family	27.22	16	13.75	10	21.42	18	20.35	15
ROW	95.46	55	87.17	64	64.59	53	75.02	57
Tax Exempt	10.16	6	2.48	2	3.86	3	3.86	3
Unknown	0.10	<1	0.46	<1	0.11	<1	0.13	<1
Total	**175.11**	**100**	**136.93**	**100**	**121.61**	**100**	**132.43**	**100**
Source: MassGIS 2016 Land Use / Land Cover (May 2019)								

Locations of Bus Routes Relative to Preferred Route, Variations to the Preferred Route and Noticed Alternative are described below:

- The Preferred Route follows the Loop bus route along Hall of Fame Avenue in the northern portion of the gas pipeline route (see Figure 5-2).
- The Williams Street Variation follows the G5 route along Longmeadow Street from Williams Street north to Converse Street (see Figure 5-2). This variation also follows the Loop bus route along Hall of Fame Avenue in the northern portion of the gas pipeline route (see Figure 5-2).
- The Forest Park Variation follows the Loop bus Route along Hall of Fame Avenue in the northern portion of the gas pipeline route (see Figure 5-2).
- The Noticed Alternative Route follows the G5 bus route east along Converse Street from Laurel Street to Dickenson Street and then north along Dickenson Street. It also follows the G1 bus Route on Sumner Avenue between Beaumont and Longhill Street. Finally, the Noticed Alternative Route also follows the Loop bus route along East Columbus Avenue at the northern end of the gas route (see Figure 5-2).

Potential impacts to public transportation users from new pipeline construction within streets used for bus routes include temporary disturbance from construction-related noise or increased traffic congestion because of in-street work. Construction of either route is not anticipated to result in significant long-term traffic disruption to busses along the routes. Eversource will work with the PVTA and Longmeadow and Springfield officials to develop adequate traffic control management measures to ensure impacts are minimized, where applicable.

The Noticed Alternative Route follows bus routes for a longer distance than the other routes, due to its collocation with the G1 and G5 routes along Sumner Avenue, Dickenson Street, and Converse Street. As such, the Noticed Alternative Route has the greatest potential to impact public transportation. Although traffic measures will be put in place to minimize disruptions, there is a higher level of potential impact to public transportation users from the Noticed Alternative Route because of the longer-term construction duration to install the new 16-inch pipe within Converse Street, Dickenson Street, and Sumner Avenue.

Based on this review, the Preferred Route and Noticed Variations to the Preferred Route are superior to the Noticed Alternative with respect to public transportation, though any such impacts will only exist during construction and will be minimized via a traffic management plan.

5.4.4 Subsurface Contamination

A review of MassGIS data for AUL sites, Chapter 21E sites, Underground Storage Tanks ("USTs"), and Active, Inactive, and Closed Landfills was performed to determine the potential to encounter subsurface contamination along the Preferred Route, the Noticed Variations to the Preferred Route and the Noticed Alternative Route.

For all the routes, no Chapter 21E sites or landfills were identified along them. Based on the review, four AUL sites were identified along the Preferred Route and the Noticed Variations, and seven AUL sites identified along the Preferred Route (see Figure 4-10). Thus, with respect to adjacent AUL sites, the Noticed Alternative Route and Noticed Variations have a slight advantage over the Preferred Route.

With respect to USTs along the routes, the Noticed Alternative Route had six, the Preferred Route had five, and the Noticed Variations to the Preferred Route had four. Thus, in terms of Adjacent

USTs, the Noticed Variations to the Preferred Route have a slight advantage over the Preferred Route and the Noticed Alternative Route.

The Preferred Route, the Noticed Variations to the Preferred Route and the Noticed Alternative Route, are not expected to contribute to any subsurface contamination or disturb any known release sites. However, given that Preferred Route, the Noticed Variations to the Preferred Routes and the Noticed Alternative Route are routed within area roadways there is a chance of encountering undocumented releases and historic/urban fill (non-native fill that may contain coal, ash, brick, concrete, etc.) along both routes.

In the event contaminated soils or groundwater are encountered during construction, the soils and/or groundwater will be managed pursuant to the Utility Related Abatement Measure ("URAM") provisions of the Massachusetts Contingency Plan ("MCP") (310 CMR 40.0000). Eversource will utilize its soil and groundwater management plan and will contract with a Licensed Site Professional as necessitated by conditions encountered along the Project route, consistent with the requirements of the MCP (310 C.M.R. 40.0460).

Based on a summation of the AUL and UST data above, the Preferred Route and the Forest Park Variation have the fewest spills in total, eight, versus ten for the Noticed Alternative and twelve for the Williams Street Variation.

5.4.5 Historic Resources

This section provides a review of the Project's potential impacts to historic resources. Known historic architectural properties within the vicinity (i.e., approximately 100-feet) of the Preferred Route, Noticed Variations, and Noticed Alternative Route, and were evaluated through review of the MACRIS Maps data layer available through MassGIS. This public data layer consists of points and polygons representing information from the MACRIS database and related records on file at the Massachusetts Historical Commission ("MHC"), including the Inventory of Historic Assets of the Commonwealth, NRHP nomination forms, LHD study reports, local landmark reports, and other materials (MassGIS, 2020). The following inventory points were included in the review: NRHP), Preservation Restriction, Massachusetts Historic Landmark, LHD, and NRHP and LHD. No Massachusetts Historic Landmarks were identified in the Project Study Area through this review.

Springfield and Longmeadow were established in 1636 as part of an expedition up the Connecticut River to establish a trading post and Puritan "plantation", and Springfield was officially incorporated as a city in May of 1852. Both municipalities experienced early settlement and continued growth as populated centers of trade, industry, and local government. As such both municipalities have many NRHP and LHD registered structures, and both have established LHDs.

Based on review of the MHC inventory data, the Preferred Route is located in the vicinity of 33 historic points, the Williams Street Variation is in the vicinity of 41 historic points, the Forest Park Variation is in the vicinity of 28 historic points, and the Noticed Alternative Route is in the vicinity of 20 historic points.

Included in these points, the Williams Street Variation passes through the Town of Longmeadow Historic District, which includes the Longmeadow Green and surrounding areas, including the Town Hall, and the old section of the cemetery. Additionally, all the routes evaluated in this section pass through a portion of the City of Springfield Longhill Street LHD and the Noticed

Alternative Route passes through the entire Longhill Street LHD (i.e., 124 to 432 Longhill Street) (City of Springfield, 2020c).

Based on review of the MHC inventory data, all the routes pass alongside National Register Properties and or LHDs, with the Notice Alternative passing along the fewest of the sites. These areas will experience noise, dust and traffic associated with construction, but once constructed there will be no operational impacts.

5.4.6 Visual Impacts and Mitigation

With respect to the pipeline portion of the Project, the Preferred Route, the Noticed Variations to the Preferred Route and the Alternative Route will be located underground within existing roadways. The roads used for the route pass through primarily residential, open space, and commercial areas. Visual impacts will be related to construction only, and no long-term permanent changes in the existing land use is proposed. There are no Massachusetts Scenic Byways or MassGIS Scenic Landscape Inventory areas in the vicinity of the routes.

Construction of the Preferred Route, the Noticed Variations to the Preferred Route and the Noticed Alternative will include temporary disturbance within existing roadway ROWs to facilitate construction. Given that the new pipeline will be installed underground, there will be no permanent visual impacts from the pipe. However, construction of the pipeline facilities will require in-street work in the vicinity of residences and parks. Accordingly, construction vehicles and equipment will be visible from residences and parks temporarily during construction. Eversource will work with individual property owners to address visual concerns on a case-by-case basis. Once construction is complete, the roadways will be restored in accordance with Eversource's specifications, landowner agreements and permit conditions.

With respect to the POD, this will involve a series of low-profile utility buildings within an area of other utility buildings used to support Longmeadow Country Club operations. As the POD is common to the development of all the routes, it does not factor into the impact rating of the different routes. A full visual assessment of the POD is provided in Section 5.9.2.7, which evaluates Appurtenant facilities.

Since the Preferred Route, the Noticed Variations to the Preferred Route and the Noticed Alternative Route are located underground and within roadway ROWs, and all primarily along residential and open space properties, the routes are comparable with respect to visual impacts.

5.4.7 Noise Impacts and Mitigation

Existing noise sources in the Study Area include vehicular traffic on local roads, activity at commercial properties, typical noise associated with residential neighborhoods, occasional aircraft, birds and insects.

