Environmental Notification Form

Central to Western Massachusetts Energy Improvement Project

January 2025

PREPARED FOR

New England Power Company
170 Data Drive
Waltham, MA 02451

PREPARED BY

BSC GROUP
803 Summer Street, Third Floor
Boston, MA 02127

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January 15, 2025

Rebecca Tepper, Secretary
Executive Office of Energy and Environmental Affairs Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114
RE: Central to Western MA Energy Improvement Project Environmental Notification Form

Dear Secretary Tepper,

On behalf of the New England Power Company ("NEP"), BSC Group, Inc. is pleased to submit this Environmental Notification Form ("ENF") for various refurbishment activities and system improvements along approximately 67 miles of the E5/F6 Transmission Lines, which extend through Millbury, Auburn, Leicester, Spencer, East Brookfield, North Brookfield, West Brookfield, Ware, Belchertown, Pelham, Shutesbury, Leverett, Sunderland, Deerfield, Conway, and Shelburne in Massachusetts (the "Project"). The proposed Project includes required maintenance and system improvements to mitigate potential risks of electrical failure and to provide reliable delivery of electrical service.

The Project is located within an active utility Right-of-Way ("ROW") and contains existing utility structures, historically used access routes, and managed vegetation areas along the E5/F6 mainline and Tap Lines. Project impacts are associated with the installation of structures, access improvements, work envelopes, and conversion of vegetative cover types (i.e., tree removal). Additionally, temporary impacts related to construction matting are proposed. The Project has been designed to avoid adverse impacts to the greatest extent practicable.

NEP is submitting this ENF because the Project requires several state agency actions, and exceeds or potentially exceeds seven MEPA thresholds. NEP respectfully requests that MEPA allow a Draft Environmental Impact Report ("DEIR") filing in accordance with 301 CMR 11.06(8).

Please publish the Notice of Availability for this ENF in the January 24, 2025 Environmental Monitor to initiate the 30-day public review and comment period. Electronic copies will be distributed to public agencies, the EJ Reference List, and municipal officials in accordance with 301 CMR 11.16(2) (see Appendix B: MEPA ENF Circulation List) before or on the date of publication. The Public Notice of Environmental Review was published in local newspapers on December 16, 2024 in accordance with 301 CMR 11.15(1).

Please do not hesitate to contact me at (617) 896-4570 or pshrestha@bscgroup.com or Mike Tyrrell with NEP at michael.tyrrell@nationalgrid.com with any questions or comments.

Sincerely,
BSC Group, Inc.

Priyanka Shrestha
Environmental Permitting Specialist, Associate

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Acronyms	
ACEC	Areas of Critical Environmental Concern
ACR	Asset Condition Refurbishment
ACSS	Aluminum-Conductor Steel-Supported Conductor
AUL	Activity and Use Limitation
Bank	Inland Bank
Bgs	Below Ground Surface
BIL	Bipartisan Infrastructure Law
BLSF	Bordering Land Subject to Flooding
BMP	Best Management Practices
BVW	Bordering Vegetated Wetland
CMP	Conservation & Management Permit
CMRPC	Central Massachusetts Regional Planning Commission
CO_2	Carbon dioxide
CSX	Chessie Seaboard X
CVP	Certified Vernal Pools
Cy	Cubic yards
DCR	Department of Conservation and Recreation
DEIR	Draft Environmental Impact Report
DER	Distributed Energy Resources
DGA	Designated Geographic Area
DPS	Downgradient Property Status
DPU	Massachusetts Department of Public Utilities
EEA	Executive Office of Energy and Environmental Affairs
EFSB	Energy Facility Siting Board
EIR	Environmental Impact Report
EJ	Environmental Justice
ENF	Environmental Notification Form
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
ft	Feet/Foot
GHG	Greenhouse Gas
GPD	Gallons per day
GW	Gigawatts
GWSA	Global Warming Solutions Act
HASP	Health and Safety Plan
ISO	Independent System Operator

Acronyms	
ISO-NE	Independent System Operator-New England
kV	Kilovolts
lf	Linear Feet
LOD	Limit of Disturbance
LSCSF	Land Subject to Coastal Storm Flowage
LSP	Licensed Site Professionals
LUW	Land Under Water Bodies and Waterways
MA	Massachusetts
MassDEP	Massachusetts Department of Environmental Protection
MassDOT	Massachusetts Department of Transportation
MCM	Thousands of Circular Mils
MassGIS	Massachusetts Geographic Information Systems
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Protection Act
MESA	Massachusetts Endangered Species Act
M.G.L	General Laws of Massachusetts
MHC	Massachusetts Historical Commission
MVP	Massachusetts Municipal Vulnerability Preparedness
NECR	New England Central Railroad
NEP	New England Power Company
NERC	North American Electric Reliability Commission
NESCOE	New England States Committee on Electricity
NHESP	Natural Heritage and Endangered Species Program
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NPCC	Northeast Power Coordinating Council, Inc.
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OPGW	Optical Primary Ground Wires
ORW	Outstanding Resource Water
P&W	Providence and Worcester
PAL	Public Archaeology Laboratory, Inc.
PAR	Pan Am Railways
PAS	Pan Am Systems
PCB	Polychlorinated biphenyls
PPE	Personal Protective Equipment
PVPs	Potential Vernal Pools

Acronyms	
RA	Riverfront Area
RAO	Response Action Outcome
RGGI	Regional Greenhouse Gas Initiative
RMAT	Resilient Mass Action Team
ROW	Right-of-Way
RTN	Release Tracking Number
SMP	Soil Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
UMass	University of Massachusetts
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
UTM	Universal Transverse Mercator Coordinates
VP	Vernal Pool
WPA	Wetlands Protection Act
WQC	Water Quality Certification
WsPA	Watershed Protection Act Permit

Environmental Notification Form

For Office Use Only

EEA#:

MEPA Analyst:_____

The information requested on this form must be completed in order to submit a document electronically for review under the Massachusetts Environmental Policy Act, 301 CMR 11.00.

Project Name: Central to Western Massachusetts Energy Improvement Project		
Street Address: Existing E5/F6 Overhead Transmission Lines Right-of-Way ("ROW")		
Municipality: Auburn, Belchertown, Conway, Deerfield, East Brookfield, Leicester, Leverett, Millbury, North Brookfield, Pelham, Shelburne, Shutesbury, Spencer, Sunderland, Ware, and West Brookfield	**Watershed:** Blackstone, Chicopee, Connecticut, Deerfield, and French	
Universal Transverse Mercator Coordinates: UTM Easting UTM Northing 273240.974 4674544.309 685667.242 4721167.475	**Latitude:** 42° 11' 24.687" to 42° 37' 14.1096" **Longitude:** -71° 44' 46.107" to -72° 44' 9.7362"	
Estimated commencement date: April 2029	**Estimated completion date:** November 2034	
Project Type: Overhead Transmission Line	**Status of project design:** 75% complete	
Proponent: New England Power Company ("NEP")		
Street Address: 170 Data Drive		
Municipality: Waltham	**State:** MA	**Zip Code:** 02451
Name of Contact Person: Priyanka Shrestha		
Firm/Agency: BSC Group, Inc.	**Street Address:** 803 Summer Street, Floor 3	
Municipality: Boston	**State:** MA	**Zip Code:** 02127
Phone: +1 617-896-4570	**Fax:**	**E-mail:** CWMA-EIP@bscgroup.com

Does this project meet or exceed a mandatory EIR threshold (see 301 CMR 11.03)?
☒Yes ☐No

If this is an Expanded Environmental Notification Form (ENF) (see 301 CMR 11.05(7)) or a Notice of Project Change (NPC), are you requesting:

a Single EIR? (see 301 CMR 11.06(8)) ☐Yes ☐No
a Rollover EIR? (see 301 CMR 11.06(13)) ☐Yes ☐No
a Special Review Procedure? (see 301CMR 11.09) ☐Yes ☐No
a Waiver of mandatory EIR? (see 301 CMR 11.11) ☐Yes ☐No
a Phase I Waiver? (see 301 CMR 11.11) ☐Yes ☐No

(Note: Greenhouse Gas Emissions analysis must be included in the Expanded ENF.)

Which MEPA review threshold(s) does the project meet or exceed (see 301 CMR 11.03)?

This Project exceeds or potentially exceeds the following Massachusetts Environmental Protection Act ("MEPA"), Environmental Impact Report ("EIR") and Environmental Notification Form ("ENF") thresholds:

Table 1: MEPA EIR and ENF Thresholds Potentially Exceeded by the Project

MEPA EIR Threshold
EIR: Land: Direct alteration of 50 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices. (301 CMR 11.03(1)(a))
EIR: Wetlands, Waterways and Tidelands: Alteration of one or more acres of Bordering Vegetated Wetlands ("BVW"). (301 CMR 11.03(3)(a)(1)(a))
EIR: Wetlands, Waterways and Tidelands: Alteration of ten or more acres of any other wetlands. (301 CMR 11.03(3)(a)(1)(b))
EIR: Environmental Justice ("EJ"): The Secretary shall require an Environmental Impact Report ("EIR") for any Project that is located within a Designated Geographic Area ("DGA") around an EJ Population. (301 CMR 11.06(7)(b))
MEPA ENF Thresholds
ENF: Wetlands, Waterways and Tidelands: Alteration of 500 or more linear feet ("lf") of bank along a fish run or Inland Bank ("Bank"). (301 CMR 11.03(3)(b)(1)(b))
ENF: Wetlands, Waterways and Tidelands: Alteration of one half or more acres of any other wetlands. (301 CMR 11.03(3)(b)(1)(f))
ENF: Rare Species: "Taking" of an endangered or threatened species or species of special concern, provided that the Project site is two or more acres and includes an area mapped as a Priority Site of Rare Species Habitats and Exemplary Natural Communities. (301 CMR 11.03(2)(b)(2)). (Potential: consultation with Natural Heritage and Endangered Species Program ("NHESP") ongoing.)

Which State Agency Permits will the project require?

The following State Agency Permit or Approvals are anticipated:

Table 2: Anticipated State Agency Permits and Approvals

Agency	Permit/Review/Approval
Executive Office of Energy and Environmental Affairs ("EEA")	MEPA Review – Secretary's Certificate
Massachusetts Department of Environmental Protection ("MassDEP")	Section 401 Individual Water Quality Certificate ("WQC") and Variance
Massachusetts Natural Heritage and Endangered Species Program ("NHESP")	Massachusetts Endangered Species Act ("MESA") – Determination of "take" or No "take"; Conservation & Management Permit ("CMP") (if needed)
Massachusetts Historical Commission ("MHC")	Consultation under General Laws of Massachusetts ("M.G.L.") c. 9 in accordance with 950 70-71
Energy Facilities Siting Board ("EFSB")	G.L. c. 164, §69J Petition for Approval to Construct Transmission Lines
Massachusetts Department of Public Utilities ("DPU")	G.L. c. 164, §72 Petition for Determination of Public Necessity and Convenience
Department of Conservation and Recreation ("DCR")	Watershed Protection Act ("WsPA") Determination of Applicability or Variance (if required); Construction & Access Permit; and Short-term and Vehicle Access to Quabbin and Ware River Watershed System Permit
Massachusetts Department of Transportation ("MassDOT")	Permit to Access State Highway/Non-Municipal Utility Permits for crossing over of state roads with utility lines.

Identify any financial assistance or land transfer from an Agency of the Commonwealth, including the Agency name and the amount of funding or land area in acres:

Not applicable. No financial assistance or land transfer will be associated with this Project.

Table 3: Summary of Project Size and Environmental Impacts

Summary of Project Size and Environmental Impacts	Existing	Change	Total
Land			
Total site acreage	1,125 +/-		
New acres of land altered		561 +/-[1]	
Acres of impervious area	35 +/-	0.25 +/-[2]	35.25
Square feet of new bordering vegetated wetlands alteration		2,704,439[1]	
Square feet of new other wetland alteration[1]		Bordering Land Subject to Flooding ("BLSF"): 355,418[1] Riverfront Area ("RA"): 2,623,699[1] Bank: 16,471 (linear feet)[1] Land Under Water Bodies and Waterways ("LUW"): 38,916[1,3] Isolated Wetland: 95,327[1]	
Acres of new non-water dependent use of tidelands or waterways		N/A	
Structures			
Gross square footage	N/A	N/A	N/A
Number of housing units	N/A	N/A	N/A
Maximum height (feet)	95	50	145
Transportation			
Vehicle trips per day	N/A	N/A	N/A
Parking spaces	N/A	N/A	N/A
Wastewater			
Water Use (Gallons per day ["GPD"])	N/A	N/A	N/A
Water withdrawal (GPD)	N/A	N/A	N/A
Wastewater generation/treatment (GPD)	N/A	N/A	N/A
Length of water mains (miles)	N/A	N/A	N/A
Length of sewer mains (miles)	N/A	N/A	N/A

Note: Values are conservative estimates. Some resource areas overlap and may result in overlapping impacts.

1 Alteration includes conversion of vegetative cover types, temporary construction matting, permanent and temporary work and pull pad areas, and new and improved access.

2 Includes the replacement of existing structures with larger caisson supported structures.

3 Includes LUW resources that are greater than 30-feet wide.

Has this project been filed with MEPA before?

☐ Yes (EEA #_____) ☒ No

Has any project on this site been filed with MEPA before?

☐ Yes (EEA #_____) ☒ No

GENERAL PROJECT INFORMATION – all proponents must fill out this section

PROJECT DESCRIPTION:

Describe the existing conditions and land uses on the project site:

New England Power Company ("NEP") is proposing an asset condition refurbishment ("ACR") of the existing E5 and F6 69 kilovolt ("kV") double-circuit overhead electric transmission lines ("E5/F6 Lines" or "the Lines") and seven interconnecting 69 kV Tap Lines[1] ("Taps" or "the Tap Lines"). The overall project is referred to as the Central to Western Massachusetts Energy Improvement Project (the "Project"). The Project will be located within the existing E5/F6 mainline Right-of-Way ("ROW") as well as the existing Tap Line ROWs. The E5/F6 mainline connects the Deerfield #4 Substation to the Millbury #305 Substation in Millbury, and supplies power to NEP's Pondville, Leicester, Harrington, Lashaway, Belchertown, and Shutesbury Substations. The seven interconnecting Tap Lines include:

- Pondville #26 Tap in Auburn;
- Leicester #21 Tap in Leicester;
- Harrington #2234 Tap in East Brookfield;
- Lashaway #525 Tap in North Brookfield;
- Quabbin Switch Tap in Belchertown;
- Shutesbury #704 Tap in Shutesbury; and
- Deerfield #3 Tap in Shelburne.

Please refer to the United States Geological Survey ("USGS") Map and MEPA General Purpose Plans (the "Plans") in **Attachment A: Project Figures** for more information.