Pipeline construction activity and associated noise levels for the Preferred Route, the Noticed Variations to the Preferred Route and the Noticed Alternative will vary depending on the phase of construction in progress at any one time. Construction activities related to the Project will consist generally of the following noise-producing activities;

- Selective tree removal where necessary;

- Trench excavation;
- Welding;
- Backfill and compaction;
- Final pavement restoration; and
- Trucking of material to and from the site.

Each of these activities may be conducted simultaneously at each location. The highest level of construction noise is assumed to occur during earth work (i.e., trench excavation and backfilling). This phase will involve the operation of excavators and may include activities such as rock hammering. Back-up alarms are required for this equipment for safety purposes.

The potential for noise impacts from construction is a function of the specific receptors along the route as well as the equipment used and proposed hours of operation. Construction is anticipated to occur during typical work hours (7:30 a.m. to 4:30 p.m.), though in specific instances at some locations, or at the request of the municipality, the Project may seek municipal approval to work at night. Nighttime work will be minimized and performed only on an as-needed basis, such as when crossing a busy road, and will be coordinated with each municipality. Following the pipeline installation, when performing the pressure test and when gassing into service, work will continue through the night; however, no significant noise contribution is expected.

Project construction will generate noise levels that are periodically audible along the Project routes. Proposed construction equipment will be like that used during typical public works projects (i.e., road resurfacing, storm sewer installation, transmission line installation).

In general, the sound levels from construction activities will be dominated by the loudest piece of equipment operating at the time. Therefore, at any given point along the work area, the loudest piece of equipment will be the most representative of the expected sound levels in that area. Maximum sound levels from typical equipment proposed during construction are listed in Table 5-3 at a reference distance of 50 feet.

Table 5-3: Reference Sound Levels of Construction Equipment at 50 Feet[27]

Equipment	Max. Sound Level (dBA) at 50 Feet[1]
Mobile Crane (manhole installation)	85
Pavement Saw (trench excavation)	90
Asphalt Paver (street restoration)	85
Pneumatic Hammer (trench excavation)	85
Mounted Impact Hammer (hoe ram) (trench excavation if ledge)	90
Backhoe (trench excavation)	80
Dump Truck (trench excavation)	84

[27] Thalheimer, E., "Construction Noise Control Program and Mitigation Strategy at the Central Artery/Tunnel Project", Noise Control Eng. Journal 48 (5), 2000 Sep-Oct.

Pipeline construction noise-related impacts from the Preferred Route, the Noticed Alternative Route, and the Noticed Alternative Route Variations are expected to be short in duration at any given location and, therefore, have minimal impact. Construction equipment noise levels will typically be less than 85 dBA at 50 feet when equipment is operating at full load. However, construction equipment is generally not operated continuously at maximum load, with significant variation in power and usage. Actual received sound levels will fluctuate, depending on the construction activity, equipment type, and separation distances between source and receiver. Other factors, such as terrain and obstacles such as buildings will act to further limit the impact of construction noise levels. People at nearby residences and buildings will hear the construction noise but the overall impact will be short-lived. Construction will not result in the generation of, or exposure of persons to, excessive noise or vibration levels for lengthy periods.

The Town of Longmeadow has a general by-law (Chapter 400 of the Town of Longmeadow By-Laws, Public Order and Decency, Section 6-407, updated through 2019) that regulates construction activities. According to the by-law, the operation of a bulldozer, power shovel, roller, or other heavy equipment after the hour of 9:00 p.m. and before the hour of 7:00 a.m. is considered unreasonably loud, disturbing, or unnecessary and is not allowed. Additionally, the Town of Longmeadow has a Zoning By-Law (Article XV. Restrictions for facilities of Natural Gas Utilities) that establishes noise limits for natural gas related facilities including compressor, gate, metering, pigging, and valve stations. Chapter 259 of the City of Springfield Code includes Noise provisions. Construction hours are restricted to 7:00 a.m. to 7:00 p.m. on weekdays, except in the interest of public safety or welfare, by permit, for emergency work, or other special exception.

Overall, the Preferred Route, the Noticed Variations to the Preferred Route, and the Noticed Alternative Route will utilize similar equipment and construction techniques (except for the need to use HDD on the Preferred Route and the Williams Street Variation to be discussed further below). The Noticed Alternative Route passes in proximity (100-feet) to 1,403 residential units or parcels along streets used by the route, while the Preferred Route passes within proximity to 393 residential units or parcels. The Williams Street Variation passes within proximity to 442 residential units or parcels and the Forest Park Variation passes within proximity to 408 residential units or parcels. The noise impacts stemming from construction of the Noticed Alternative Route will be more widespread because construction activities will occur over a wider swath of the community because of the longer length of new pipeline installation. Therefore, the area of overall potential noise impact is greater for the Noticed Alternative when compared to the Preferred Route and its variations.

While intermittent increases in noise levels are expected during construction activities, Eversource is committed to minimize these impacts. Because of the temporary nature of the construction noise during normal installation of the pipeline along the pipeline route, no adverse or long-term effects are anticipated.

Construction noise, while varying according to equipment in use, will be mitigated by the attenuating effect of distance and the intermittent and short-lived character of the noise. Further, the nature of construction of a pipeline dictates that construction activities and associated noise levels will move along the corridor and that no single location will be exposed to significant noise levels for an extended period. Some discrete activities (e.g., pressure testing, tie-ins, purge and packing the pipeline, etc.) may require 24-hour activity for limited periods of time (e.g., from one to three days). However, these 24-hour activities will require only a few overnight construction personnel and will not result in significant noise generation. Eversource's contractor will implement standard industry practices to for minimizing noise from construction vehicles and equipment during construction. Additionally, blasting will not be conducted as part of this Project

due to the proximity to existing residences and underground utilities, nor is construction expected to result in noticeable vibrations.

Although the Preferred Route, the Noticed Variations to the Preferred Route, and the Noticed Alternative Route will all impact the area with noise during construction, the Noticed Alternative Route will affect a broader area of residential and open space / park users with construction noise because of its longer length of new pipeline installation.

5.4.8 Horizontal Directional Drilling

The Preferred Route and the Williams Street Variation both include the potential requirement for the use of HDD to install the pipeline longitudinally along I-91 between the Route 5 on-ramp and the Longhill Street Route 83 off-ramp. Conventional excavation is also being evaluated with MassDOT. In the event, that HDD work is required, a drilling rig and supporting equipment will be mobilized for the boring of holes and then the eventual pulling through of stringed pipe. In this case the hole will be bored near where the Longhill offramp begins at I-91. The noise levels from HDD work are typically 85 dBA at 50 feet. Using this metric, estimated noise levels at the closest receptors (park facility 200 feet to the east, and closest residence 558 feet to the north, there will be an increase above ambient noise level of 8.4 dBA and 2.5 dBA, respectively at these two locations. These noise increases will be below the 10 dBA increase allowed by MassDEP per 310 CMR 7.10. The HDD work is proposed to take place at night to minimize traffic impacts (see Section 5.4.9) and as such, the park and park facility will be closed, and no noise impacts are expected there. Regarding the nearest residence, the 2.5 dBA increase is below the level of noise increase typically audible (3 dBA) and as such, is not expected to impact the nearest residence (see noise reports in Attachment G). Once constructed, there will be no noise impacts from operation of the pipeline at this location.

In conclusion, the Preferred Route, the Noticed Variations to the Preferred Route, and the Noticed Alternative Route will all impact the area with noise during construction. However, the Noticed Alternative Route will affect a broader residential area and open space / park users with construction noise because of its significantly longer length of new pipeline installation. The potential HDD will result in noise as well, but is limited in its impact, and not expected to affect persons living in the area.

5.4.9 Traffic

The construction work associated with the Project will affect traffic since the pipeline will be constructed in city streets. Portions of streets will need to be closed on a short-term basis to allow for room for construction equipment and trenching operations, installation of the pipe, backfilling and re-paving. Impacts to traffic are expected to be greater on the Preferred Route compared to the Forest Park Variation because of the much higher volume of traffic on the Route 5 on-ramp to I-91, Route I-91 itself, and the Route 83 off-ramp, compared to Forest Park, where South Magawiska Road has not traffic at all (e.g., walking path) and the north portion of the park has very little traffic volume on North Magawiska Road.

5.4.9.1 Traffic Impacts and Mitigation Associated with In-Street Work

To minimize traffic delays at open-cut road crossings for the Preferred Route, Noticed Variations to the Preferred Route and the Noticed Alternative, Eversource will establish detours before cutting along the roads. If no reasonable detours are feasible, at least one traffic lane of the road

will remain open, except for brief periods when road closure will be required to lay the pipeline. Appropriate traffic management and signage will be established, and necessary safety measures will be developed in compliance with applicable permits for work in public roadways. Arrangements will be made with local officials to have traffic safety personnel on-hand during periods of construction. Provisions will be made for detours, or otherwise, to permit traffic flow. Eversource is committed to working with both municipalities to address potential transportation-related impacts associated with constructing the proposed pipeline.

The movement of construction equipment and materials and daily commuting of employees to and from the construction work areas may also slightly increase traffic volumes in specific areas. However, this limited increase in local traffic is anticipated to be minor with no impact to the local transportation system within the Project area. Several construction-related trips will be made each day (to and from the job site). This level of traffic will remain consistent throughout the construction period and will typically occur during the early morning and evening hours. To minimize traffic congestion, Eversource will encourage construction workers to share rides or take public transportation to the construction site. Contractors may also provide buses to move workers from common parking areas to the construction work area.

Pipeline construction work is typically scheduled to take advantage of daylight hours (see Section 5.2.2.5). Some discrete activities (e.g., pressure testing, tie-ins, purge and placing the new facility into service etc.) or road crossings where specifically required by the town and or permits may occur beyond these time frames. Given that construction will move sequentially along the pipeline easement, traffic flow impacts that do arise will be temporary on any given section of roadway.

To maintain safe conditions, Eversource will require construction contractors to comply with vehicle weight restrictions and limitations and to remove any soil deposited on road surfaces from crossing construction equipment. Mats or other appropriate measures (e.g., sweeping) will be used, when necessary, to reduce mud deposition from equipment crossing roadways.

5.4.9.2 Traffic Impacts and Mitigation Associated with HDD Work

To minimize impacts associated with Preferred Route and Williams Street Variation where they pass within I-91 ROW, it may be feasible for Eversource to use HDD to avoid many direct impacts to the surface of I-91 and its on and off ramps. Instead of in-road work, a bore hole will be horizontally directional drilled from a location off the highway, under the highway longitudinally between the Route 5 on-ramp and the Route 83 off-ramp and the gas pipeline will be pulled through the bore hole. To accomplish the work, the Route 5 on-ramp will need to be closed for approximately 1 to 3 weeks to allow for required workspace to string the pipelines together before they are pulled back through the HDD hole. As well, open trenching will be required along the shoulder of the onramp to join the HDD with the portion of the pipeline to the south and along the shoulder of the offramp to join up with the HDD with the portion of the pipeline to the north. Further evaluation and design work is required with MassDOT to determine the best feasible solution. Conventional excavation may be required in the event that an HDD is determined to be too difficult or impactful. In either case, and to minimize traffic impacts, Eversource proposes work during night-time hours as necessary to avoid the high-volume traffic period and will develop detour routes as needed. Eversource will provide appropriate signage and safety measure to warn drivers of the work taking place in the area and coordinate with the towns and MassDOT to inform motorists and minimize impacts.

5.4.9.3 Comparison of Traffic Impacts for Different Routes

The evaluation method for traffic impacts is discussed in Section 4.5.7.8. In general work on streets with lower volumes of traffic (e.g., feeder roads that support neighborhood traffic) will have less traffic impacts than on streets with high volumes of traffic (e.g., collector roads, or minor and major arterial roads), while taking into account the length of the route along each type of roadway. In this case the Noticed Alternative is substantially longer than the other routes (e.g., more than 2 miles longer than the Preferred Route and Noticed Variations to the Preferred Route and it extends through densely settled areas of Longmeadow and Springfield. As such, it will have temporary and localized impacts for a longer period than the other routes.

However, both the Preferred Route and Williams Street Variation, while substantially shorter than the Noticed Alternative Route do require a lengthy detour around the work area to account for the need to close the Route 5 on-ramp traffic to I-91. This detour although relatively short in duration compared to the entire project (1 to 3 weeks), and although mitigated (nighttime work only), will have traffic impacts. With respect to the Forest Park Variation, the road work in Forest Park will likely require the closing of North and South Magawiska Roads within the park, which will affect traffic and access within the park and could cause issues with parking and vehicle flow.

The above-mentioned routes will result in traffic for different reasons (e.g., traffic impacts along the much longer route for Noticed Variation versus traffic impacts from need for detour associated with HDD on Preferred Route and Williams Street Variation). The Forest Park Variations both the shortest route and does not require HDD but has will also result in park related traffic issues. While all alternatives will affect traffic, Eversource's proposed construction and traffic management described herein will minimize such disruptions. Moreover, all traffic impacts will be temporary, and once constructed, none of the routes will impact traffic during operation of the facility.

5.5 Comparison of Environmental Impacts

The Preferred Route, Noticed Variations to the Preferred Route, and the Noticed Alternative Route are comparable in terms of avoiding environmental impacts (e.g., no impacts to wetlands, streams, tree clearing, and rare species). The Noticed Alternative and the Williams Street Variation have substantially more impacts with respect to Sensitive Receptors, Public Transportation, and Subsurface Contamination than the Preferred Route and Forest Park Variation.

The Preferred Route and Forest Park Variation have the least environmental impact with the key distinction between them being that the Preferred Route does not directly impact Article 97 lands and Forest Park, while the Forest Park Variation does impact this area. Thus, the Preferred Route is superior to the Forest Park Variation with respect to environmental impacts.

Table 5-4: Summary Comparison of Preferred Route, Noticed Variations to Preferred Route and Noticed Alternative - Environmental Criteria				
Evaluation Criteria	**Preferred Route**	**Noticed Variation to Preferred Route- No. 1 (William St Variation)**	**Noticed Variation to Preferred Route Variation No. 2 Forest Park Variation**	**Noticed Alternative Route**
Wetland and Stream Crossings	=	=	=	=
Wetlands and Streams	=	=	=	=
Protected Habitats	=	=	=	=
Tree Clearing	=	=	=	=
Article 97 Lands Crossed	=	=	-	=
Article 97 & open space adjacent	=	=	-	-
Sensitive Receptors	=	-	=	-
Public Transportation	=	-	=	-
Subsurface Contamination	=	-	=	-
Historic Resources	=	-	=	+
Visual Impacts	=	=	=	=
Noise Impacts	=	=	=	-
Traffic Impacts	=	=	=	=
The sites were scored as follows: superior (+), inferior (-), and equal to each other (=).				

Table 5-4 shows that the Preferred Route has no inferior (-) scores whereas the Williams Street Variation, the Forest Park Variation and the Noticed Alternative have four, two, and five inferior scores, respectively. Specifically, the William Street Variation has inferior scores for sensitive receptors, public transportation, subsurface contamination, and historic resources, the Forest Park Variation has inferior scores for Article 97 lands crossed and areas adjacent to Article 97 and open Space, and the Noticed Alternative has inferior scores for areas adjacent to Article 97 and open space, public transportation, subsurface contamination, and noise impacts. Based on this information, the Preferred Route is superior to the other routes since it has less environmental and human use impacts.

5.6 Comparison of Reliability

All the pipeline routes will provide a safe and reliable gas supply and are comparable with respect to reliability.

5.7 Comparison of Cost

As described previously in Section 4.4.3, generally the longer the route the higher the cost and there are added costs for HDD work. The Forest Park Variation is the shortest route and has no HDD and has the lowest cost. This is followed in order of increasing cost by the Preferred Route, Williams Street Variation, and the Noticed Alternative (see Section 4.5.10.3, Table 4-7).