The Project ROW is generally oriented northwest-to-southeast, through the Towns of Shelburne, Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and Millbury, MA. All Project activities will be located within these 16 municipalities. The existing E5/F6 Lines are supported primarily on double-circuit lattice towers and steel pole structures ("structures"). The existing Tap Lines consist of two parallel single circuit lines, and are comprised of steel and wood pole structures. Please refer to **Figure 1** for an overview of the Project ROW.

1 Tap Lines are transmission lines that serve as a connection between a primary transmission line (i.e., the mainline) and a substation facility.

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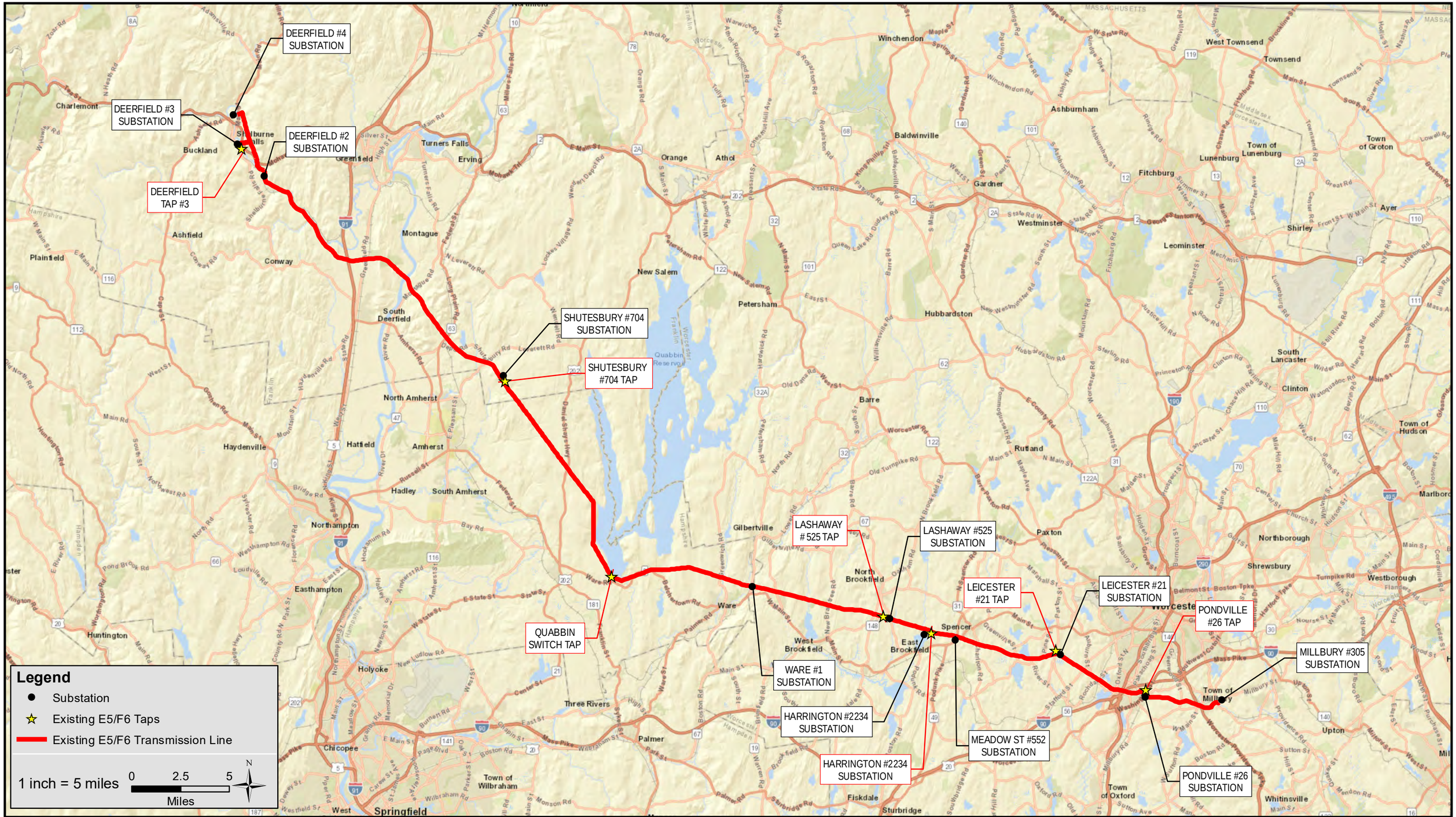

Central to Western Massachusetts Energy Improvement Project

nationalgrid
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Figure 1-1
Overview of the Project Route

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Existing Conditions and Land Use

The land within the ROW has been actively utilized and maintained as a transmission line corridor since the 1900s. Today, the Lines and Tap Lines provide electricity to 26 cities and towns in Massachusetts and transmit power from the Deerfield #2, #3, and #4 generating stations to the New England region. The Existing Lines are the sole transmission source for approximately 24,000 customers in 12 Massachusetts municipalities. The Project ROW[2] is approximately 67 miles long; 80-feet ("ft") to 125-ft in easement width, with some areas up to 200-ft in easement width; and 1,125 acres in total land area.

Using current MassGIS Land Use/Land Cover data layers, land use characteristics were evaluated for the existing ROW and a 300-ft buffer on either side of the ROW. Land use is predominantly Exempt Property.[3] Vacant land use is the second most common parcel designation within the ROW, followed by industrial land use, and residential land use. Similarly, residential land use is the second most common parcel designation within 300-ft of the ROW designation, followed by mixed and vacant land uses. The ROW crosses three reservoirs (Atkins, Ludlow, and Quabbin), and rivers, ponds, streams, and wetland systems.

Table 4 summarizes the Massachusetts Geographic Information Systems ("MassGIS") land use information for the ROW and adjacent uses.

Table 4: Land Use

Land Use Type	Within the ROW (acres)	% Within ROW	Study Buffer (acres)	% Within 300-ft of ROW
Agricultural/Horticultural	41	4%	185	4%
Commercial	12	1%	67	1%
Exempt Property	264	23%	1,328	26%
Forest Land	86	8%	391	8%
Industrial	167	15%	367	7%
Mixed Use	138	12%	708	14%
Recreation	17	1.5%	73	1%
Residential	167	15%	1,032	21%
Transportation	2	<1%	147	3%
Unknown*	2	<1%	4	<1%
Vacant	221	20%	645	13%
Water	7	1%	86	2%
Total	**1,124**	**100%**	**5,033**	**100%**

Source: Massachusetts Geographic Information Systems ("MassGIS"), June 2022. 2020-2022 municipality parcel data and corresponding codes as land use type. Percent values are rounded.

Note: Based on guidelines developed by the Department of Revenue, each Board of Assessors determines the proper classification of property according to its use. "Unknown" Land Use has not yet been classified by the applicable municipality and/or passed the MassGIS Quality Assurance procedures required for publishing.

2 Henceforth, Project ROW refers to the mainline and Tap Line ROWs, unless noted otherwise.

3 Exempt Property qualifies for tax exemption under various provisions of the law and include public land and facilities, hospitals, schools, churches and cultural institutions, M.G.L. Chp. 59 §5. This category of land use includes federal, state, and local land (municipal and authorities); charitable (hospitals, cemeteries); and educational institutions.

Fifty federal, state, private, municipal, and non-profit owned open space lands are located within or adjacent to the Project ROWs, consisting of a total of approximately 2,181 acres of open space. Of this total, 377 acres are within the Project ROW. The primary purposes of these protected lands include recreation, conservation, water supply protection, and cultural/historical preservation. The Department of Conservation and Recreation ("DCR") owns reservoirs, conservation lands, and State forests that fall within the 300-ft buffer, including the Connecticut River Greenway State Park, Daniel S. Horgan Memorial Skating Rink, Quabbin Reservoir Watershed, South River State Forest, Spencer State Forest, and West Brookfield State Forest.

The majority of Project construction activities will take place within the existing ROWs to minimize impacts to adjacent open spaces. NEP's easements for the Lines and Tap Lines predate the establishment of DCR properties and state forests in these areas. The Project is proposed to be constructed on NEP-owned land or easement, and within an existing transmission line ROW, and necessary measures will be taken to ensure no damage to open space resources. The Project has been designed to utilize existing access within NEP easements wherever feasible. However, temporary improvements to existing off-ROW access will be required within state forest lands. Any off-ROW access improvements will be restored in coordination with DCR as part of the Construction Access Permit ("CAP") process.

Describe the proposed project and its programmatic and physical elements:

NOTE: The project description should summarize both the project's direct and indirect impacts (including construction period impacts) in terms of their magnitude, geographic extent, duration and frequency, and reversibility, as applicable. It should also discuss the infrastructure requirements of the project and the capacity of the municipal and/or regional infrastructure to sustain these requirements into the future.

The Lines have been among the least reliable lines on the NEP transmission system, consistently experiencing an unusually high rate of outages; in the past 5 years, the Lines have experienced 61 outages. Originally constructed in the early 1900s and refurbished in 2001, and reinsulated in 2020, they are among the oldest transmission lines in New England and are supported by the original 711 structures. The structures and wires are in need of replacement due to asset condition and aging infrastructure. When compared to industry standards, shielding angles are poor. There are close, tall trees along the ROW likely contributing to the poor performance of the Lines. As with the Lines, the existing Tap Lines have a poor operating history and have insufficient capacity to interconnect renewables to the electric grid. The Tap Lines are currently supported on 34 wood and steel structures. Generally, the aging structures along the Lines pose a threat to the reliability of the transmission system.

In addition, the access conditions vary considerably throughout the ROW. In some areas, existing access is in need of significant repair and does not meet NEP's standard to safely support specialized equipment. As such, the Project's primary purpose is to complete required system improvements that will address poor asset condition, mitigate potential risks of electrical failure, and provide long-term reliable delivery of electrical service and maintenance of the lines. As part of the proposed refurbishment and to provide high speed communications between substations, optical ground wires ("OPGWs") will be used to replace the existing shield wire. Refer to **Attachment A: Project Figures** that depict existing conditions and the proposed activities along the length of the ROW.

To address these concerns, NEP proposes to replace the Lines and Tap Lines within their existing ROWs. Replacing these degraded assets will increase the reliability of the lines. The

Project also includes installation of two new OPGWs, one for each line, which will provide improved fault protection[4] and an upgraded communications path that will allow for high-speed communication between the remote ends of the Lines. NEP proposes to construct the Lines using its 115 kV design standards even though there are currently no immediate reliability needs that would necessitate the operation of the Lines at 115 kV within the 10-year planning horizon. Even when operating at 69 kV, the Lines will provide increased capacity due to the proposed use of Aluminum Conductor Steel Supported ("ACSS") conductor. Notably, the Lines will support future operation at 115 kV, which will provide flexibility in meeting future transmission system needs as the implementation of electrification and climate change initiatives in the Commonwealth increase across the state. Furthermore, the grid is designed to meet reliability standards and criteria developed by the North American Electric Reliability Commission ("NERC"), which sets the minimum standards for electric power transmission for all North America, the Northeast Power Coordinating Council, Inc. ("NPCC") and the Independent System Operator-New England ("ISO-NE").

Project Activities:

The existing Project ROW is currently used for utility activities, including existing utility structures, access, and active vegetation management. Construction activities will be confined to the Limit of Disturbance ("LOD") as shown in **Attachment A: Project Figures**. The Project ROW is generally 80-ft to 125-ft in easement width, with an easement width in some areas of up to 200-ft in both the mainline and Tap Lines ROWs.

Information on system improvement activities for the purpose of refurbishment work, including construction access, are summarized below. Updated and additional information on means and methods of construction and maintenance activities will be provided in the Draft Environmental Impact Report ("DEIR").

The refurbishment activities will include:

- Replacing the existing double circuit steel, lattice tower, and wood structures with a combination of steel double circuit monopole davit arm and steel single circuit monopole structures. The replacement structures are on average 85 ft aboveground,[5] and will provide improved reliability and climate resilience. Suspension type structures will be supported by either direct embedded or caisson foundations. Alternative foundation types such as helical piles, steel vibratory caisson foundations, or micro pile foundations may be utilized if warranted by site conditions or other factors.
- Performing vegetation management (mowing and tree removals) to provide access to the proposed structure locations, to facilitate safe vehicular and equipment passage, to provide safe work sites for personnel, and to meet conductor clearance requirements. The Project will remove vegetation in some areas that currently do not meet these widths, of up to 125-ft in easement width.

4 Fault protection helps prevent contact with live wires during atypical conditions, such as downed power lines from storm events.

5 Due to the outage constraints associated with the E5/F6 Lines, construction will occur with energized lines and utilize live line construction techniques. As such, the proposed replacement structures must be installed at a height above the existing structures that ensures worker and equipment safety.

- Performing access improvements, including grading and the addition of stone to existing access, as well as the construction of new access routes (where required). Efforts were made to align access with previously utilized routes and pathways along and adjacent to the ROW where feasible. New access was sited within the existing ROW easement to the extent feasible; however, due to existing site constraints (e.g., steep slopes, rocky outcrops, proximity to wetland resource areas), some access routes are sited outside the current easement but within NEP access rights. All new access (including those which extend outside the current easement) will be maintained by NEP.[6,7]
- Replacing the existing copper conductor with 795 Thousands of Circular Mils ("MCM") ACSS conductor which will improve system reliability and allow the lines to operate at 115 kV voltage at a future date.
- Replacing the existing shield wire with two OPGWs. These serve the dual function of providing shielding for the conductor, as well as allowing for high-speed communications between substations.
- Install 20 new 115kV manually operated 3000A load break switches.

Proposed Impacts:

Because this Project is a refurbishment of an existing transmission line, area residents and businesses will benefit directly from the upgrades through increased system reliability. The Project has been designed to avoid adverse impacts to the extent feasible. As an active ROW, most of the Project ROW is already disturbed and maintained. Project impacts include tree removal and vegetation management; work within wetland resource areas; and work within mapped rare species habitat. The majority of wetland impacts are temporary and are related to the use of construction matting and the temporary use of stabilizing material within work areas during construction. Permanent wetland alteration is primarily associated with the conversion of forested edge wetland areas to scrub-shrub due to tree removal, which is necessary for the safe and reliable operation of the Lines and is anticipated to create a benefit to successional wildlife. New structures in Bordering Vegetated Wetland ("BVW"), Bordering Land Subject to Flooding ("BLSF"), and Riverfront Area ("RA") have been avoided and minimized to the extent feasible and the remaining permanent impacts in these resource areas will be minimal amounts of permanent fill and conversion of vegetative cover types. Additional information on procedures and policies implemented during construction for ROW access, maintenance, and construction Best Management Practices ("BMPs") will be provided in the DEIR.