Table 5-5: Summary of Costs

Route	Length (miles)	Route Cost (millions)	HDD Cost (millions)	Total Cost (millions)
Preferred Route (I-91)	5.26	$59.1	$1.0	$60.1
Forest Park Variation	4.81	$54.1	0	$54.1
Williams Street Variation	5.45	$61.2	$1.0	$62.2
Noticed Alternative Route	7.2	$80.85	0	$80.85

5.8 Conclusion

The Preferred Route, Variations to the Preferred Route and Noticed Alternative Route are comparable in terms of avoiding impacts to wetlands, streams, and rare species. However, the Preferred Route is the best route for minimizing environmental impacts to human uses and thus the best overall for environmental considerations. Specifically, the Preferred Route is superior to the William Street Variation with respect to minimizing impacts to sensitive receptors, public transportation, subsurface contamination, and historic resources and is superior to the Forest Park Variation as it does not cross Article 97 lands or is situated adjacent to Article 97 land or open space. Finally, the Preferred Route is superior to the Noticed Alternative in that it does not cross adjacent to article 97 lands or open space, and minimizes impacts to public transportation, subsurface contamination, and noise impacts. With respect to reliability, all routes are equivalent and will provide a safe reliable source of gas. With respect to cost, the Forest Park Variation is the shortest route and has no HDD and thus is the lowest cost alternative. This is followed in order of increasing cost by the Preferred Route, Williams Street Variation, and the Noticed Alternative. Thus, the Preferred Route does not have the lowest overall cost but is the second lowest-cost option. The Siting Board is not required to select the lowest cost option but must balance differences in cost against reliability benefits and environmental impacts. In this instance, the Preferred Route is superior with respect to the human environment and weighs in favor of selection of that route. Given the above information and balancing of the environmental impacts with considerations of reliability and cost, the Preferred Route is the superior route as it provides a reliable source of gas while minimizing environmental impacts and cost.

5.9 Appurtenant Facilities

The appurtenant facilities are common to all the alternatives and described below along with their environmental impacts. Some of the facilities will be owned and operated by TGP and have been permitted.

5.9.1 Longmeadow Point of Delivery

The proposed Longmeadow POD is located on Hazardville Road, in Longmeadow and will serve as the POD for gas from the TGP existing 200-1 and 200-2 pipelines to the Company's distribution system (see Figure 1-2). The POD is on the southeastern side of the Longmeadow Country Club and includes an approximately 1.4-acre site. The site consists of a paved drive off Hazardville Road in the area of the Club's paddle courts and maintenance buildings and adjacent wooded area.

5.9.2 TGP and Eversource Ownership

TGP and Eversource each will own and manage portions of the POD based on their agreement to use this location as the POD for the Project. TGP's portion of the POD will be constructed under its blanket construction certificate issued by the FERC[28] and via MEPA EOEA Certificate 15879. Eversource's portion of the Project requires MEPA review and approval by the Siting Board. For completeness, a description of TGP's portion of the Project is also included. A summary of the facilities owned and operated by each company is listed below:

Those facilities owned and operated by Eversource, and part of this Siting Board petition and analysis, include:

- Pressure regulations facilities to be in a 28-foot by 50-foot regulator building;
- Instruments and controls to be in an instrument and control ("I&C") building;
- Gas odorizer injection facilities to be in a 16-foot by 32-foot building;
- Gas heating facilities to be in a 20-foot by 20-foot boiler building;
- Power generator for backup power supply; and
- Interconnect piping and associated valving from TGP's meter building to CMA's facilities.

Other facilities to be owned and operated by TGP, to be constructed under its FERC blanket construction certificate, include:

- Instruments and controls to be in a Remote Terminal Unit ("RTU") Building;
- Two new 8-inch taps on TGP's existing 200-1 and 200-2 Lines;
- Filter separator;

[28] EEA No. 15879, Certificate of the Secretary of Energy and Environmental Affairs on the Final Environmental Impact Report, Tennessee Gas Pipeline 261 Upgrade Projects, Agawam and Longmeadow, August 2, 2019. Available at https://eeaonline.eea.state.ma.us/EEA/emepa/

- One new 4-inch and one new 8-inch meter to be in a 25-foot by 50-foot meter building;
- Interconnect piping from the taps to the filter separator and meter building and associated valving; and
- An improved driveway from Hazardville Road to be used as access.

The environmental impacts associated with the Eversource facilities at the POD are described below.

5.9.2.1 Wetlands and Floodplain

As part of its evaluation of potential environmental impacts and mitigation, Eversource surveyed the entire POD site using a professional wetlands scientist and determined that no wetlands, vernal pools or floodplains exist on site.

Based on the results of the Company's wetland survey, the POD will not impact wetlands, vernal pools, or floodplains.

5.9.2.2 Rare Species

No state mapped estimated habitat of endangered species or priority habit exist on site. TGP submitted a description of the POD as well as TGP's proposed conservation measures to the U.S. Fish and Wildlife Services ("USFWS") on December 6, 2018 demonstrating that the POD will not result in adverse impacts to the northern long-eared bat, which is mapped state-wide in Massachusetts. On January 29, 2019, the USFWS issued a determination that the proposed POD may affect, but is not likely to adversely affect, the northern long-eared bat.

Based on the response from USFWS, the proposed POD is not likely to adversely affect rare species.

5.9.2.3 Cultural Resources

MHC has concurred that the construction of the POD will have no effect on known historic properties located within or immediately adjacent to the POD's APE, including the Longmeadow Country Club. If previously unidentified cultural resources or human remains are discovered during ground-disturbing activities, an Unanticipated Discoveries Plan will be implemented, which outlines the steps that must be taken in the event of the discovery of previously unknown cultural resources or human remains during construction of the Project.

Based on the results of the cultural resources surveys conducted, the proposed POD will have no permanent direct or indirect effects on historic properties.

5.9.2.4 Land Use

The primary impacts to existing land use from the proposed POD will be the clearing of open woodland / upland forest for construction of the proposed facilities. The combined total of approximately 0.98 acres will be utilized for construction workspace and access. Upon completion of construction, the POD's new operational impact (outside TGP's existing pipeline easements) will be 0.53 acres for the new permanent facility and permanent access roads. Land

used as temporary construction workspace only will revert to pre-construction condition. See Table 5-6 below:

Table 5-6: Land Use Acreage Affected by Construction and Operation of the POD

Workspace Type	Developed Land		Undeveloped Land / Upland Forest)		Total	
	Const.	Oper.	Const.	Oper.	Const.	Oper.
Meter Station and Tap	0.14	0	0.56	0.33	0.70	0.33
Additional Temporary Workspace	0.08	0	0	0	0.08	0
Access Roads	0.16	0.16	0.04	0.04	0.20	0.20
Meter Station Project Total:	0.38	0.16	0.60	0.37	0.98	0.53

Land use impacts are minimal (0.53 acres) and the projects land use is consistent with the surrounding parking lot/maintenance operations for the Country Club. As such land use impacts will be minor.

5.9.2.5 Emission Impacts

During the construction period, GHG emissions will be emitted from diesel-fired non-road construction equipment and diesel and gasoline-fired on-road construction and commuter vehicles. Interconnections of the POD will use hot tap methodology which allows a new connection to be made to the main line without the need to release natural gas (methane). GHG emissions associated with construction are from construction and commuter vehicle internal combustion engines. Emissions of GHGs are typically expressed in terms of carbon dioxide equivalent ("CO2e"), where the potential of each gas to increase heating in the atmosphere is expressed as a multiple of the heating potential of carbon dioxide, or its global warming potential. Construction of the meter station is expected to result in 25 tons per year ("TPY") of GHG emissions related to construction equipment and 0.01 tons related to purging of gas during commissioning. Construction of the gas pipeline is expected to result in approximately 790 tons of CO2 emissions associated with the construction equipment.

The gas heater for the boiler will generate a small amount of GHG emissions, equivalent to approximately 2.3 metric tons of CO_2 per year, which is well below the MassDEP's GHG reporting threshold of 5,000 TPY per 310 CMR 7.71. Fugitive emissions will be associated with piping components and there will be minimal vented emissions associated with portions of the POD, please see Table 5-5.

Non-routine GHG emissions may occur during maintenance procedures which are generally once every five to seven years for the filter separator and once every three to five years for the low flow meter. Venting for the filter separator maintenance will occur when the filter barrel is depressurized prior to being opened and the low flow meter will be calibrated using a third-party

attachment which may vent to the atmosphere. During operations the facility is expected to result in 72.47 TPY of GHG emissions as a result of facility venting (0.05 TPY) and fugitive emissions (72.42 TPY).

GHG emissions in Massachusetts are reported pursuant to two rules, the USEPA's Mandatory Reporting Rule, codified under 40 C.F.R. Part 98, and MassDEP's Greenhouse Gas Emissions Reporting Rule at 310 CMR 7.71. The POD will not be subject to Subpart W (Oil and Natural Gas Systems) of the USEPA rule and 310 C.M.R. 7.71(5)(a)2.) for state level GHG reporting. S subpart W covers equipment leaks from piping components, but only requires monitoring and reporting if an applicable source emits greater than actual emissions of 25,000 metric tons of GHGs. GHG emissions from the POD will be below this threshold.