The Project exceeds or potentially exceeds the MEPA thresholds identified **Table 1**. Potential and temporary impacts, including alterations, to all resource categories are summarized in **Table 5** below. A total resource area impact cannot be summed from this table due to overlapping resource areas and conflicting units.

6 Any off-ROW access will be restored. A Construction Access Plan will be developed, and will include the planned restoration process.

7 New and improved access are categorized as follows, as seen in **Attachment A: Project Figures**: "Type R" access, where only minor repairs are required (such as the filling of ruts and potholes) and no widening of these accesses are proposed. "Type S" access (typically found in environmentally sensitive areas), where widening through the addition of stone/gravel may be proposed and grading is restricted. "Type 1-5" access, more extensive grading and widening is required. "Type S" and "Type R" are considered access improvements, while "Types 1-5" may be considered new construction.

Table 5: Summary of E5/F6 Transmission Lines Refurbishment Impacts

Resource Area	Temporary Impacts	Permanent Impacts/Conversion
New Land Altered	N/A	Total – approximately 561 +/- acres • Conversion of vegetative cover types (240 +/- acres)[1]
Bordering Vegetated Wetland ("BVW")	Total – approximately 42 +/- acres • Construction mats for access where BVW crossings could not be avoided • Temporary work envelopes, including construction mats for work pads and pull pads that overlap with BVW	Total – approximately 20 +/- acres • Fill for replacement structure foundations in BVW (0.03 acres +/-) • Conversion of vegetative cover types[1]
Other Wetland Resource Areas		
Inland Bank ("Bank")	Total – approximately 6,803 linear ft • Construction mats where access cross Bank[2]	Total – approximately 9,668 linear ft
Riverfront Area ("RA")	Total – approximately 31 +/- acres • Vegetation management activities • Temporary work envelopes, including construction mats for work pads and pull pads • Temporary access modifications, which will be restored postconstruction	Total – approximately 29 +/- acres • New/improved access • New/replacement structure foundations • Cut/fill for access, and work envelopes • Stabilization material in new/improved sections of existing access
Bordering Land Subject to Flooding ("BLSF")	Total – approximately 4 +/- acres • Vegetation management activities • Temporary work envelopes and pull pads, including construction mats for work pads and pull pads where BLSF overlaps with residential lawn or agricultural land	Total – approximately: 4 +/- acres sf • New/improved access • New/replacement structure foundations • Cut/fill for work envelopes and access; areas will be over-excavated so that no loss in flood storage occurs
Land Under Water Bodies and Waterways ("LUW")	Total – approximately 0.4 +/- acre • Temporary work envelopes, including construction mats for work pads where spanning open water is not feasible	N/A[3]
Isolated Wetland	Total – approximately 2 +/- acres • Vegetation management activities • Temporary work envelopes, including construction mats for access and work envelopes that overlap with Isolated Wetlands	Total – approximately 0.6 +/- acre • Fill for new/replacement structure foundations • Cut/fill for access and work envelopes

Resource Area	Impacts
Waterways	Waterways crossings do not involve structures within the waterways, only temporary access for construction. No adverse impacts are anticipated from waterways crossings.
Rare Species Impacts	Rare species may have potential impacts where construction-related activities occur within designated habitat. A “take” has the potential to occur due to access improvement activities, consultations with Natural Heritage and Endangered Species Program (“NHESP”) are in progress to identify areas of concern, and to identify appropriate avoidance measures for implementation, as required.
Historical/ Archaeological Impacts	Historical/Archaeological areas may have potential impacts where construction -related activities occur within areas of high archaeological sensitivity. Surveys are ongoing to identify areas of concern, and to identify appropriate avoidance measures for implementation, as required.

Note: Impacts located within the limits of RA overlap with impacts to BLSF, BVW, and the 100-foot Buffer Zone. Therefore, the total impacts are not equal to the sum of alterations.

1 This value includes the conversion of vegetated types (e.g., trees) to other vegetated types (e.g., shrubs).

2 In most cases, construction mat crossing will span the banks of rivers and streams; however, the potential for impact has been accounted for in total linear ft.

3 The existing canopy cover to be removed as a result of the conversion of vegetative cover types within the ROW does not result in a direct impact to LUW.

Describe the on-site project alternatives (and alternative off-site locations, if applicable), considered by the proponent, including at least one feasible alternative that is allowed under current zoning, and the reasons(s) that they were not selected as the preferred alternative:

NOTE: The purpose of the alternatives analysis is to consider what effect changing the parameters and/or siting of a project, or components thereof, will have on the environment, keeping in mind that the objective of the MEPA review process is to avoid or minimize damage to the environment to the greatest extent feasible. Examples of alternative projects include alternative site locations, alternative site uses, and alternative site configurations.

No-Build Alternative:

Under the No-Build Alternative, the Lines would remain in place and NEP would not execute a capital project to address performance issues and physical issues on the Lines or the need for increased fiber optic capability. NEP would continue to address line components that are imminently about to fail on an ad hoc basis, as it does with all its transmission assets. Accordingly, the NEP would repair or replace structures on an as-needed basis to address deterioration.

The Lines are experiencing poor performance, are in deteriorating condition, have inherent design issues and will have insufficient capacity to meet anticipated future needs. While repairing and replacing structures on an as-needed basis would address physical issues on individual structures, it would not address the inherent design issues that affect the entire line. Further, because OPGW cannot be added to the existing Lines, the No-Build Alternative would not provide fiber optic capability that would improve communications between substations. In short, the Lines should be rebuilt to improve their performance and reliability. Because the No-Build Alternative would not meet the identified need, it was eliminated from further consideration.

Partial Rebuild Alternatives

NEP considered two Partial Rebuild Alternatives, one with minimal work and one with more

extensive work. The Partial Rebuild Alternatives are targeted structure repair programs that would address the most pressing concerns regarding the deteriorating structures. Under the minimal work alternative, NEP would repair twenty lattice towers with deflecting or damaged components and replace one lattice tower that is leaning. NEP also would update grounding on five lattice towers and complete routine structure maintenance on lattice towers and routine foundation maintenance on both the lattice towers and steel pole structures. Under a more extensive Partial Rebuild Alternative, NEP would also replace ten wood pole structures with steel structures.

Targeted repair programs like the Partial Rebuild Alternatives can be low-cost, low-impact strategies for extending the life of transmission lines if the primary issue is a limited number of damaged structures. However, this approach is not a reasonable alternative for the Project because it would leave all, or the majority of existing structures in place and, therefore, would not address the underlying reliability issues associated with the inherent design issues (i.e., poor shielding angle and inadequate conductor spacing). Given that the original structures would mostly be retained rather than replaced, the Partial Rebuild Alternatives would not reduce the incidence of line outages associated with lightning strikes, downed trees, thunderstorms, and avian interference. Even under the more extensive Partial Rebuild Alternative, reliability improvements would be limited because these individual replacement structures would need to be physically consistent with the existing towers, which would remain unimproved. Because these alternatives do not address the key structure design issues associated with the poor reliability of the Lines nor meet the other identified needs, they were dismissed from further consideration.

Complete Rebuild Alternative (the Project)

The Project involves rebuilding the Lines and Tap Lines within their current ROWs by replacing all structures, conductors, and shield wires. This includes installing new steel monopole structures with either direct-buried foundations or micro pile foundations and all dead end or angle structures will be supported by drilled shaft foundations, installing new, davit arm, steel monopole structures, on the Lines and Tap Lines and thereafter removing the existing 538 lattice towers, 75 steel poles, and 98 wood poles, and replacing the conductor with larger aluminum conductors and two new OPGWs.

Upgrades include installing flyover switches, performing vegetation management, upgrading existing, and creating new access. These improvements address reliability issues by correcting poor shielding angles, reducing outages from lightning and tree strikes, and discouraging bird nesting. The new 795 MCM ACSS conductor will increase thermal capacity by 27%, support future distributed energy resource (“DER”) interconnections, and accommodate load growth. Dual OPGWs will enhance fault protection and enable high-speed substation communication, ensuring the Lines are more reliable, resilient, and capable of meeting future needs.

The Complete Rebuild Alternative is the only alternative that will address the Projects needs for improved performance of the Lines and Tap Lines by addressing all of the issues and provide the additional thermal capacity and voltage support required to support future load growth. Replacing the existing structures with taller structures will correct the poor shielding angle and avoid many of the outages caused by lightning. In addition, the new, taller monopole structures will reduce opportunities for trees striking the line and for bird nesting. Taken together, these design changes will significantly reduce the frequency of outages on the Lines and increase their reliability. In addition, access improvements will improve NEP’s ability to quickly repair damage to the lines when an outage does occur. Accordingly, NEP

selected it and dismissed other alternatives from further consideration.

69 kV and 115 kV Design Alternatives

NEP has established design criteria for its transmission lines to assure acceptable reliability of its bulk transmission system facilities. These criteria apply to conductors, structures, and equipment and establish insulation levels and required clearances for various voltage transmission lines. For this Project, NEP evaluated the 69 kV and the 115 kV Design options. NEP evaluated reliability, environmental and cost considerations of constructing the E5/F6 Lines and Taps to 115 kV Design standards. The 69 kV and 115 kV Designs both address the design issues associated with the poor performance record of the Existing Lines. Notably, however, construction of the E5/F6 Lines and Taps to the 115 kV Design standard, even if operated at 69 kV, will provide both near-term and longer-term transmission system reliability benefits that the 69 kV Design would not.

Reliability Comparison

The 69 kV and 115 kV Designs both address the design issues associated with the poor performance record of the Existing Lines. In particular, the replacement structures under either design would have an approximately 15 degree shielding angle, consistent with the current industry practice of limiting the shielding angle to 30 degrees or less. Similarly, the higher elevation of the conductors on the Rebuilt Lines will reduce the probability of faults resulting from off-ROW vegetation striking the energized lines. In addition, the change in structure type from lattice towers to monopole structures will reduce the potential for avian-related outages. Birds are prone to use horizontal members on the existing lattice towers to construct nests, which results in greater opportunity for avian interaction to create momentary outages on the circuits. Overall, either design will result in significant improvements in line performance.

Notably, however, construction of the Lines and Taps to the 115 kV Design standard, even if operated at 69 kV, will provide both near-term and longer-term transmission system reliability benefits that the 69 kV Design would not.

Environmental Comparison

NEP anticipates that the environmental impacts of the Project, using the 115 kV Design—which include temporary and permanent impacts to wetlands and water resources, vegetation management and removal, access improvements, visual impacts from the proposed increase in structure heights, as well as construction noise and traffic—would not be significantly reduced with the 69 kV Design. Tree removal requirements are primarily dictated by the line voltage, and distance between the lines and the edge of ROW;[8] however, NEP considers additional construction constraints when determining tree removal requirements. The same construction techniques would be used and, as a result, construction-related impacts, including vegetative removal, access improvements, wetlands and water resource impacts, and construction noise and traffic, would be similar or identical. Although there would be an approximately five to ten-foot difference in structure height, visual impacts from the new structures will be minimal in either case. NEP anticipates that use of the 69 kV Design would not significantly reduce any impacts.

The use of the 115 kV Design for the Project also obviates the possible need to construct a new 115 kV line when reliability needs call for additional capacity. Using the 69 kV Design for the E5/F6 Line now would require the future construction of a new line using the 115 kV

8 In accordance with NERC regulations, high voltage transmission lines, such as 115 kV, are allowed the least amount of risk of interruptions from danger trees.

Design, including replacement of all structures. This would require a re-mobilization and significant redundant construction efforts, which would place a repeat burden on the abutters along this ROW, as well as create an approximate doubling of environmental impacts.

Summarize the mitigation measures proposed to offset the impacts of the preferred alternative:

NEP follows a set of policies for ROW access, maintenance, and construction BMPs. By consistently implementing these procedures, NEP ensures that transmission lines are maintained and constructed by trained personnel in a manner that minimizes potential impacts to the environment, adheres to permit conditions, and meets industry standards. Key elements of the construction policy include pre-construction field investigations, field inspections during construction, and post-construction inspections.

Throughout construction, appropriate consideration will be given to Project implementation in a manner consistent with conditions of permits/authorizations and approved mitigation measures. To minimize Project impacts, NEP has incorporated the following actions and considerations throughout planning and design:

- Several asset condition and reliability needs were combined into one Project scope in an effort to reduce the need for repeat disturbances to wetlands and adjacent property owners in this shared ROW;
- Existing ROW and access are being used to avoid new land disturbance, where feasible;
- Field investigations were completed to assess constructability and avoid/mitigate sensitive resources;
- Agency consultations are in progress;
- Replacement structures are being located outside of BVWs, where feasible; and
- Temporary construction mat BMPs will be utilized to minimize wetland impacts.

Temporary work areas, including work envelopes and specified access modifications, will be restored to pre-construction conditions at the conclusion of construction activities.

Additional mitigation measures will be implemented as required by federal, state, and local requirements. NEP anticipates that the final mitigation package will be developed during the permitting processes outlined in the next section, and that the package will fully address the required permit conditions and agency concerns. Further information on the mitigation package will be provided in the DEIR. NEP anticipates that mitigation will demonstrate no net loss of existing wetland functions, values, and statutory interests within the watersheds.

If the project is proposed to be constructed in phases, please describe each phase:

The Project is not proposed to be constructed in phases.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN:

Is the project within or adjacent to an Area of Critical Environmental Concern?

☐ Yes (Specify_____) ☒ No

If yes, does the ACEC have an approved Resource Management Plan? __ Yes **__** No;
If yes, describe how the project complies with this plan. _____

Will there be stormwater runoff or discharge to the designated ACEC? __ Yes **__** No;
If yes, describe and assess the potential impacts of such stormwater runoff/discharge to the designated ACEC. _____

RARE SPECIES:

Does the project site include Estimated and/or Priority Habitat of State-Listed Rare Species? (see http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/priority_habitat/priority_habitat_home.htm)

☒ Yes (Specify: PH 1160, PH 1153, PH 1140, PH 1167, PH 1166, PH 1356, PH 1335, PH 1224, PH 1488, PH 1475, PH 2084, PH 1623, PH 1741, PH 1731, PH 1743, PH 1799, PH 1796, and PH 1798, EH 845, EH 839, EH 830, EH 839, EH 845) ☐ No

Three bird, three reptile, one amphibian, five invertebrate, one fish, and 13 plant species are mapped along portions of the Project route in Spencer, East Brookfield, North Brookfield, West Brookfield, Ware, Belchertown, Shutesbury, Leverett, Sunderland, Deerfield, Conway, and Shelburne. The names and locations of these species are not provided, as requested by Natural Heritage and Endangered Species Program ("NHESP").

HISTORICAL/ARCHAEOLOGICAL RESOURCES:

Does the project site include any structure, site or district listed in the State Register of Historic Place or the inventory of Historic and Archaeological Assets of the Commonwealth?