GHG emissions are reported in Massachusetts pursuant to MassDEP's rule at 310 CMR 7.71, based on CO2e. Under this rule, facilities with GHG emissions of more than 5,000 TPY are required to report. GHG emissions from the POD Project are below this threshold.

The POD will result in short-term (lasting only for the duration of the construction period), localized effects on air quality during construction, primarily from fugitive dust from land disturbance during construction activities and combustion emissions associated with the operation of the construction equipment. No federal or state air permits are required for these temporary air emissions.

Fugitive emissions will be associated with piping components and there will be vented emissions associated with portions of the POD. Non-routine venting is expected to be infrequent and associated with maintenance activities. Operational air emissions will include VOCs and GHGs. The estimated annual emissions for the operation of the POD are summarized in Table 5-7.

Table 5-7: Emissions Per Year

SOURCE	EMISSIONS (TPY)	
	VOC	GHG
Venting	<0.001	0.05
Fugitive Components	0.016	72.42
Gas Heated Boiler	-	2.3
Total	0.016	74.77

Based on the POD emissions, there are no anticipated significant long-term effects on air quality. The POD does not require any air plan approvals from MassDEP. Air quality impacts from the POD are minimal.

5.9.2.6 Noise Impacts

Construction Noise

As discussed above, during construction of the pipeline, there will be short-term, temporary noise impacts associated with construction activities will primarily result from the use of heavy construction equipment and machinery. Noise levels will vary throughout construction depending on the phase of work, number and locations of operating equipment, distance of the noise receptor from the noise source, atmospheric conditions, and any intervening topography or barriers (e.g., walls, buildings, and vegetation). Moreover, any noise impacts associated with pipeline installation will be temporary and limited to the amount of time construction is occurring on a specific portion of the route. Impacts due to construction noise will be temporary and nighttime construction in residential areas is not anticipated for a majority of the route. Limited overnight construction may be required by MassDOT in proximity to I-91 and in association with the HDD operation to mitigate traffic impacts and such impacts will be minimal and in compliance with state noise regulations (see Attachment G).

Construction activities associated with the POD (e.g., ground-disturbing activities, including grading and movement of heavy construction equipment) may generate localized ground borne vibration and noise. Blasting or pile-driving activities are not anticipated but, should they be required during the construction of the POD, TGP will obtain the necessary approvals and adhere to the regulations applicable to controlled blasting and blast vibration limits with regard to structures and underground utilities. Generally, construction-related ground borne vibration is not expected to extend beyond 25 feet from the generating source, and no sensitive receptors are located within 50 feet of areas of construction. As a result, no vibration-related impacts to sensitive receptors, such as local residences or water wells, will occur in association with the POD. Moreover, the Company does not anticipate any nighttime, noise-producing activities in association with construction of the POD.

For standard construction equipment, in addition to the effects of sound attenuation over distance, potential noise impacts will be further minimized by implementation of the following BMPs:

- Restricting construction activities to daylight hours;
- Equipping vehicles and equipment with mufflers; and
- Maintaining vehicles and equipment in accordance with manufacturers' recommendations.

The highest sound levels during construction are expected during the early earthmoving phase. Equipment that may be operating during this phase will include front end loaders, bulldozers, graders, dump trucks, etc.

Operational Noise

A noise study of the meter station was conducted by Eversource to assess operational noise of the facility. The study included measuring of ambient noise levels and modeling of noise levels during the proposed facility operation (see Noise Report at Attachment G). The Company selected the closest residences for assessment, which are located south and southeast of the facility along Hazardville Road and Fairway Drive (see Figure 5-3).

A summary of the acoustical evaluation, including the Project acoustical design goals, the expected Project-generated sound levels with the above sound control measures incorporated, and the expected increases over ambient conditions are shown in the Table 587 below:

Table 5-8: Overall A-weighted Sound Level Results [dB(A)] of Acoustical Evaluation, POD, Longmeadow, Massachusetts.

Location	Minimum Ambient Sound Level	Expected Project Sound Level	Combined Future Generated Sound Levels	
	L90	L90	Ldn	L90
A	38	39	45	42
B	38	44	51	45
C	38	37	43	41
Limit	-	-	55	48

The MassDEP has a noise regulation (310 C.M.R. 7.10), which is part of the Commonwealth's air pollution control regulations. The regulation limits increase in sound due to the POD over the overall minimum measured ambient conditions to no greater than 10 dB(A) at the POD property line and noise sensitive receivers and includes limits for pure tone conditions. In addition, the FERC noise limit of 55 dB(A) Ldn was adopted as a design goal.

The ambient measurement program resulted in a minimum ambient sound level of 38 dB(A) for the POD property line and residences along Fairway Drive and Hazardville Road. Acoustical modeling of the POD sound sources was conducted in order to determine the noise control measures required to achieve the design goal. Chief sources of noise include the Meter Station Building (68.3 dB(A)), the Water Bath Heater Building (91 dB(A)), the Regulator Building (99.6 dB(A)) and a wall fan (85 dB(A)). The modeling results revealed that with the noise control measures incorporated, increases in sound due to POD operation are expected to meet the 55 dB(A) L_{dn} criteria, the 10 dB(A)) L_{90} increase criteria, and the pure tone criteria at the nearest noise sensitive areas. Specifically, the modeling results revealed increases in sound due to POD operation are expected to result in only a maximum noise increase at the nearest residence of 3 dB(A) over the L_{90}.

Based on the results from the noise study, the POD will have a minimal impact on noise and meets the regulation limits to increases in sound.

5.9.2.7 Visual Impacts

The POD is designed to have a low profile and has a detailed landscaping plan that will minimize visual impacts (see Attachment H). During the MHC review of the POD, TGP proposed changes to minimize visual impacts of the facility. Specifically, TGP shifted some of the equipment locations within the POD site footprint and added buildings to be installed over some of the proposed equipment in order to minimize visual impacts to neighboring properties. These added buildings match the façade and design of the buildings shown in the proposed conditions renderings (see Attachment H). The proposed buildings have been designed to be compatible with the country club setting by conforming to the style, scale, and layout of the existing country club buildings.

In addition to enclosing the equipment and providing compatible building architecture, TGP added landscaping along the meter station site footprint (see landscaping plan in Attachment H). Plantings include 70 large 7- to 8-foot high trees to block views (eastern cedar and arborvitae) and understory plantings (mountain laurel, switchgrass, rosebay rhododendron and leatherleaf viburnum). In addition to these trees, the facility already has a substantial natural wooded buffer of mature trees which will shield views of the proposed POD from the golf course as documented via visual simulations in Attachment H.

Conclusions on POD Impacts

The POD has been designed to minimize impacts with respect to noise, visual, land use, wetlands, and air quality. It has been cited in an area with very little environmental resources (e.g., no wetlands, floodplain, threatened and endangered species) and will have a building style and low profile to avoid visual impacts from the street or neighboring properties. The facility has been designed such that its noise levels will be very low and complies with all air emission standards. As a result of this mitigation, once constructed, it will not have an impact on the environment or people living in the area and will provide a safe POD for needed gas to address a gas contingency should it occur.

5.9.3 Modified Bliss Street Regulator Station, Springfield

The Bliss Street Regulator Station in Springfield is an existing station and the terminus of the Project pipeline route (see Figure 1-2). Proposed modifications to the Bliss Street Regulator Station include installing new regulators and tie-in of the new 16-inch steel line. Modifications at the Bliss Street Regulator Station will be located within the existing station property and fence line.

Based on review of MassGIS databases, there are no MassDEP wetlands or streams, no NHESP Priority or Estimated Habitats, no sensitive receptors, no known subsurface contaminants or Chapter 21E regulated sites, and no historic areas in the vicinity of the proposed modifications. Land use in the vicinity of the station is industrial and consists of the railroad to the west, I-91 to the east, and parking lots to then north and south of the station. Riverfront Park is located to the west of the station; however, the railroad corridor is located between the station and the park. Based on the minor scale of the modifications at the existing station and the presence of existing industrial and railroad activity, no impacts on Riverfront Park are anticipated from the proposed modifications.