☒ Yes (Specify AUB.B, AUB.C, AUB.D, AUB.E, AUB.F, BLC.H, BLC.J, BUC.F, BUC.163, DEE.A, LEV.A, LEV.B, MLB.M, MLB.U, SHL.A, SHL.B, SHL.C, SPE.A, SUN.A, WAR.M, and WBK.D.) ☐ No

NEP has conducted a cultural resources due diligence and sensitivity assessment, and is conducting an archeological survey and historic architectural properties assessment, under a permit issued by the MHC. See below for inventoried districts:

- Auburn Center, Auburn (AUB.B)
- Pondville, Auburn (AUB.C)
- West Auburn, Auburn (AUB.D)
- Stoneville, Auburn (AUB.E)
- Drury Square, Auburn (AUB.F)
- Quabbin Reservoir Administration Complex, Belchertown (BLC.H)
- Blue Meadow Road, Belchertown (Quabbin Reservoir Worker Housing) (BLC.J)
- Deerfield River Hydroelectric Development #3, Buckland (BUC.F)
- Development #3 Hydroelectric Powerhouse, Buckland (BUC.163)
- Gunn-Sadoski Farm (Pine Nook), Deerfield (DEE.A)
- Leverett Center Historic District, Leverett (LEV.A)
- East Leverett, Leverett (LEV.B)
- South Main Street Area, Millbury (MLB.M)
- Blackstone Canal Historic District, Millbury (MLB.U)
- Development #2 Hydroelectric Power Facility, Shelburne (SHL.C)
- Development #3 Hydroelectric Power Facility, Shelburne (SHL.B)
- Development #4 Hydroelectric Power Facility, Shelburne (SHL.A)
- Main Street Area, Spencer (SPE.A)

- Whitmore's Mills, Sunderland (SUN.A)
- Quabbin Reservoir, Ware (WAR.M)
- Wickaboag Valley Road Historic Area, West Brookfield (WBK.D)

If yes, does the project involve any demolition or destruction of any listed or inventoried historic or archaeological resources? ☐ Yes (Specify_____) ☒ No

WATER RESOURCES:

Is there an Outstanding Resource Water (ORW) on or within a half-mile radius of the project site? X Yes __ No;
If yes, identify the ORW and its location:

(NOTE: Outstanding Resource Waters include Class A public water supplies, their tributaries, and bordering wetlands; active and inactive reservoirs approved by MassDEP; certain waters within Areas of Critical Environmental Concern, and certified vernal pools. Outstanding resource waters are listed in the Surface Water Quality Standards, 314 CMR 4.00.)

Table 6: Outstanding Resource Waters Within 0.5 Miles of the Project ROW

Outstanding Resource Waters ("ORW")	Location
Henshaw Pond	Leicester, MA
Amethyst Brook	Amherst, MA
Ludlow Reservoir	Ludlow, MA
Atkins Reservoir	Shutesbury, MA
Quabbin Reservoir	Worcester County, MA

Source: Massachusetts Geographic Information Systems ("MassGIS"), Outstanding Resource Waters data layer. 2010.

Approximately 52 Certified Vernal Pools ("CVPs") are located within a 0.5-mile radius of the ROW in Auburn, Belchertown, Deerfield, Leverett, North Brookfield, Pelham, Shutesbury, Spencer, Sunderland, Ware, and West Brookfield. There are 22 Confirmed Vernal Pools ("VPs") within or immediately adjacent to the Project ROW by field evaluation, 10 of which are Certified by NHESP.

Are there any impaired water bodies on or within a half-mile radius of the project site?
_X_ Yes __ No; **If yes, identify the water body and pollutant(s) causing the impairment:**

Table 7: Impaired Water Bodies Within 0.5 Miles of the Project ROW

Waterbody	Watershed	Water Type Category	Category # & Classification	Pollutant Causing Impairment	TMDL Count
Brookhaven Lake	Chicopee	Freshwater Lake	5 Impaired – TMDL Required	Turbidity	0
Dark Brook Reservoir	Blackstone	Freshwater Lake	4C Impairment Not Caused by a Pollutant	N/A	0
Pondville Pond	Blackstone	Freshwater Lake	4A Impaired – TMDL Completed	Algae	1
Knights Pond	Chicopee	Freshwater Lake	3 No Uses Assessed	N/A	0
Woolshop Pond	Blackstone	Freshwater Lake	5 Impaired – TMDL Required	Aquatic Plants (Macrophytes)	0
Peppers Mill Pond	Chicopee	Freshwater Lake	3 No Uses Assessed	N/A	0
Slaughterhouse Pond	Blackstone	Freshwater Lake	3 No Uses Assessed	N/A	0
Hathaway Pond	Blackstone	Freshwater Lake	3 No Uses Assessed	N/A	0
Henshaw Pond	French	Freshwater Lake	3 No Uses Assessed	N/A	0
Cedar Meadow Pond	French	Freshwater Lake	4C Impairment Not Caused by a Pollutant	N/A	0
Bouchard Pond	French	Freshwater Lake	4C Impairment Not Caused by a Pollutant	N/A	0
Stiles Reservoir	French	Freshwater Lake	3 No Uses Assessed	N/A	0
Lake Lashaway	Chicopee	Freshwater Lake	4A Impaired – TMDL Completed	N/A	1
Quabbin Reservoir	Chicopee	Freshwater Lake	4A Impaired – TMDL Completed	N/A	1
Stoneville Reservoir	Blackstone	Freshwater Lake	3 No Uses Assessed	N/A	0
Atkins Reservoir	Connecticut	Freshwater Lake	5 Impaired – TMDL Required	N/A	0
Leverett Pond	Connecticut	Freshwater Lake	4A Impaired – TMDL Completed	Eurasian Water Milfoil, (*Myriophyllum spicatum)*	1

Source: Massachusetts Department of Environmental Protection ("MassDEP"), 2022 Integrated List of Waters (305(b)/303(d)).

Notes: Total Maximum Daily Load ("TMDL")

Is the project within a medium or high stress basin, as established by the Massachusetts Water Resources Commission? _X_ Yes __ No;

STORMWATER MANAGEMENT:

Generally, describe the project's stormwater impacts and measures that the project will take to comply with the standards found in MassDEP's Stormwater Management Regulations:

NEP will employ construction-phase BMPs for stormwater management including sediment and erosion controls. Additionally, during the construction of the Project, NEP will construct stormwater management features such as swales, water bars, plunge pools, and/or check dams. These stormwater management features will promote stability of the constructed access improvements, reducing the potential for significant erosion and/or washout, and protecting sensitive resource areas. NEP will prepare a Stormwater Report to document compliance with the Massachusetts Stormwater Management Standards.

In addition, NEP will prepare a Stormwater Pollution Prevention Plan ("SWPPP") for the Project in compliance with the U.S. Environmental Protection Agency's ("EPA's") National Pollutant Discharge Elimination System ("NPDES") program under the Stormwater Construction General Permit. The SWPPP establishes a construction period contact list, presents a description of the proposed work, and identifies stormwater controls, spill prevention, and inspection practices to be implemented for the management of construction-related stormwater discharges from the Project. The SWPPP clearly identifies parties responsible for monitoring and reporting any activities out of compliance with the SWPPP or other environmental permits or approvals, and for handling extraordinary situations. The SWPPP also defines monitoring to occur until all disturbed areas on the site have been stabilized using standard BMPs. In this manner, the potential impacts associated with land disturbance (e.g., erosion and sedimentation) will be proactively managed so that impacts can be avoided.

MASSACHUSETTS CONTINGENCY PLAN:

Has the project site been, or is it currently being, regulated under M.G.L.c.21E or the Massachusetts Contingency Plan? _X_ Yes ___ No;

If yes, please describe the current status of the site (including Release Tracking Number (RTN), cleanup phase, and Response Action Outcome classification):

Table 8: Proximal Sites Under M.G.L. c.21E of the Massachusetts Contingency Plan

Release Tracking Number ("RTN")	City/Town	Address	Site Name	Compliance	Response Action Outcome ("RAO") Class*
2-0018190	Spencer	8 Meadow Road	Meadow Road and Olde Main	Downgradient Property Status ("DPS")	
2-0017396	Spencer	18 Olde Main St	Gobis Auto Service	TIERI	
2-0016701	Spencer	89 Smithville Rd	Zukus Farm Road	RAO	A2
2-0015795	Auburn	26 Millbury St	Worcester Envelope	RAO	A1

Release Tracking Number ("RTN")	City/Town	Address	Site Name	Compliance	Response Action Outcome ("RAO") Class*
2-0000016	Auburn	314 Washington St	Colony Press Fmr	Massachusetts Department of Environmental Protection ("MassDEP") No Further Action	
2-0019062	West Brookfield	46 Madden Rd Unit 37 Millbrook Cir	Madden Estates	Permanent Solution with No Conditions	PN
1-0017040	Shutesbury	491 Pratts Corner Rd	National Grid Substation	RAO	A1
1-0018465	Shelburne	232 Main Street, Route 112	Deerfield No. 4 Switchyard	RAO	A2
1-0017655	Shelburne	244 Main St	Wmeco Substation 29r	RAO	A2
2-0022315	Millbury	27 Providence Street	Commercial Property	Unclassified	
2-0017792	Millbury	137 North Providence	Town Of Millbury Highway Garage	RAO	A2
2-0015935	Millbury	58 Elmwood St	Shaw Elementary School	RAO	A2
2-0014362	Millbury	50 Grafton St	Millbury Substation No. 2	RAO	B1
2-0014312	Millbury	33 Providence St	Substation	RTN Closed	
2-0014039	Millbury	50 Grafton St	Millbury Substation No. 4	RAO	B1
2-0013614	Millbury	50 Grafton St	MECO Substation No. 2	RAO	A2
2-0012306	Millbury	33 Providence St	Substation	RAO	A2
2-0011459	Millbury	33 Providence St	Massachusetts Electric Substation	RAO	A3
2-0000958	Millbury	Providence Rd	Millbury Substation No. 1	RAO	A3
2-0014166	Millbury	33 Providence Rd	MECO Millbury Substation No. 1	RAO	A3
1-0010805	Belchertown	Blue Meadow Rd	Quabbin Reservoir	RAO	A1

Source: Massachusetts Department of Environmental Protection ("MassDEP"), Oil and/or Hazardous Material Sites.

Note: For Class A-1 RAOs, contamination has been cleaned up to background levels. At sites with Class A-2 RAOs, contamination may be above background levels but below Method 1 cleanup standards, or otherwise at "No Significant Risk." Similarly, sites with Class B-1 RAOs may have contaminant levels at background levels or may be below Method 1 Standards and/or otherwise at No Significant Risk. Class A-3, A-4, B-2 and B-3 RAOs are sites that are closed with Activity and Use Limitations ("AULs"). PN is the new designation indicating a Permanent Solution has been achieved with no conditions.

Is there an Activity and Use Limitation (AUL) on any portion of the project site?

_X_ Yes __ No;

If yes, describe which portion of the site and how the project will be consistent with the AUL:

Table 9: Activity and Use Limitations Within the Project ROW

Release Tracking Number ("RTN")	City/Town	Address	Site Name	Compliance	Response Action Outcome ("RAO")
2-0000958	Millbury	Providence Rd	Millbury Substation No.1	RAO	A3
2-0011459	Millbury	33 Providence St	Massachusetts Electric Substation	ROA	A3
2-0014166	Millbury	33 Providence Rd	MECO Millbury Substation No. 1	RAO	A3

Source: Massachusetts Department of Environmental Protection (MassDEP), Oil and/or Hazardous Material Sites with Activity and Use Limitations ("AUL") MassGIS layer. Updated December 4, 2024.

Based on the information available, it appears that work at structures 1A, 1, and potentially 2 will be conducted within the limits of the Activity and Use Limitations ("AUL") that has been filed for Release Tracking Numbers ("RTNs") 2-0000958, 2-0011459, and 2-0014166. The Project activities are not prohibited by the AUL and NEP will comply with the applicable conditions of the AUL governing soil management and disposal under the supervision of Licensed Site Professional.

Are you aware of any Reportable Conditions at the property that have not yet been assigned an RTN? Yes __ No _X_; **if yes, please describe:** _____

SOLID AND HAZARDOUS WASTE:

If the project will generate solid waste during demolition or construction, describe alternatives considered for re-use, recycling, and disposal of, e.g., asphalt, brick, concrete, gypsum, metal, wood:

(NOTE: Asphalt pavement, brick, concrete and metal are banned from disposal at Massachusetts landfills and waste combustion facilities and wood is banned from disposal at Massachusetts landfills. See 310 CMR 19.017 for the complete list of banned materials.)

The intent is for all existing wood and steel towers proposed for removal to be transported to an appropriate recycling facility. The removal and recycling will be consistent with all applicable regulations.

Will your project disturb asbestos containing materials? Yes __ No X ;

If yes, please consult state asbestos requirements at http://mass.gov/MassDEP/air/asbhom01.htm

NEP will comply with state laws regulating the use of diesel-powered equipment and vehicle idling times during construction. NEP will also take measures to limit vehicle idling times and to reduce air emissions, including the following:

- Any diesel-powered non-road construction equipment with engine horsepower ratings of 50 and above to be used for 30 or more days over the course of construction will either be EPA-Tier 4-compliant or will be retrofitted with EPA-verified (or equivalent) emission control devices such as oxidation catalysts or other comparable technologies (to the extent that they are commercially available) and installed on the exhaust system side of the diesel combustion engine.
- NEP requires the use of ultra-low sulfur diesel fuel in its diesel-powered construction equipment and limits idling time to five minutes except when engine power is necessary for the delivery of materials or to operate accessories to the vehicle such as power lifts.
- Vehicle idling is to be minimized during construction activities, in compliance with Massachusetts Anti-idling Law, G.L. c. 90 § 16A, c. 111 §§ 142A – 142M, and 310 CMR 7.11.

DESIGNATED WILD AND SCENIC RIVER:

Is this project site located wholly or partially within a defined river corridor of a federally designated Wild and Scenic River or a state designated Scenic River?

Yes ___ No X ; **If yes, specify name of river and designation:**

If yes, does the project have the potential to impact any of the "outstandingly remarkable" resources of a federally Wild and Scenic River or the stated purpose of a state designated Scenic River? Yes ___ No ___;

If yes, specify name of river and designation: _____;

If yes, will the project will result in any impacts to any of the designated "outstandingly remarkable" resources of the Wild and Scenic River or the stated purposes of a Scenic River. Yes ___ No ___;

If yes, describe the potential impacts to one or more of the "outstandingly remarkable" resources or stated purposes and mitigation measures proposed.

ATTACHMENTS:

1. **List of all attachments to this document.**

   Refer to List Below

2. **U.S.G.S. map (good quality color copy, 8-½ x 11 inches or larger, at a scale of 1:24,000) indicating the project location and boundaries.**

   Refer to **Attachment A: Project Figures**

3. **Plan, at an appropriate scale, of existing conditions on the project site and its immediate environs, showing all known structures, roadways and parking lots, railroad rights-of-way, wetlands and water bodies, wooded areas, farmland, steep slopes, public open spaces, and major utilities.**

   Refer to **Attachment A: Project Figures**

4. **Plan, at an appropriate scale, depicting environmental constraints on or adjacent to the project site such as Priority and/or Estimated Habitat of state-listed rare species, Areas of Critical Environmental Concern, Chapter 91 jurisdictional areas, Article 97 lands, wetland resource area delineations, water supply protection areas, and historic resources and/or districts.**

   Refer to **Attachment A: Project Figures**

5. **Plan, at an appropriate scale, of proposed conditions upon completion of project (if construction of the project is proposed to be phased, there should be a site plan showing condition upon the completion of each phase).**

   Refer to **Attachment A: Project Figures**

6. **List of all agencies and persons to whom the proponent circulated the ENF, in accordance with 301 CMR 11.16(2).**

   Refer to **Attachment B: ENF Distribution List**

7. **List of municipal and federal permits and reviews required by the project, as applicable.**

   Refer to **Attachment E for a list of federal, state, and municipal permits and reviews required by the Project.**

8. **Printout of output report from RMAT Climate Resilience Design Standards Tool, available here.**

   Refer to **Attachment C: RMAT**

9. **Printout from the EEA EJ Maps Viewer showing the project location relative to Environmental Justice ("EJ") Populations located in whole or in part within a 1-mile and 5-mile radius of the project site.**

   Refer to **Attachment D: Environmental Justice**

LAND SECTION – all proponents must fill out this section

I. Thresholds / Permits

A. Does the project meet or exceed any review thresholds related to land (see 301 CMR 11.03(1) _X_ Yes __No; **If yes, specify each threshold:**

Direct alteration of 50 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or similar. (301 CMR 11.03(1)(a)).

Approximately 561 acres of permanent alteration is proposed, which includes conversion of vegetative cover types, temporary construction matting, permanent and temporary work and pull pad areas, and access improvements.

II. Impacts and Permits

A. Describe, in acres, the current and proposed character of the project site, as follows:

	Existing	Change	Total
Footprint of buildings	N/A	N/A	N/A
Internal roadways	N/A	N/A	N/A
Parking and other paved areas	N/A	N/A	N/A
Other altered areas	1,125 acres	561 acres	1,125 acres
Undeveloped areas	N/A	N/A	N/A
Total: Project Site Acreage	1,125 acres	561 acres	1,125 acres

B. Has any part of the project site been in active agricultural use in the last five years? _X_ Yes __No; **If yes, how many acres of land in agricultural use (with prime state or locally important agricultural soils) will be converted to nonagricultural use?**

No land in agricultural use will be converted to nonagricultural use.

C. Is any part of the project site currently or proposed to be in active forestry use? _X_ Yes ___ No; **If yes, please describe current and proposed forestry activities and indicate whether any part of the site is the subject of a forest management plan approved by the Department of Conservation and Recreation:**

The Project ROW transects four areas in active forestry use (see **Table 10** below). In all cases, Project activities are within NEP's easements (an active transmission line ROW), which are not currently, nor in the future, managed for forestry activities.

Table 10: Active Forestry Areas Transected by the Project ROW

Name	Municipality	Structure Numbers (existing)
Buffam Brook Community Forest	Pelham	413 - 416; 418 - 422
Cadwell Memorial Forest	Pelham	387 - 397
South River State Forest	Conway	562 - 586; 589 - 595
Amherst Watershed	Pelham	401- 412

The Buffam Brook Community Forest follows the Forest Stewardship Plan (approved in November 2017), which prioritizes sustainable forest management through selective timber harvest and promotes late-successional forest conditions. Riparian zones and rare species habitat are managed particularly sensitively, and invasive plant control and public access are also strongly emphasized. Collaborations with organizations like the Kestrel Land Trust, Hitchcock Center, and the University of Massachusetts ("UMass"), create opportunities for forest-based experiential learning and stewardship education.[9] Proposed Project activities, which will be located within the existing and historically managed ROW, will not interfere with the wider uses of the Buffam Brook Community Forest for wildlife, public recreation, water quality, and sustainable timber harvests.

The Cadwell Memorial Forest covers an area of 1,950 acres and is owned by UMass Amherst. The site is a secondary growth mixed hardwood forest, in an area originally cleared for pasture. Since 1952, the site has functioned as an outdoor laboratory for ecology, forestry, and natural resources management. Forest management prioritizes sustainable timber practices, biodiversity enhancement, research, and public engagement, as well as public recreation via numerous trails.[10] Project activities will not impact these functions and will not impair public access to the forest.

The South River State Forest is managed under a 2014 Forest Management Proposal and vegetation management plan, overseen by DCR and the Bureau of Forest Fire Control and Forestry. Forest management prioritizes sustainability through the application of different management techniques for different forest types, with a focus on biodiversity and forest health[11]. Project activities will not impact the functions and values of the South River State Forest, nor impact biodiversity or tree health outside of the managed Project ROW.

The Amherst Watershed is managed under the Town of Amherst's Watershed Management Plan, which aims to ensure the sustainable management of the 2,662-acre forested area. Management strategies are tailored to different forest cover types and to different habitats (including wetlands and tributaries). Measures such as selective harvesting and thinning are employed to enhance forest quality, preserve wildlife values, and maintain scenic landscapes. Management prioritizes water quality, wildlife habitat, and passive recreational activities.[12] Project activities within the managed ROW will not impact the careful management of the wider Amherst Watershed and will employ BMPs to ensure protection of sensitive wetland resource areas, streams, and tributaries.

9 *Buffam Brook Community Forest Stewardship Plan* (Pelham, MA: Town of Pelham Conservation Commission, Kestrel Land Trust, MA Department of Conservation & Recreation, and U.S. Forest Service Open Space and Community Forest Program, November 2017).

10 Anthony D'Amato et al., *Cadwell Forest Management Plan* (Amherst, MA: Department of Natural Resources Conservation, University of Massachusetts Amherst, n.d.).

11 Massachusetts Department of Conservation and Recreation, Bureau of Forest Fire Control and Forestry, *Forest Management Proposal: South River 2014* (Pittsfield, MA: Massachusetts Department of Conservation and Recreation, January 21, 2015).

12 Conservation Department, Watershed Management Plan, accessed [12/11/2024], https://www.amherstma.gov/1259/Watershed-Management-Plan.

D. Does any part of the project involve conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97? __ Yes X No; **If yes, describe:**

E. Is any part of the project site currently subject to a conservation restriction, preservation restriction, agricultural preservation restriction or watershed preservation restriction? X Yes __ No; **If yes, does the project involve the release or modification of such restriction?** __ Yes X No; **If yes, describe:**

F. Does the project require approval of a new urban redevelopment project or a fundamental change in an existing urban redevelopment project under M.G.L.c.121A? __ Yes X No; **If yes, describe:**

G. Does the project require approval of a new urban renewal plan or a major modification of an existing urban renewal plan under M.G.L.c.121B?

__ Yes X No; **If yes, describe:**

III. Consistency

A. Identify the current municipal comprehensive land use plan

Title: See Below **Date:** See Below

The current municipal comprehensive land use plans are:

- Millbury, Massachusetts (Town of Millbury Comprehensive Master Plan - 2019)
- Auburn, Massachusetts (Master Plan - 2019)
- Spencer, Massachusetts (Spencer, Massachusetts Community Master Plan - 2003)
- East Brookfield, Massachusetts (East Brookfield Massachusetts 2008 Community Master Plan)
- North Brookfield, Massachusetts (Master Plan Town of North Brookfield - 2022)
- West Brookfield, Massachusetts (West Brookfield Master Plan - 2017)
- Ware, Massachusetts (A Window to Ware's Future – The 2016 Master Plan)
- Belchertown, Massachusetts (Belchertown Community Plan - 2023)
- Pelham, Massachusetts (Pelham Master Plan Studio - 2017)
- Shutesbury, Massachusetts (Shutesbury Master Plan - 2004)
- Deerfield, Massachusetts (Deerfield Master Plan - 2000)

The Towns of Leicester, Sunderland, Leverett, Conway and Shelburne do not have comprehensive plans, and therefore, are not cited.

B. Describe the project's consistency with that plan with regard to:

1) economic development See below
2) adequacy of infrastructure See below
3) open space impacts See below
4) compatibility with adjacent land uses See below

The Project proposes construction on NEP-owned lands or easements and within an existing transmission line ROW, and necessary measures to ensure no damage to natural, historical,

and open space resources. Therefore, it is not anticipated that the Project will have any impact on land use, open space, economic development, housing, historic and cultural resources, transportation and circulation, service and facilities, recreation, community health, and well-being. The proposed refurbishment and upgrades to the Lines will improve regional system electrical reliability, promoting economic development while minimizing environmental and land use impacts. As such, the Project supports the overall goals of all municipal land use plans, as discussed below.

Town of Millbury

The Town of Millbury's Comprehensive Master Plan (the "Plan") outlines the Town's specific plans for Land Use and Zoning, Community Facilities and Housing, Economic Development, Historic and Scenic Resources, Transportation, Capital Improvement, and Recreation. A review of the Plan's economic development, land use, and open space goals has concluded that the Project and its impacts are compatible with the Plan. In particular, one of the major economic goals in the Plan is to build robust infrastructure to bolster local industries – something which the refurbishment and improvement of the E5/F6 Lines will directly support. By utilizing the existing ROW and refurbishing existing structures, the proposed Project conforms with the Plan's land use and open space goals, minimizing the footprint of new developments and preserving landscapes. The Project also contributes to the Plan's land use goals of sustainable growth and development, promoting electrification of the grid, while minimizing new impacts to land use.

Town of Auburn

The Town of Auburn's Master Plan (the "Plan") outlines the Town's specific plans for land use, facilities and services, housing and population, economic development, open space and recreation, transportation, and natural cultural and historic resources. Review of the Plan's Economic goals, as well as the Town's Energy Efficiency & Climate Resiliency goals, has concluded that the Project and its impacts are compatible with the Plan. Specifically, the improved electrical reliability provided by the Project will contribute to the Town's plans to redevelop modern office space and create resilient infrastructure that supports contemporary office spaces and businesses. Rebuilding the E5/F6 Lines will not only improve reliability for existing customers, but will enable the connection of more electrical customers, fostering an environment where additional businesses and industries can thrive. By performing the line refurbishment within the existing ROW (rather than constructing a new transmission line), the Project conforms with Auburn's municipal facility operations and infrastructure management goals. The Project will also contribute to the Plan's Energy Efficiency & Climate Resiliency goals - replacing existing structures with more resilient steel structures, increasing line capacity, and performing conductor upgrades, will all enhance energy efficiency and reduce environmental impacts.

Town of Spencer

The Town of Spencer's Master Plan (the "Plan") describes the Town's goals and policies, a brief town history, and goals relating to facilities and services, transportation network, housing, economic development, and land use and zoning. The proposed Project will contribute to improved electrical reliability and resilience, in a manner consistent with the goals of the Plan's Land Use and Zoning Chapter. Refurbishment of the E5/F6 Lines within its existing ROW aligns with the Plan's emphasis on rural preservation. By committing to necessary measures to prevent damage to natural, historical, and open space resources, the proposed Project contributes to infrastructure development that respects the town's

character.

Town of North Brookfield

The Town of North Brookfield's Master Plan (the "Plan") describes the Town's plans specific to government facilities and services, open space and recreation, and economic development. As described previously, the Project will contribute to these overall goals by improving electrical reliability and capacity (supporting economic development within the Town), while minimizing impacts to open space and recreation (by rebuilding the transmission line within its existing ROW).

Town of East Brookfield

The Town of East Brookfield's Community Master Plan (the "Plan") describes the Town's plans specific to population and housing, land use, economic development, open space and recreation natural, cultural, and historic resources, transportation, and town facilities and services. By investing in critical infrastructure, and improving electrical reliability and resilience, the Project contributes to the enhancement of the local economy as outlined in the Economic Development Chapter of the Plan. Impacts to open space and recreation, and the Town's natural, cultural, and historic resources, will be minimized by re-using the existing ROW, and through the use of appropriate BMPs and restoration measures before and after construction. No impacts to overall community health and well-being are anticipated.

Town of West Brookfield

The Town of West Brookfield's Community Master Plan (the "Plan") describes the Town's plans specific to population and housing, land use, economic development, open space and recreation, natural, cultural, and historic resources, transportation, and town facilities and services. By investing in critical infrastructure, and improving electrical reliability and resilience, the Project contributes to the economic development goals outlined in the Plan. While the Project is not directly tied to light industrial opportunities and development (a key interest outlined in the Plan), it will support these developments by ensuring a reliable and efficient energy supply. Impacts to open space and recreation, and the Town's natural, cultural, and historic resources, will be minimized by re-using the existing ROW, and through the use of appropriate BMPs and restoration measures before and after construction. No impacts to overall community health and well-being are anticipated.

Town of Ware

The Town of Ware's Master Plan (the "Plan") includes the visions and aspirations, a snapshot of Ware, concerns, issues, and recommendations. The proposed Project aligns with the Plan's vision for the adequacy of infrastructure. Refurbishment of the E5/F6 Lines will contribute to making Ware more attractive for investment, by ensuring the Town is serviced with robust and reliable energy infrastructure. While the Project does not directly address all aspects mentioned in the Plan (such as sewer lines, transit, streets, and sidewalks), it underscores the commitment to critical infrastructure improvements. The Project aligns with the broader Plan goal of enhancing infrastructure, making Ware an appealing destination for economic development and potential investors.

Town of Belchertown

Belchertown's Community Plan (the "Plan") describes the Town's goals and policies, and plans for land use, housing, economic development, natural and cultural resources, open space and recreation, services and facilities, circulation, and implementation. The proposed

Project aligns with the Plan's commitment to enhancing the adequacy of infrastructure, particularly in addressing the impact of power outages. By rebuilding and modernizing the E5/F6 Lines, the Project contributes to the reliability and resilience of the energy infrastructure serving Belchertown, ensuring a more robust and consistent power supply for the community.