5.10 Overall Conclusion

Both the selected POD location and Preferred Route minimize human use and environmental impacts. The POD has been designed to minimize impacts with respect to noise, visual, land use, wetlands, and air quality and has been located in an area with few environmental resources (e.g., no wetlands, floodplain, threatened and endangered species) and will have a building style and extensive landscaping that will avoid visual impacts from the street or neighboring properties.

The Preferred Route, Variations to the Preferred Route and Noticed Alternative are comparable in terms of avoiding impacts to wetlands, streams, and rare species. However, the Preferred Route is the best route for minimizing environmental impacts to human uses, specifically sensitive receptors and residences, and is, thus, the best overall for environmental considerations. With respect to reliability, all routes are equivalent and will provide a safe reliable source of gas. With respect to cost, the Forest Park Variation is the shortest route and has no HDD and thus the

lowest cost. This is followed in order of increasing cost by the Preferred Route, Williams Street Variation, and the Noticed Alternative. Given the above information, in balancing environmental impacts with considerations of reliability and cost, the Preferred Route is the superior route as it provides a reliable source of gas while minimizing environmental impacts consistent with costs.

6.0 CONSISTENCY WITH THE CURENT HEALTH, ENVORNMENTAL PROTECTION, AND RESOURCE USE AND DEVELOPMENT POLICIES OF THE COMMONWEALTH

6.1 Introduction

Pursuant to G.L. c. 164, § 69J, the Siting Board shall approve a petition to construct a facility if, inter alia, the Siting Board determines that "plans for expansion and construction of the applicant's new facilities are consistent with current health, environmental protection, and resource use and development polices as adopted by the commonwealth." As discussed below and in more detail throughout this Analysis, the Project not only satisfies the requirements of this statute but is also fully consistent with other important state energy policies as articulated in the Electric Utility Restructuring Act of 1997 (the "Restructuring Act"), the Green Communities Act (c. 169 of the Acts of 2008), the GWSA (c. 298 of the Acts of 2008), the Clean Energy Act (c. 227 of the Acts of 2018), and An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy (c. 8 of the Acts of 2021).

6.2 Health Policies

G.L. c. 164, § 69J requires the Siting Board to review projects to "provide a necessary energy supply for the [C]ommonwealth with a minimum impact on the environment at lowest possible cost." Thus, an adequate and reliable supply of energy has been determined by the Legislature to be critical to the state's citizens public health and welfare as well as essential to a robust economy. The Project will be consistent with this legislatively articulated policy because it will support the existing gas system in Springfield and Longmeadow areas by ensuring reliability to customers at a low cost. Accordingly, the Project will enhance the safety, health and welfare for the Commonwealth's citizens and economy and therefore meet this legislative objective.

Also, the design, construction, and operation of the Project will be in accordance with applicable governmental and industry standards such as the Pipeline Hazardous Materials Safety Administration ("PHMSA"), the Occupational Safety and Health Administration ("OSHA") regulations and the Massachusetts Natural Gas Safety Code (220 C.M.R. 101.00) and will therefore have no adverse health effects. Lastly, the Project will comply with all state and local planning procedures in cases of emergency.

6.3 Environmental Protection Policies

The Project is consistent with the Commonwealth's environmental protection policies as set forth in Chapter 164 of the General Laws and with other state and local environmental policies as described below.

6.3.1 The Restructuring Act

The Restructuring Act provides that the Company must demonstrate that the Project minimizes environmental impacts consistent with the minimization of costs associated with mitigation, control, and reduction of the environmental impacts of the Project. Accordingly, an assessment of all impacts of a proposed facility is necessary to determine whether an appropriate balance is achieved both among conflicting environmental concerns as well as among environmental impacts, cost, and reliability.

A facility that achieves the appropriate balance thereby meets the Chapter 164 requirement to minimize environmental impacts at the lowest possible cost. To determine if a petitioner has achieved the proper balance among environmental impacts, cost, and reliability, the Siting Board first determines if the petitioner has provided sufficient information regarding environmental impacts and potential mitigation measures in order to make such a determination. The Siting Board then determines whether environmental impacts are minimized. Similarly, the Siting Board evaluates whether the petitioner has provided sufficient cost information in order to determine if the appropriate balance among environmental impacts, cost, and reliability has been achieved.

In Sections 3, 4, and 5 of this Analysis, the Company demonstrated that it compared a range of alternative projects and proposed specific plans to mitigate environmental impacts associated with the construction, operation, and maintenance of the proposed transmission line, consistent with cost minimization. As such, the Project is consistent with the environmental policies of the Commonwealth as set forth in the Restructuring Act.

6.3.2 State and Local Environmental Policies

The Company will obtain all environmental approvals and permits required by federal, state, and local agencies and will construct and operate the Project to comply fully with applicable federal, state, and municipal regulations and environmental policies. Thus, the Project will contribute to a reliable, low cost, diverse energy supply for the Commonwealth while avoiding, minimizing, and mitigating environmental impacts to the maximum extent practicable. Table 6-1, below, identifies the anticipated permits, reviews, and approvals required for the Project (in addition to the Siting Board's review). By meeting the requirements for acquiring each of these federal, state, and local permits, the Project will comply with applicable state and local environmental policies.

6.3.3 Green Communities Act

The Green Communities Act is a comprehensive, multi-faceted energy reform bill that encourages energy and building efficiency, promotes renewable energy, creates green communities, implements elements of the Regional Greenhouse Gas Initiative, and provides market incentives and funding for various types of energy generation. The Green Communities Act (as amended and supplemented by St. 2012, c. 209) has resulted in greater renewable supplies and substantial new conservation initiatives since enactment and continuing in future years. While the primary Project purpose is to ensure a second source of supply to natural gas customers in the Greater Springfield Area in order to maintain natural gas service in the event of a system contingency, the Project will also accelerate the replacement of leak prone pipe in the area, thereby decreasing methane emissions, consistent with the Green Communities Act. Further, as part of the Company's evaluation of project alternatives, full consideration has been given to the efficacy of using carbon-free sources to meet the identified need in a reliable, cost-effective, and environmentally benign manner. The Project, therefore, is consistent with the Green Communities Act.

6.3.4 Global Warming Solutions Act

On August 7, 2008, then-Massachusetts Governor Patrick signed into law the GWSA, which established aggressive GHG emissions reduction targets of 25 percent from 1990 levels by 2020 and 80 percent from 1990 levels by 2050. Among other policies, MEPA established a Greenhouse Gas Emissions Policy and Protocol in May 2010. Pursuant to the GWSA, the EEA

Secretary issued the *Massachusetts Clean Energy and Climate Plan 2020* in December of 2010. In addition, pursuant to the GWSA, the EEA Secretary issued the Clean Energy & Climate Plan for 2020 in December of 2010. Among other provisions, the GWSA obligates administrative agencies, in evaluating and issuing permits, to consider reasonably foreseeable climate change impacts (i.e., additional GHG emissions) and related effects (i.e., sea level rise).

In addition, Governor Baker announced at his State of the Commonwealth address on January 21, 2020 a goal of net-zero GHG emissions by 2050. Subsequently, on April 22, 2020, the Baker-Polito Administration issued its letter of determination formalizing Massachusetts' commitment to net zero carbon emissions by 2050 ("Determination Letter").[29] The Determination Letter, issued by Kathleen A. Theoharides, Secretary of EEA, sets the legal limit under the GWSA as a level of statewide GHG emissions that is equal in quantity to the amount of carbon dioxide or its equivalent that is removed from the atmosphere and stored annually by, or attributable to, the Commonwealth; provided, however, that the level of emissions will not be greater than a level that is 85 percent below the 1990 level. Secretary Theoharides Determination Letter provides that the net-zero plan is "necessary to adequately protect the health, economy, people and natural resources of the Commonwealth and maintain Massachusetts critically important role as a national and international leader in the global effort to reduce GHG emissions that cause climate change in a manner consistent with the goals of the GWSA." Determination Letter at 4. In his 2021 State of the Commonwealth address, Governor Baker reinforced his administration's commitment to the goal of being net-zero by 2050. Additionally, on December 30, 2020, Secretary Theoharides issued a "Clean Energy and Climate Plan for 2030" based upon the Commonwealth's "2050 Decarbonization Roadmap" published on the same date. These plans create an emissions target level of 45 percent below 1990 levels in 2030.