Town of Shutesbury

The Town of Shutesbury's Master Plan (the "Plan") describes the Town's plans for natural resources and open space, economic development, housing, community facilities and services, transportation, historic and scenic resources, and land use and zoning. The proposed Project aligns with the Plan's goal of exploring and promoting economic development that is compatible with the town's environment and rural character. Rebuilding the E5/F6 Lines within its existing ROW will provide improved electrical reliability and resilience, while minimizing impacts to the environment, open space, and historic and scenic character of the Town of Shutesbury. By taking necessary measures to prevent damage, the Project ensures the continuity of large blocks of contiguous forestland and open space, in harmony with the Shutesbury Master Plan's goal to preserve the rural character of the Town. The Project also contributes to the Plan's long-term objective of investing in alternative power sources (where suitable). The refurbishment of the E5/F6 Lines will contribute to the efficiency and resilience of vital electrical infrastructure, supporting green energy solutions that contribute to the grid and the Town revenues. Overall, the Project is consistent with the Plan's economic development goals by laying the foundation for sustainable growth and resilience.

Town of Pelham

The Town of Pelham's Master Plan (the "Plan") describes the Town's plans for economic development, housing, land use, open space and natural resources, creation, cultural and historic resources, community services and facilities, circulation, and transportation. As part of the Plan's Land Use Chapter goals, land use that favors residential spaces, open areas, and watershed protection is encouraged. In addition, development should aim to maintain the rural character of Pelham, while allowing for (limited) commercial and economic development in suitable areas. By providing essential upgrades to electrical infrastructure, the proposed Project will complement the Plan's economic development goals, providing reliable and resilient electrical supply to support commercial and domestic uses. Rebuilding the E5/F6 Lines within its existing ROW will minimize impacts to the environment, open space, and historic and rural character of Pelham.

Town of Deerfield

The Town of Deerfield's Master Plan (the "Plan") describes the Town's plans for farmland, open space and natural resources, community facilities and services, housing, historic and scenic resources, transportation resources, economic development, land use and zoning. The refurbishment of the E5/F6 Lines will help to ensure reliable and efficient energy infrastructure, supporting economic vitality, job retention, and employment opportunities within the Town of Deerfield. The Project's commitment to protecting historic character and minimizing impacts to agricultural land aligns with the Plan's vision for sustainable development. By utilizing the existing ROW and rebuilding existing structures, the Project reduces impacts to Deerfield's unique environment, demonstrating a consistent approach to economic development in step with the town's values and goals.

C. Identify the current Regional Policy Plan of the applicable Regional Planning Agency (RPA)

RPA: See Below

Title: See Below **Date:** See Below

D. Describe the project's consistency with that plan with regard to:

1) economic development See Below
2) adequacy of infrastructure See Below
3) open space impacts See Below

There are three Regional Policy Plans in operation over the length of the Project. The "2023 Central Massachusetts Infrastructure Plan" covers the Central Massachusetts Region (Towns of Millbury, Auburn, North Brookfield, West Brookfield, East Brookfield, Spencer, and Leicester). The "Pioneer Valley Plan for Progress (2015 - 2025)" covers the Pioneer Valley Region (Towns of Ware, Belchertown, and Pelham). Finally, the "Sustainable Franklin County: A Regional Plan for Sustainable Development" covers the Franklin Region (Towns of Sunderland, Leverett, Conway, Deerfield, and Shelburne). The Project's consistency with each Plan, in relation to economic development, infrastructure, and open space impacts, is discussed below.

Central Massachusetts Regional Planning Commission ("CMRPC"), *The 2023 Central Massachusetts Infrastructure Plan and the "Imagine 2050: A Vision for Central Massachusetts" initiative*

Millbury, Auburn, North Brookfield, West Brookfield, East Brookfield, Spencer, and Leicester

The "Imagine 2050: A Vision for Central Massachusetts" initiative (the "initiative"), led by CMRPC, outlines regional goals and strategies for the next 25 years. Central Massachusetts residents have voiced a need for more affordable housing, small businesses, and local food operations. Existing infrastructure has been highlighted as a challenge for potential developers, and the initiative stresses the need for investment in essential infrastructure, including electric infrastructure, for building a prosperous region. The Initiative also stresses that addressing the effects of climate change requires the creation of sustainable and resilient infrastructure. The proposed Project will address several of these concerns – the refurbishment of the E5/F6 Lines will directly contribute to improvements in energy infrastructure, and the new lines will be more reliable and able to meet higher electrical demand. By rebuilding the lines using new, more resilient steel structures (and higher capacity conductors), the system will be more resilient to the impacts of climate change, including increased flooding, storm frequency, and temperature extremes.

The Project also aligns with the Central Massachusetts Infrastructure Plan (the "Plan") goals of providing adequate energy infrastructure, and the Economic Implications of reaching Net-Zero. The refurbishment of the E5/F6 Lines signifies a dedicated effort to enhance electric grid capacity and resilience, directly addressing the Plan's objective to explore and invest in grid modernization strategies. This underscores a proactive stance toward infrastructure enhancement, in line with the Plan's vision for a more modern and robust electric grid, capable of meeting the region's present and future needs. By improving the reliability and capacity of the electric transmission system, the Project will also help to meet increasing adoption of electric heating and transportation, as anticipated by the Plan (and by NEP's own modelling of future trends in electric demand for the region). Upgrades to the E5/F6 Lines will

not only contribute to enhancing the grid's capacity and resilience, but also its flexibility in responding to challenges in energy storage and demand fluctuations caused by (for example), weather conditions or low renewable energy production. The Project's commitment to maintaining grid reliability through strategic improvements supports the broader economic implications outlined in the Plan, for a robust and adaptable energy system in the transition to Net-Zero.

The Project also aligns with the Plan's open space considerations. By rebuilding the E5/F6 Lines within the existing ROW (and by implementing appropriate BMPs to minimize impacts during and after construction), the Project has minimized land impacts, a key element in the Plan's focus on smart land use decisions and low impact development. By selecting the existing ROW, the Project effectively mitigates disruption to open spaces, reinforcing the overarching goal of achieving Net-Zero by avoiding unnecessary land use. This strategic approach complements the Plan's recommendation for reforestation projects on vacant and derelict land, acknowledging the value of open spaces and the environmental benefits they offer.

Pioneer Valley Planning Commission, *The Pioneer Valley Plan for Progress (2015-2025)*

Ware, Belchertown, and Pelham

The Pioneer Valley Plan for Progress (the “Plan”), describes the Pioneer Valley Region’s Plans specific for talent pool, thriving businesses, infrastructure, and economic development. In particular, the Project contributes to the infrastructure goal of the Plan, which focuses on “implementing and enhancing the infrastructure that sustains and ensures the safety and resiliency of the region and its economy”. The Project’s explicit aim is to improve the reliability and resilience of the E5/F6 Lines, in order to provide safe and reliable electrical service across the region. Additionally, the Project supports economic development across the region, by helping to ensure reliable and efficient energy supply. By rebuilding the E5/F6 Lines within the existing ROW, and by implementing appropriate BMPs throughout construction, the Project will contribute to the infrastructure and economic development goals of the Plan, while taking the necessary measures to prevent damage to natural, historical, and open space resources. In summary, the Project exemplifies a consistent and integrated approach to economic development, open space impacts, and the adequacy of infrastructure in alignment with regional goals.

Franklin Regional Council of Governments, *Sustainable Franklin County: A Regional Plan for Sustainable Development*

Sunderland, Leverett, Conway, Deerfield, and Shelburne

The Franklin County Regional Plan for Sustainable Development (the “Plan”) describes the Region’s Plans specific to housing, transportation, economic development, energy, natural resources, cultural resources and land use, and infrastructure.

The Project complements the Plan in several key areas. Upgrades to the E5/F6 Lines address concerns around aging infrastructure, and redevelopment of underutilized infrastructure, as outlined in Chapter 6 of the Plan. Improvements to the electric transmission system can contribute to advancing sustainable economic development, in particular for key high-energy use business sectors addressed by the Plan (including manufacturing, agriculture, and clean energy). The proposed Project contributes to the Plan's overarching vision of fostering economic growth through strategic investments in critical infrastructure. Furthermore, the proposed Project contributes to the goals of Chapter 7 of the Plan, creating

a sustainable energy future for the region. By upgrading the transmission infrastructure, the Project contributes significantly to mitigating current energy challenges faced by the county and will enable the system to respond to future increases in energy demand. By rebuilding the E5/F6 Lines within the existing ROW and minimizing environmental impacts through the appropriate use of BMPS, the Project also aligns with the region's goal of reducing environmental impact and promoting sustainability during development.

Finally, the Project aligns with the Plan's goals (outlined in Chapter 10 of the Plan), for land use and infrastructure. Through its focus on upgrading existing transmission line structures, optimizing their use, and prolonging their lifespan, the refurbishment of the E5/F6 Lines will complement existing transportation, water, and sewer infrastructure, promoting sustainable land use and integration of utility infrastructure.

RARE SPECIES SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to rare species or habitat (see 301 CMR 11.03(2))? _ Yes **_** No; **If yes, specify, in quantitative terms:**

(NOTE: If you are uncertain, it is recommended that you consult with the Natural Heritage and Endangered Species Program (NHESP) prior to submitting the ENF.)

ENF: Rare Species - taking of an endangered or threatened species or species of special concern, provided that the Project site is two or more acres and includes an area mapped as a Priority Site of Rare Species Habitats and Exemplary Natural Communities. (301 CMR 11.03(2)(b)(2)).

NEP is consulting with NHESP on potential impacts to rare species or habitat. If after consulting, the Project will result in a "take," a CMP will be prepared, and NEP will mitigate determined impacts based on NHESP's recommendation.

B. Does the project require any state permits related to rare species or habitat?
___ Yes ___ No

C. Does the project site fall within mapped rare species habitat (Priority or Estimated Habitat?) in the current Massachusetts Natural Heritage Atlas (attach relevant page)?
X Yes ___ No

D. If you answered "No" to all questions A, B and C, proceed to the Wetlands, Waterways, and Tidelands Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Rare Species section below.

II. Impacts and Permits

A. Does the project site fall within Priority or Estimated Habitat in the current Massachusetts Natural Heritage Atlas (attach relevant page)? X Yes ___ No;

1. If yes, have you consulted with the Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (NHESP)? X Yes ___ No; **If yes, have you received a determination as to whether the project will result in the "take" of a rare species? _**Yes ___ No; **If yes, attach the letter of determination to this submission.**

Consultations with NHESP are ongoing for the Project.

2. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes ___ No; **If yes, provide a summary of proposed measures to minimize and mitigate rare species impacts**

Consultations with NHESP are ongoing for the Project.

3. Which rare species are known to occur within the Priority or Estimated Habitat?

The Project ROW overlaps with Estimated and/or Priority Habitat for three bird, three reptile, one amphibian, five invertebrates, one fish, and 13 plant species. The names and locations of these species are not provided, as requested by NHESP.

4. Has the site been surveyed for rare species in accordance with the Massachusetts Endangered Species Act? _X_ Yes ___ No;

5. If your project is within Estimated Habitat, have you filed a Notice of Intent or received an Order of Conditions for this project? ___ Yes _X_ No; **If yes, did you send a copy of the Notice of Intent to the Natural Heritage and Endangered Species Program, in accordance with the Wetlands Protection Act regulations?** ___ Yes _X_ No;

Notices of Intent ("NOI") will be submitted at a later date to each municipality as required under the Wetlands Protection Act ("WPA"). Copies of the NOI will be provided to the NHESP in accordance with the regulations at that time.

B. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)?

___ Yes ___ No; **If yes, provide a summary of proposed measures to minimize and mitigate impacts to significant habitat:**

Consultations with NHESP are ongoing for the Project. If after consulting, the Project will result in a "take," a CMP will be prepared to compliance with the MESA.

WETLANDS, WATERWAYS, AND TIDELANDS SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to wetlands, waterways, and tidelands (see 301 CMR 11.03(3))? X Yes ___ No; **If yes, specify, in quantitative terms:**

The Project is anticipated to trigger four wetland MEPA thresholds. Refer to **Table 5** for the quantification of impacts associated with the following thresholds:

- 301 CMR 11.03(3)(a)(1)(a) – Alteration of 1 or more acres of BVW
- 301 CMR 11.03(3)(a)(1)(b) – Alteration of 10 or more acres of any other wetlands
- 301 CMR 11.03(3)(b)(1)(b) – Alteration of 500 or more linear feet of Bank along a fish run or Bank
- 301 CMR 11.03(3)(b)(1)(f) – Alteration of 0.5 or more acres of any other wetlands

B. Does the project require any state permits (or a local Order of Conditions) related to wetlands, waterways, or tidelands? X Yes ___ No; **If yes, specify which permit:**

- Individual Section 401 Water Quality Certification ("WQC") and Variance from MassDEP.
- Orders of Conditions from local Conservation Commissions.

C. If you answered "No" to both questions A and B, proceed to the Water Supply Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Wetlands, Waterways, and Tidelands Section below.

II. Wetlands Impacts and Permits

A. Does the project require a new or amended Order of Conditions under the Wetlands Protection Act (M.G.L. c.131A)? X Yes ___ No; **If yes, has a Notice of Intent been filed?** ___ Yes X No;

If yes, list the date and MassDEP file number: _____; If yes, has a local Order of Conditions been issued? ___ Yes ___ No; **Was the Order of Conditions appealed?** ___ Yes ___ No; **Will the project require a Variance from the Wetlands regulations?** ___ Yes ___ No;

B. Describe any proposed permanent or temporary impacts to wetland resource areas located on the project site:

Temporary impacts associated with construction matting are proposed within areas that are jurisdictional under the WPA regulations. Permanent impacts associated with access improvement and grading are proposed within buffer zones, RA, BLSF, BVW, and Land Under Water Bodies and Waterways ("LUW"). No permanent impacts are proposed within Inland Bank as a result of the Project.

C. Estimate the extent and type of impact that the project will have on wetland resources, and indicate whether the impacts are temporary or permanent:

Coastal Wetlands	Area (sf) or Length (linear ft)	Temporary or Permanent Impact?
Land Under the Ocean	0	N/A
Designated Port Areas	0	N/A
Coastal Beaches	0	N/A
Coastal Dunes	0	N/A
Barrier Beaches	0	N/A
Coastal Banks	0	N/A
Rocky Intertidal Shores	0	N/A
Salt Marshes	0	N/A
Land Under Salt Ponds	0	N/A
Land Containing Shellfish	0	N/A
Fish Runs	0	N/A
Land Subject to Coastal Storm Flowage	0	N/A
Inland Wetlands		
Bank (linear ft)	See Table 5	See Table 5
Bordering Vegetated Wetlands	See Table 5	See Table 5
Isolated Vegetated Wetlands	See Table 5	See Table 5
Land under Water	See Table 5	See Table 5
Isolated Land Subject to Flooding	See Table 5	See Table 5
Bordering Land Subject to Flooding	See Table 5	See Table 5
Riverfront Area	See Table 5	See Table 5

D. Is any part of the project:

1. Proposed as a limited project? X Yes __ No; **If yes, what is the area (in sf)?**

The entire Project can be considered a limited Project.