The Project is fully consistent with these objectives for several critical reasons. First, the standard established by the Commonwealth, a longer term "net zero" standard, is clearly not akin to an immediate ban on the development of natural gas infrastructure or the installation of natural gas appliances, where appropriate and needed. Indeed, the net-zero standard on emissions simply requires that, for whatever emissions are generated, there need to be offsetting and greater reductions in other areas by 2050 ultimately (and 2030 in the interim). To that end, the Baker administration carefully framed its net-zero standard in recognition of current energy policies, including the ongoing need for a safe and reliable supply of energy for consumers and businesses, of which natural gas is a critical element and serves as an important bridge to new technologies while also being more environmentally benign than other fossil fuels. Thus, the increased use of natural gas by the fleet of electric generation serving the region and for providing needed energy to homes and businesses has been a crucial element of the reduction in emissions that has been achieved over recent decades. For its part, Eversource has been proactive in identifying, developing and implementing potential sources of emissions reductions in order to "net out" the necessary emissions associated with the continued use of natural gas in the Commonwealth. Those Eversource initiatives include aggressive implementation of widely acclaimed energy efficiency programs for customers,[30] development and implementation of new energy

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29 https://www.mass.gov/doc/final-signed-letter-of-determination-for-2050-emissions-limit/download

30 Eversource has increased its energy efficiency savings achievements significantly since the enactment of the Green Communities Act in 2008 and was ranked as the number one energy efficiency provider in the U.S. in terms of both incremental annual energy efficiency and life-cycle energy efficiency (Ceres, 2016).

technologies[31] facilitating the change out of oil heating system to natural gas, and creation of regulatory programs aimed at demand response and customer education.[32] Thus, the efficient, safe and reliable use of natural gas is consistent with the GWSA and an integral component of the Commonwealth's overall emission reduction goals.

Second, the newly constructed pipe will be carefully constructed and rigorously tested and will have no risk of age-related deterioration or leakage associated with the operation of older pipeline facilities. Certain construction and transient decommissioning/commissioning activities associated with the Project will generate temporary emissions of GHG; however, Eversource's procedures and BMPs will minimize and avoid these temporary emissions. The GHG emissions described in this section are consistent with typical distribution system asset replacement activities. Importantly, the Project will allow the acceleration of replacement of leaking facilities throughout the greater Springfield area by providing another source of supply to the region. Overall, Eversource's policies and procedures, along with the Project design and opportunities for distribution replacement, consider opportunities to minimize natural gas releases to atmosphere. Further, Project execution and all leak replacement is carefully planned to minimize venting and purging operations.

Third, as referenced above, the Project will increase reliability of gas supply in the greater Springfield area. Among other provisions, the GWSA obligates administrative agencies such as the Siting Board, in considering and issuing permits, to consider reasonably foreseeable climate change impacts (e.g., additional GHG emissions) and related effects (e.g., sea level rise). The proposed Project itself will have no adverse climate change impacts or negative effects on sea levels.

Based upon the above, the Project is fully consistent with the Commonwealth's GWSA goals and objectives

6.3.5 An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy

On March 26, 2021, Governor Baker signed Chapter 8 of the Acts of 2021, "An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy" (the "Climate Act"). The Climate Act codified the Baker Administration's commitment to net-zero emissions by 2050. The Climate Act advances and extends the goals of the GWSA by, inter alia, establishing new interim goals

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31 In its decision approving the Company's rate case in D.P.U. 19-120, the Department approved a test geothermal distribution network representing a cross-section of the categories of customers and conditions that the Company expects to encounter in the field if geothermal network distribution services are offered on a broader scale. This demonstration project has an estimated cost of approximately $14 million and is anticipated to take three years, at the end of which the Company will be in a position to evaluate the deployment of geothermal technologies more broadly throughout its system.

32 In its most recent base rate case in D.P.U. 19-120, the Company also proposed a three-year gas demand response pilot estimated to cost almost $3 million to test the viability of a gas demand response program. This demonstration project would include an incentive design that encourages significant reductions during a targeted window of time and a bonus incentive for reducing gas demand over the course of the day. The Company has also proposed to preclude the use of liquid fossil backup heating sources by pilot participants to ensure there is an overall beneficial environmental impact.

for emissions reductions and authorizing a voluntary energy efficient building code for municipalities. The interim goals include that by 2030, emissions must be 50% lower than they were in Massachusetts in 1990, and by 2040, they must be 75% lower. In addition, the Climate Act allows the Commonwealth to procure an additional 2,400 megawatts of offshore wind energy by 2027.

The Climate Act also contains several provisions that enhance and codify the Commonwealth's EJ policies. Specifically, the Climate Act authorizes the Secretary of EEA to require project proponents to improve the opportunities for meaningful participation by persons in EJ populations within proximity to proposed projects. To implement certain aspects of the Climate Act, the MEPA Office has developed regulations and protocols for EJ outreach and public involvement, as well as for enhanced comprehensive environmental and health impact analyses. To that end, Eversource has undertaken a comprehensive public outreach program to identify and solicit comments from EJ communities (see Attachment I) and as part of the MEPA process will be required to prepare an EIR, which will include: (1) an assessment of existing unfair or inequitable environmental burden; (2) analysis of Project impacts to determine disproportionate adverse effect; (3) analysis of project impacts to determine climate change effects; and (4) mitigation and section 61 findings for EJ populations.

Relatedly, the Department and the Siting Board are undertaking their own investigations to enhance opportunities for diverse populations to meaningfully participate in their proceedings. See Inquiry by the Department of Public Utilities on its Own Motion Into Procedures for Enhancing Public Awareness of and Participation in its Proceedings, D.P.U. 21-50 (opened on April 16, 2021); Inquiry by the Energy Facilities Siting Board on its Own Motion Into Procedures for Enhancing Public Awareness of and Participation in its Proceedings, EFSB 21-01 (opened on July 1, 2021).

As discussed in more detail in Sections 4 and 5 of this Analysis, the Project traverses EJ neighborhoods in the Project area and there are additional EJ neighborhoods within a one-mile radius of Longmeadow POD, Bliss Street Regulator and pipeline routes, including in portions of Springfield, West Springfield and Agawam. The Company facilitated meaningful participation of residents of the proximate EJ communities by encouraging participation in outreach activities and soliciting feedback from the neighborhoods the Project will traverse. The Company employed additional outreach strategies including providing notifications of the Project and Project open houses in English and Spanish and holding several virtual community events with translation services.

Moreover, the Company's environmental analysis is designed to minimize the Project's impacts to all populations, including EJ populations. The Company has undertaken, and will continue to undertake, ongoing community outreach in EJ communities in or adjacent to the Project area to facilitate the meaningful opportunity to participate by all. As such, the Project is consistent with the Commonwealth's EJ policies as codified in the Climate Act.

6.3.6 Comprehensive Energy Plan

The Massachusetts Comprehensive Energy Plan, published on December 18, 2018, is the product of Executive Order 569, signed by Governor Charlie Baker on September 16, 2016. The Executive Order presents an "integrated strategy" to effectuate the GWSA which includes the direction to:

> publish, within two years of this Order, and update every five years thereafter, a comprehensive energy plan which shall include and be based upon reasonable projections of the Commonwealth's energy demands for electricity, transportation, and thermal conditioning, and include strategies for meeting these demands in a regional context, prioritizing meeting energy demand through conservation, energy efficiency, and other demand-reduction resources in a manner that contributes to the Commonwealth meeting each of these limits.

Executive Order 569, at ¶ 5. As noted above, the Project is consistent with the GWSA and to the extent that the Comprehensive Energy Plan seeks to implement and effectuate the GWSA, is consistent with that goal as well.

Further, the Project is consistent with findings and discussion contained within the Comprehensive Energy Plan (the "Report"). For example, the Comprehensive Energy Plan states:

> Reliability and affordability in the winter continues to challenge the region due to a high reliance on natural gas for both electric generation and heating. In the winter, demand for natural gas to both heat the Commonwealth's buildings and generate electricity relies on stored fuels such as LNG and oil to meet demand needs. Even with aggressive investment in new clean electricity sources, demand reduction and energy efficiency measures, reliability and price volatility risks in the winter remain for the electric sector. **Mitigating natural gas constraints would eliminate the need to turn to high cost, carbon-intensive oil to satisfy demand during an extended cold weather event.**

On Page 145, the Report acknowledges that under all of the scenarios examined therein, conservation measures are not sufficient to meet the identified need of resolving reliability and capacity constraints during peak periods:

> **In all policy scenarios**, natural gas demand decreases by 2022 due to the increased renewable generation from recent procurements and from additional efficiency gains. The Aggressive Conservation and Fuel Switching scenario shows the greatest reduction in total natural gas demand supported by a significant decrease in the thermal demand on a winter day due to increased electrification and building shell efficiency. **However, even significant increases in all mechanisms to reduce natural gas demand; conservation, fuel switching, and additional clean electricity generation; are not enough to eliminate the risk of constrained and expensive natural gas supplies** for electricity.