2. The construction or alteration of a dam? ___ Yes X No; **If yes, describe:**

3. Fill or structure in a velocity zone or regulatory floodway? __ Yes X No;

4. Dredging or disposal of dredged material? ___ Yes X No; **If yes, describe the volume of dredged material and the proposed disposal site:**

5. A discharge to an Outstanding Resource Water ("ORW") or an Area of Critical Environmental Concern ("ACEC")? X Yes __ No;

6. Subject to a wetlands restriction order? ___ Yes X No; **If yes, identify the area (in sf):**

7. Located in buffer zones? X Yes ___ No; **If yes, how much (in sf) _____**

E. Will the project:

1. Be subject to a local wetlands ordinance or bylaw? X Yes ___ No;

2. Alter any federally-protected wetlands not regulated under state law? X Yes ___ No; **If yes, what is the area (sf)?**

For the purpose of this filing, it assumed that all Isolated Vegetated Wetlands not meeting the

criteria for Isolated Land Subject to Flooding are federally jurisdictional. Temporary impacts from construction matting total approximately 68,654 sf; permanent impacts from access and structure work total approximately 253 sf; and permanent alterations from the conversion of vegetative cover types total approximately 24,995 sf.

III. Waterways and Tidelands Impacts and Permits

A. Does the project site contain waterways or tidelands (including filled former tidelands) that are subject to the Waterways Act, M.G.L.c.91? _X_ Yes ___ No; **If yes, is there a current Chapter 91 License or Permit affecting the project site?** ___ Yes _X_ No; **If yes, list the date and license or permit number and provide a copy of the historic map used to determine extent of filled tidelands:**

Pursuant to 310 CMR 9.05(3)(g)(1), because a final Order of Conditions issued under M.G.L. c. 131, §40 and 310 CMR 10.00 will be issued for all Project waterways crossing, the crossings do not require authorization under c. 91.

B. Does the project require a new or modified license or permit under M.G.L.c.91? ___ Yes _X_ No; **If yes, how many acres of the project site subject to M.G.L.c.91 will be for non-water-dependent use?**

Current ___ Change ___ Total ___ **If yes, how many square feet of solid fill or pile-supported structures (in sf)?**

C. For non-water-dependent use projects, indicate the following:

Area of filled tidelands on the site: N/A____

Area of filled tidelands covered by buildings: N/A____

For portions of site on filled tidelands, list ground floor uses and area of each use: N/A____

Does the project include new non-water-dependent uses located over flowed tidelands? ___ Yes _X_ No;

Height of building on filled tidelands N/A____

Also show the following on a site plan: Mean High Water, Mean Low Water, Water-dependent Use Zone, location of uses within buildings on tidelands, and interior and exterior areas and facilities dedicated for public use, and historic high and historic low water marks.

D. Is the project located on landlocked tidelands? ___ Yes _X_ No; **If yes, describe the project's impact on the public's right to access, use and enjoy jurisdictional tidelands and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:**

E. Is the project located in an area where low groundwater levels have been identified by a municipality or by a state or federal agency as a threat to building foundations? ___ Yes _X_ No; **If yes, describe the project's impact on groundwater levels and describe measures the project will implement to avoid, minimize, or mitigate any adverse impact:**

F. Is the project non-water-dependent and located on landlocked tidelands or waterways or tidelands subject to the Waterways Act and subject to a mandatory EIR? ___ Yes _X_ No;

(NOTE: If yes, then the project will be subject to Public Benefit Review and Determination.)

G. Does the project include dredging? ___ Yes _X_ No; **If yes, answer the following**

questions:

What type of dredging? Improvement ___ Maintenance ___ Both ____

What is the proposed dredge volume, in cubic yards (cys) _____

What is the proposed dredge footprint ____length (ft) ___width (ft) ____depth (ft);

Will dredging impact the following resource areas?

Intertidal ___ Yes X No; **If yes,** ___ sq ft

Outstanding Resource Waters ___ Yes X No; **If yes,** ___ sq ft

Other resource area (i.e. shellfish beds, eel grass beds) _ Yes X No; **If yes,** __ sq ft

If yes to any of the above, have you evaluated appropriate and practicable steps to: 1) avoidance; 2) if avoidance is not possible, minimization; 3) if either avoidance or minimize is not possible, mitigation?

If no to any of the above, what information or documentation was used to support this determination?

Provide a comprehensive analysis of practicable alternatives for improvement dredging in accordance with 314 CMR 9.07(1)(b). Physical and chemical data of the sediment shall be included in the comprehensive analysis.

Sediment Characterization

Existing gradation analysis results? __ Yes __ No: **If yes, provide results.**

Existing chemical results for parameters listed in 314 CMR 9.07(2)(b)6? ___Yes ____No; **If yes, provide results.**

Do you have sufficient information to evaluate feasibility of the following management options for dredged sediment? If yes, check the appropriate option.

Beach Nourishment ___

Unconfined Ocean Disposal ___

Confined Disposal:

Confined Aquatic Disposal (CAD) ___

Confined Disposal Facility (CDF) ___

Landfill Reuse in accordance with COMM-97-001 ___

Shoreline Placement ___

Upland Material Reuse____

In-State landfill disposal____

Out-of-state landfill disposal ____

(NOTE: This information is required for a 401 Water Quality Certification.)

IV. Consistency:

A. Does the project have effects on the coastal resources or uses, and/or is the project located within the Coastal Zone? ___ Yes _X_ No; **If yes, describe these effects and the projects consistency with the policies of the Office of Coastal Zone Management:**

B. Is the project located within an area subject to a Municipal Harbor Plan? ___ Yes _X_ No; **If yes, identify the Municipal Harbor Plan and describe the project's consistency with that plan:**

WATER SUPPLY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to water supply (see 301 CMR 11.03(4))? ___ Yes _X_ No; **if yes, specify, in quantitative terms:**

B. Does the project require any state permits related to water supply?

___ Yes _X_ No; **if yes, specify which permit:**

C. If you answered "No" to both questions A and B, proceed to the Wastewater Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Water Supply Section below.

II. Impacts and Permits

A. Describe, in gallons per day (gpd), the volume and source of water use for existing and proposed activities at the project site:

	Existing	Change	Total
Municipal or regional water supply	_____	_____	_____
Withdrawal from groundwater	_____	_____	_____
Withdrawal from surface water	_____	_____	_____
Interbasin transfer	_____	_____	_____

(NOTE: Interbasin Transfer approval will be required if the basin and community where the proposed water supply source is located is different from the basin and community where the wastewater from the source will be discharged.)

B. If the source is a municipal or regional supply, has the municipality or region indicated that there is adequate capacity in the system to accommodate the project? ___ Yes ___ No

C. If the project involves a new or expanded withdrawal from a groundwater or surface water source, has a pumping test been conducted? ___ Yes ___ No; **If yes, attach a map of the drilling sites and a summary of the alternatives considered and the results. _____**

D. What is the currently permitted withdrawal at the proposed water supply source (in gallons per day)? Will the project require an increase in that withdrawal? ___Yes ___No; **if yes, then how much of an increase (gpd)? _____**

E. Does the project site currently contain a water supply well, a drinking water treatment facility, water main, or other water supply facility, or will the project

involve construction of a new facility? ___ Yes ___ No. **If yes, describe existing and proposed water supply facilities at the project site:**

	Permitted Flow	Existing Avg Daily Flow	Project Flow	Total
Capacity of water supply well(s) (gpd)	_____	_____	_____	_____
Capacity of water treatment plant (gpd)	_____	_____	_____	_____

F. If the project involves a new interbasin transfer of water, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or proposed?

G. Does the project involve:

1. new water service by the Massachusetts Water Resources Authority or other agency of the Commonwealth to a municipality or water district?

___ Yes ___ No

2. a Watershed Protection Act variance? ___ Yes ___ No; **If yes, how many acres of alteration?**

3. a non-bridged stream crossing 1,000 or less feet upstream of a public surface drinking water supply for purpose of forest harvesting activities? ___ Yes ___ No

III. Consistency

Describe the project's consistency with water conservation plans or other plans to enhance water resources, quality, facilities and services:

WASTEWATER SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to wastewater (see 301 CMR 11.03(5))? ___ Yes _X_ No; **If yes, specify, in quantitative terms:**

B. Does the project require any state permits related to wastewater?

___ Yes _X_ No; **If yes, specify which permit:**

C. If you answered "No" to both questions A and B, proceed to the Transportation - Traffic Generation Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Wastewater Section below.

II. Impacts and Permits

A. Describe the volume (in gallons per day) and type of disposal of wastewater generation for existing and proposed activities at the project site (calculate according to 310 CMR 15.00 for septic systems or 314 CMR 7.00 for sewer systems):

	Existing	Change	Total
Discharge of sanitary wastewater	_____	_____	_____
Discharge of industrial wastewater	_____	_____	_____
TOTAL	_____	_____	_____

	Existing	Change	Total
Discharge to groundwater	_____	_____	_____
Discharge to outstanding resource water	_____	_____	_____
Discharge to surface water	_____	_____	_____
Discharge to municipal or regional wastewater facility	_____	_____	_____
TOTAL	_____	_____	_____

B. Is the existing collection system at or near its capacity? ___ Yes ___ No; **If yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:**

C. Is the existing wastewater disposal facility at or near its permitted capacity? ___ Yes___ No; **If yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:**

D. Does the project site currently contain a wastewater treatment facility, sewer main, or other wastewater disposal facility, or will the project involve construction of a new facility? ___ Yes ___ No; **if yes, describe as follows:**

	Permitted	Existing Avg Daily Flow	Project Flow	Total
Wastewater treatment plant capacity (in gallons per day)	_____	_____	_____	_____

E. If the project requires an interbasin transfer of wastewater, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or new?

(NOTE: Interbasin Transfer approval may be needed if the basin and community where wastewater will be discharged is different from the basin and community where the source of water supply is located.)

F. Does the project involve new sewer service by the Massachusetts Water Resources Authority (MWRA) or other Agency of the Commonwealth to a municipality or sewer district? ___ Yes ___ No

G. Is there an existing facility, or is a new facility proposed at the project site for the storage, treatment, processing, combustion or disposal of sewage sludge, sludge ash, grit, screenings, wastewater reuse (gray water) or other sewage residual materials? ___ Yes ___ No; **If yes, what is the capacity (tons per day):**

	Existing	Change	Total
Storage	_____	_____	_____
Treatment	_____	_____	_____
Processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

H. Describe the water conservation measures to be undertaken by the project, and other wastewater mitigation, such as infiltration and inflow removal.

III. Consistency

A. Describe measures that the proponent will take to comply with applicable state, regional, and local plans and policies related to wastewater management:

B. If the project requires a sewer extension permit, is that extension included in a comprehensive wastewater management plan? ___ Yes ___ No; **If yes, indicate the EEA number for the plan and whether the project site is within a sewer service area recommended or approved in that plan:**

TRANSPORTATION SECTION (TRAFFIC GENERATION)

I. Thresholds / Permit

A. Will the project meet or exceed any review thresholds related to traffic generation (see 301 CMR 11.03(6))? ___ Yes _X_ No; **If yes, specify, in quantitative terms:**

Massachusetts Department of Environmental Protection ("MassDOT") is expected to review the Project for:

- Overhead wire crossings of state highways
- Temporary access during construction onto the NEP Project ROW from state highways Permanent Access Permit for new access and proposed structures within the Highway Layout

B. Does the project require any state permits related to state-controlled roadways? _X_ Yes ___ No; **If yes, specify which permit:**

Table 5: State Highway Access Permit for Non-Municipal Utility

Municipality	State-controlled Roadway
DISTRICT 1	
Shelburne	Main Street (MA-112)
	Mohawk Trail (MA-2)
DISTRICT 2	
Deerfield	Interstate 91
	Greenfield Road (US-5/MA-10)
Leverett	Long Plain Road (MA-63)
Pelham	Daniel Shay Highway (US-202)
Ware	Belchertown Road (MA-9)
	Gilbertville Road (MA-32)
DISTRICT 3	
Spencer	West Main Street (MA-9)
Auburn	Interstate 290
	Southbridge Street (MA-12)
	Massachusetts Turnpike (I-90)
	Washington Street (US-20)
Millbury	Worcester-Providence Turnpike (MA-146)

C. If you answered "No" to both questions A and B, proceed to the Roadways and Other Transportation Facilities Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Traffic Generation Section below.

II. Traffic Impacts and Permits

A. Describe existing and proposed vehicular traffic generated by activities at the project site:

	Existing	Change	Total
Number of parking spaces	N/A	N/A	_____
Number of vehicle trips per day	N/A	N/A	_____
ITE Land Use Code(s):	N/A	N/A	_____

The Project will not cause permanent traffic impacts and is not anticipated to cause significant temporary traffic impacts. During construction, shield wires and conductors will be installed using tensioning equipment to pull the conductors through the stringing blocks. When this activity occurs near state roadways, temporary guard structures or boom trucks may be placed at road and highway crossings to ensure public safety. NEP is reviewing the proposed location of guard structures.

Proposed construction traffic will be temporary in nature, occurring along different sections of NEP's Project ROW during the various stages of construction. Traffic will be limited to construction-related vehicles accessing the utility ROW using existing routes off state highways. Traffic volume during construction of the utility line will not significantly affect existing volumes or adversely impact the ability of existing traffic to safely navigate the roadway.

B. What is the estimated average daily traffic on roadways serving the site?

Roadway	Existing	Change	Total
1. _____	N/A	N/A	_____
2. _____	N/A	N/A	_____
3. _____	N/A	N/A	_____

Intermittent construction-related traffic associated with Project construction will occur over the entire construction period. Construction equipment typically will gain access to the ROWs from public roadways crossing the ROWs in various locations along the route. Because each of the construction tasks will occur at different times and locations over the course of the construction, traffic will be intermittent at these entry roadways. Traffic will consist of vehicles ranging from pick-up trucks to heavy construction equipment to large trailers delivering materials.

Proposed construction traffic will be temporary in nature, occurring along different sections of NEP's Project ROW during the various stages of construction. Traffic will be limited to construction-related vehicles accessing the utility ROW using existing routes off state highways. Traffic volume during construction or maintenance of the utility line will not significantly affect existing volumes or adversely impact the ability of existing traffic to safely navigate the roadway.

C. If applicable, describe proposed mitigation measures on state-controlled roadways that the project proponent will implement:

MassDOT Districts 1, 2 and 3 will be contacted to discuss specific design information and anticipated Project activities within highway jurisdiction. With MassDOT's input, Traffic Management Plans with complete details of proposed work will be developed and submitted to MassDOT for review and approval prior to the start of Project construction. Enforceable

commitments in the Traffic Management Plans will be carried out by NEP to ensure that all proposed traffic mitigation strategies will be implemented as the Project proceeds. Such strategies may include, as appropriate, traffic management procedures; construction time restrictions; signage; installation of track pads to minimize soil in roadways; and/or restoration of vegetation along soft shoulders after construction. All work will occur in accordance with NEP's Policy for ROW Access, Maintenance, and Construction BMPs; further information on construction BMPs will be provided in the DEIR.