Report at 145 (emphasis added). The Report acknowledges that "Pipeline capacity is determined by the diameter of the pipe (how much gas can flow through) and the number, power, and location of compressor stations (how well can pressure be maintained during high flow conditions)." Report at 55. It bears noting that the proposed Project specifically removes the risk of loss of

service to 58,000 customers in the event of a potential contingency in the Greater Springfield area; a contingency that could result in the extended loss of service to customers during the peak heating season. Further, the Report states:

> **total natural gas demand** from both the thermal and electric sectors on a peak winter day currently and in 2022 and 2025. **In all scenarios, the total demand (thermal and electric) exceeds the anticipated pipeline capacity**, meaning the region will continue to rely on stored LNG during extreme winter conditions. **Increased LNG storage combined with current infrastructure could alleviate these constraints, particularly in the short term. However, sufficient supplies of LNG are not always available due** to the more favorable economics associated with exporting domestic supplies rather than consuming them in the United States and delivery restrictions associated with the Jones Act.

Report at *xxi* (emphasis added). Essentially, under all the scenarios examined by the Report, capacity constraints on the state's natural gas distribution system continue to cause concerns that must be addressed by the Company.

6.3.7 State Environmental Regulations

The Project will obtain all environmental approvals and permits required by federal, state, and local agencies and will be constructed and operated to fully comply with Massachusetts' state and local environmental policies. Thus, the Project will contribute to a reliable, low cost, diverse gas supply for the Commonwealth with minimal environmental impact. The Project will secure state permits including necessary authorizations from MassDEP, MassDOT, and other agencies. The Project will also file an ENF as well as an EIR pursuant to, MEPA's regulations. In addition, the Project will require a Construction General Permit under the National Pollutant Discharge Elimination System ("NPDES") and is expected to file for wetland approvals from local conservation commissions in the communities of Springfield and Longmeadow. Table 6-1, below, identifies the anticipated permits, reviews, and approvals required for the Project (in addition to the Siting Board's review). By meeting the requirements for acquiring each of these programs and permits, the Project will comply with applicable state and local environmental policies.

Table 6-1: Permit List	
Approval Type	**Regulatory Citation**
Local	
Local Street Opening Permits	Town and City Ordinances
Building Permit (for POD)	Town Ordinance
Forest Park Temporary Occupancy approval (for HDD staging)	City Ordinance
State	
Massachusetts Wetlands Protection Act and local bylaws.	310 CMR 10.00 and Town of Longmeadow Wetland Bylaw (Ch 700, Sec. 2-701) and City of Springfield Wetland Bylaws (Chapter 417).
Massachusetts Energy Facilities Siting Board and Department of Public Utilities	G.L. c. 164, § 69J and G.L. c. 40A, § 3.
Massachusetts Environmental Policy Act (MEPA) Certificate, Executive Office of Energy and Environmental Affairs	301 CMR 11.00 - Project required to file ENF per 301 CMR 11.03(7)(b)(3) and an EIR per the requirements of the Climate Act.
MassDOT Permitting – Highway Access Permit	720 CMR 13.00
Office of Dam Safety Review (as applicable)	302 CMR 10
Federal	
National Pollutant Discharge Elimination System Construction General Permit	Title 40 CFR Part 122
National Historic Preservation Act Consultation via the Massachusetts Historical Commission	Section 106 NHPA G.L. c. 9, §§ 26-27C
United States Fish and Wildlife Endangered Species Consultation	Endangered Species Act

6.4 Resource Use and Development Policies

6.4.1 Risk Assessment Investigation

In November 2018, the Department contracted for an independent, statewide examination of the Commonwealth's natural gas distribution network. The Department selected Dynamic Risk Assessment Systems, Inc. ("Dynamic Risk") to develop a report analyzing the integrity and safety of the gas distribution systems owned and operated by gas distribution companies and municipal gas companies within the state. Among other things, Dynamic Risk sought information and perspectives from a broad array of involved entities including regulators, government officials, gas company operators and stakeholder groups. Dynamic Risk issued its "Statewide Assessment of Gas Pipeline Safety" on January 29, 2020 ("Dynamic Risk Assessment" or "Assessment").[33]

Part of the Dynamic Risk Assessment considered "Pipeline Safety and Reliability During Proposed Energy Transition" and determined that pipeline safety concerns associated with an unreliable supply may not have been fully considered in the Commonwealth. Specifically, the Assessment states:

> If natural gas supply is disrupted for any reason – including a disruption of supply from a single source of gas or disruption in the availability of LNG – the Gas Company would need to take emergency actions and make operational changes to manage their systems to address the lack of sufficient supply.
>
> Disruption of a single pipeline source has risks if that source becomes unavailable. Depending on the circumstances, the rupture of a natural gas transmission pipeline could take the pipeline out of service for a few days, weeks, or longer.

Dynamic Risk Assessment at 41-42 (internal footnotes omitted). Moreover, operating under emergency conditions increases the risks of: (1) "losing sufficient pressures to maintain gas delivery to certain customers or portions of a town"; (2) "terminating service to select customers while trying to maintain services to critical need customers"; and (3) "recovering after the event." Id. at 42 n.94. Accordingly, the Dynamic Risk Assessment determined it is important for the Commonwealth "to provide an appropriate focus on strengthening gas supply availability in those instances in which a Gas Company relies on a single source of gas supply." Id. at 43.

Because the Project will decrease risk associated with loss of customers by providing a second, independent source of supply to the area of Greater Springfield, the proposed Project is consistent with the findings and conclusions regarding overall safety of the distribution system made in the Dynamic Risk Assessment.

6.4.2 Department Review of Gas Supply Contracts

In the implementation of these overarching state legislative objectives, Department precedent clearly establishes that the Commonwealth's energy policies do not seek to eliminate or natural gas usage in the Commonwealth. See, e.g., Boston Gas Company d/b/a National Grid, D.P.U. 19-132, at 46-47 (2020) (approving fourteen-year firm transportation agreement pursuant to G.L. c. 164, § 94A); NSTAR Gas Company d/b/a Eversource Energy, D.P.U. 17-175, at 40 (2018); Bay

[33] https://www.mass.gov/doc/dynamic-risk-phase-2-rev-1/download

State Gas Company d/b/a Columbia Gas Company, D.P.U. 17-172, at 51 (2018). The Department has repeatedly noted that gas companies have an obligation to serve existing customers and has consistently approved qualifying gas supply contracts to ensure necessary resources to meet projected customer demand. D.P.U. 19-132, at 46; D.P.U. 17-175, at 42. The Department stated, "[w]hile the Company can incorporate energy efficiency trends and look at non-fossil fuel heating advancements in planning and considering demand at the lowest cost, it still must fulfill its public service public service obligation to provide safe, reliable, and least cost service using the resources available at the time of acquisition." D.P.U. 17-175, at 42; see also D.P.U. 19-132, at 46. In approving such contracts for long-term natural gas supplies, the Department has noted their consistency with the GWSA because "the additional capacity will be used, in part, to serve new customers converting from oil heating to natural gas and, therefore, the Department expects that the acquisition … will further reduce greenhouse case emissions and contribute towards the GWSA goals." D.P.U. 19-132, at 47.

6.5 Conclusion

Thus, based on the foregoing, the continued efficient use of natural gas to serve customers and is a critical and essential part of the Commonwealth's overall energy policy goals and, as such, the Company's proposed Project will further these goals by ensuring the reliable and efficient supply of natural gas to customers in the Springfield area in the event of a contingency. As described above, the Project is also fully consistent with the important state energy and climate change policies as articulated in the Restructuring Act, the Green Communities Act, the GWSA, the Clean Energy Act and the Climate Act. For these reasons, the Company has shown that its proposed Project is "consistent with current health, environmental protection, and resource use and development polices as adopted by the [C]ommonwealth."