C. How will the project implement and/or promote the use of transit, pedestrian and bicycle facilities and services to provide access to and from the project site?

Not Applicable.

D. Is there a Transportation Management Association (TMA) that provides transportation demand management (TDM) services in the area of the project site? ____ Yes ____ No; **If yes, describe if and how the project will participate in the TMA:**

Not Applicable.

E. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation facilities? _X_ Yes _ No; **If yes, generally describe:**

Project activities will occur in the immediate vicinity of the following rail lines:

- Pan Am Systems ("PAS") (Patriot Corridor) – Conway, MA
- PAS (Conn River Main Line) – Deerfield, MA
- New England Central Railroad ("NECR") (Central Vermont) – Leverett, MA
- Pan Am Railways ("PAR") (Central Mass) – Ware, MA
- MassDOT- Rail (Ware River Branch) – Ware, MA
- Chessie Seaboard X ("CSX") (Boston) – Auburn, MA
- Providence and Worcester ("P&W") (Norwich & Worcester) – Auburn, MA
- P&W – Millbury, MA

E. If the project will penetrate approach airspace of a nearby airport, has the proponent filed a Massachusetts Aeronautics Commission Airspace Review Form (780 CMR 111.7) and a Notice of Proposed Construction or Alteration with the Federal Aviation Administration (FAA) (CFR Title 14 Part 77.13, forms 7460-1 and 7460-2)?

The E5/F6 Line Project ROW is approximately 3.03 miles away from the nearest airport ("Oxford Airport"). Since Project activities are greater than two miles from the nearest Municipal Airport Runway, a Massachusetts Aeronautics Commission Airspace Review Form is not required. Project activities are greater than four miles from a major airport that has a runway long enough to trigger a Federal Aviation Administration ("FAA") review.

III. Consistency

Describe measures that the proponent will take to comply with municipal, regional, state, and federal plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services:

Project construction will not affect transit, pedestrian, or bicycle transportation facilities since work will primarily occur on a cross-country NEP ROW, which is not designated for public

use. The Project is consistent with federal, state, regional and local plans, and policies; minimal, if any, impacts related to roadways or other transportation facilities are anticipated.

TRANSPORTATION SECTION (ROADWAYS AND OTHER TRANSPORTATION FACILITIES)

I. Thresholds

A. Will the project meet or exceed any review thresholds related to roadways or other transportation facilities (see 301 CMR 11.03(6))? ___ Yes _X_ No; **If yes, specify, in quantitative terms:**

B. Does the project require any state permits related to roadways or other transportation facilities? ___ Yes _X_ No; **If yes, specify which permit:**

C. If you answered "No" to both questions A and B, proceed to the Energy Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Roadways Section below.

II. Transportation Facility Impacts

A. Describe existing and proposed transportation facilities in the immediate vicinity of the project site:

B. Will the project involve any

1. **Alteration of bank or terrain (in linear feet)?** _____
2. **Cutting of living public shade trees (number)?** _____
3. **Elimination of stone wall (in linear feet)?** _____

III. Consistency

Describe the project's consistency with other federal, state, regional, and local plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services, including consistency with the applicable regional transportation plan and the Transportation Improvements Plan (TIP), the State Bicycle Plan, and the State Pedestrian Plan:

ENERGY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to energy (see 301 CMR 11.03(7))? ___ Yes _X_ No; **If yes, specify, in quantitative terms:**

B. Does the project require any state permits related to energy? _X_ Yes ___ No; **If yes, specify which permit:**

- Energy Facility Siting Board ("EFSB"), Approval under M.G.L. c.164 § 69J
- Department of Public Utilities ("DPU"), Approval to Construct under M.G.L. c.164 § 72

C. If you answered "No" to both questions A and B, proceed to the Air Quality Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Energy Section below.

II. Impacts and Permits

A. Describe existing and proposed energy generation and transmission facilities at the project site:

	Existing	Change	Total
Capacity of electric generating facility (megawatts)			
Length of fuel line (in miles)			
Length of transmission lines (in miles)	**~67 Miles**		**~67 Miles**
Capacity of transmission lines (in kilovolts)	**69kV**	**115kV**	**115kV**

B. If the project involves construction or expansion of an electric generating facility, what are:

1. the facility's current and proposed fuel source(s)? N/A

2. the facility's current and proposed cooling source(s)? N/A

C. If the project involves construction of an electrical transmission line, will it be located on a new, unused, or abandoned right of way? ___Yes _X_ No; **If yes, please describe:**

D. Describe the project's other impacts on energy facilities and services:

The Project proposes complete asset refurbishment and system improvements to the Lines. The purpose is to ensure reliable and continuous electricity is provided across the region, meeting current and future predicted energy demands.

NEP will also be installing OPGW, which serves the dual purpose of providing electrical grounding in the event of lightning strikes, while also enabling fast telecommunication along the lines. This is critical for rapidly identifying and responding to problems, such as damage to the infrastructure from storm events. In addition, due to poor access along most of the ROW corridor, access improvements or re-establishment and construction of new access will be undertaken to conduct the proposed work and to support future maintenance of the proposed infrastructure. As such, the Project will result in positive impacts to energy facilities and services, by improving electrical reliability, resilience, and connectivity across the region.

III. Consistency

Describe the project's consistency with state, municipal, regional, and federal plans and policies for enhancing energy facilities and services:

The Project, addressing asset conditions and the need for system improvements, includes refurbishment activities to the existing electrical structures, improvements to access, and the installation of stormwater management features. As a result, the Project will result in the following benefits associated with enhanced energy facilities and services:

- Safe and reliable access and work areas at each transmission structure.
- Reliable and continuous electricity supply for customers, including increased reliability during extreme weather events.
- Rapid telecommunication along the transmission lines and between substations.

These impacts align with the following federal, state, regional, and municipal plans and policies for enhancing energy facilities and services:

Federal

The Project is generally consistent with federal policies related to maintaining reliable energy delivery systems and enhancing energy infrastructure to accommodate alternative energy supply.

State

The Project is generally consistent with important state energy laws and policies, such as the Electric Utility Restructuring Act of 1997 (the “Restructuring Act”), the Green Communities Act (c. 169 of the Acts of 2008), the Global Warming Solutions Act (c. 298 of the Acts of 2008) (the “GWSA”), the Energy Diversity Act (c. 188 of the Acts of 2016), the Clean Energy Act (c. 227 of the Acts of 2018), An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy (c. 8 of the Acts of 2021) (the “Roadmap Act”), and An Act Driving Clean Energy and Offshore Wind (St. 2022, c. 179) (the “Drive Act”).

Regional

Regional Greenhouse Gas Initiative (“RGGI”): In January 2007, Massachusetts joined the RGGI, a cooperative effort by Northeast and Mid-Atlantic States to reduce carbon dioxide (“CO2”) emissions from large fossil-fueled power plants. In 2018, Massachusetts joined eight other states in developing amendments to revise the RGGI, including reductions to the regional cap and other programmatic changes. As the Project will increase capacity for transmission of energy from renewable sources, which do not produce carbon emissions as part of the electricity generation process, the Project is consistent with the RGGI.

New England Energy Vision: In 2020, Massachusetts joined with the five other New England states in forming New England Energy Vision and its respective Vision Statement. The vision is one of a clean, affordable, and reliable regional electric grid, achievable through three core segments: Wholesale Electricity Market Design, Transmission System Planning, and Independent System Operator (“ISO”) New England Governance. Advancements have since been made in all three core segments, including a 2021 “Report to the Governors” and a joint initiative for innovation in design concepts (2022-2023). Given that the Project involves upgrading and replacing existing infrastructure to result in more clean, affordable, and reliable transmission, it aligns with the New England Energy Vision.

New England States Committee on Electricity (“NESCOE”): NESCOE is a not-for-profit entity,

regional committee, recognized by the Federal Energy Regulatory Commission ("FERC"). NESCOE advances the New England states' common interest of reliable, low-cost provision of electricity to consumers through two focus areas: Resource Adequacy, and System Planning and Expansion. This Project strengthens infrastructure, ensuring a reliable and continuous electricity supply for customers, thereby remaining consistent with the NESCOE vision.

Municipal

The Green Communities Act: On July 2, 2008, Massachusetts Governor Deval Patrick signed into law the 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 RGGI, 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, An Act Relative to Competitively Priced Electricity) can be expected to result in greater renewable supplies and substantial new conservation initiatives in future years. In order to achieve Green Community Designation, municipalities must meet five criteria:

- Criterion 1 is met by passing zoning in designated locations for the as-of-right siting of renewable or alternative energy generating facilities, research and development facilities, or manufacturing facilities;
- Criterion 2 is met by adopting an expedited application and permitting of one year at most, under which facilities interested in locating their facility in a designated renewable zone may be sites within the municipality;
- Criterion 3 is met by (i) establishing an energy baseline inventory for municipal buildings and facilities, and (ii) adopting an Energy Reduction Plan demonstration a reduction of 20% of energy use after five years of implementation;
- Criterion 4 is met if all departments within a Green Community purchase fuel-efficient vehicles for municipal use, whenever such vehicles are commercially available and practicable; and
- Criterion 5 is met if municipalities minimize the life-cycle cost of all newly constructed homes and buildings.

Shelburne, Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, Spencer, Leicester, Auburn and Millbury are all designated Green Communities. The improvements to the transmission system in the region will further the goals of the Green Communities Act by ensuring a reliable, efficient energy supply. The Project also supports the communities' interest in an energy supply from renewable energy sources. The Project, therefore, advances the important policy objectives of the Green Communities Act.

The Massachusetts Municipal Vulnerability Preparedness ("MVP") Grant Program: The MVP Grant Program was created in 2017, as result of Executive Order No. 569, signed by Governor Charlie Baker on September 16, 2016. The Program provides support for cities and towns in Massachusetts to identify climate hazards, assess vulnerabilities, and develop action plans to improve resilience to climate change. Communities that complete the MVP Planning Grant process become designated as an MVP Community and are eligible for MVP Action Grant funding to implement the Priority Actions identified through the planning process. Thirteen of the 16 towns along the Project ROW, including Deerfield, Sunderland,

Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, Spencer, Leicester, Auburn, Conway, and Millbury have all achieved MVP Community designation as a result of going through the MVP planning process, all of which identified power outages as vulnerabilities in their communities. Additionally, some of the plans also addressed transitions to clean energy sources. As the Project will increase reliability and decrease likelihood of outages during extreme weather events, as well as increase capacity for transmission of energy from renewable sources, the Project is consistent with MVP Program. Please see also the Land Section above, which outlines conformance with regional Plans, including those relating to Land Use and Energy/Infrastructure.

AIR QUALITY SECTION

I. Thresholds

A. Will the project meet or exceed any review thresholds related to air quality (see 301 CMR 11.03(8))? ___ Yes _X_ No; **if yes, specify, in quantitative terms:**

B. Does the project require any state permits related to air quality? __ Yes _X_ No; **If yes, specify which permit:**

C. If you answered "No" to both questions A and B, proceed to the Solid and Hazardous Waste Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Air Quality Section below.

II. Impacts and Permits

A. Does the project involve construction or modification of a major stationary source (see 310 CMR 7.00, Appendix A)? ___ Yes ___ No; **If yes, describe existing and proposed emissions (in tons per day) of:**

	Existing	Change	Total
Particulate matter	_____	_____	_____
Carbon monoxide	_____	_____	_____
Sulfur dioxide	_____	_____	_____
Volatile organic compounds	_____	_____	_____
Oxides of nitrogen	_____	_____	_____
Lead	_____	_____	_____
Any hazardous air pollutant	_____	_____	_____
Carbon dioxide	_____	_____	_____

B. Describe the project's other impacts on air resources and air quality, including noise impacts:

III. Consistency

A. Describe the project's consistency with the State Implementation Plan:

B. Describe measures that the proponent will take to comply with other federal, state, regional, and local plans and policies related to air resources and air quality:

SOLID AND HAZARDOUS WASTE SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to solid or hazardous waste (see 301 CMR 11.03(9))? ___ Yes _X_ No; **If yes, specify, in quantitative terms:**

B. Does the project require any state permits related to solid and hazardous waste? ___ Yes _X_ No; **If yes, specify which permit:**

C. If you answered "No" to both questions A and B, proceed to the Historical and Archaeological Resources Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Solid and Hazardous Waste Section.

II. Impacts and Permits

A. Is there any current or proposed facility at the project site for the storage, treatment, processing, combustion or disposal of solid waste? ___ Yes ___ No; **If yes, what is the volume (in tons per day) of the capacity:**

	Existing	Change	Total
Storage	_____	_____	_____
Treatment, processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

B. Is there any current or proposed facility at the project site for the storage, recycling, treatment or disposal of hazardous waste? ___ Yes ___ No; **If yes, what is the volume (in tons or gallons per day) of the capacity:**

	Existing	Change	Total
Storage	_____	_____	_____
Treatment, processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

C. If the project will generate solid waste (ex. during demolition or construction), describe alternatives considered for re-use, recycling, and disposal:

D. If the project involves demolition, do any buildings to be demolished contain asbestos? ___ Yes ___ No

E. Describe the project's other solid and hazardous waste impacts (including indirect impacts):

III. Consistency

Describe measures that the proponent will take to comply with the State Solid Waste Master Plan:

HISTORICAL AND ARCHAEOLOGICAL RESOURCES SECTION

I. Thresholds / Impacts

A. Have you consulted with the Massachusetts Historical Commission? X Yes ___ No; **If yes, attach correspondence.**

Refer to **Attachment E: Correspondence**

For project sites involving lands underwater, have you consulted with the Massachusetts Board of Underwater Archaeological Resources? X Yes __ No; if yes, attach correspondence

Refer to **Attachment E: Correspondence**

B. Is any part of the project site a historic structure, or a structure within a historic district, in either case listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth?

X Yes ___ No; **If yes, does the project involve the demolition of all or any exterior part of such historic structure?** ___ Yes X No; **If yes, please describe:**

NEP retained The Public Archaeology Laboratory, Inc. ("PAL") to undertake a historic and archaeological review of the Project corridor. PAL conducted a cultural resource due diligence and archaeological sensitivity assessment of the Project ROW in June 2022. PAL reviewed the proposed Project impact areas and prepared a technical proposal to conduct an intensive (locational) archaeological survey for the Project. PAL submitted a State Archaeologist's Permit application to the Massachusetts Historical Commission ("MHC") for the E5/F6 lines on August 1, 2022. On August 8, 2022, the MHC issued Permit #4206 to PAL to conduct the survey .

PAL started the survey in October 2022, which is on-going. PAL will file a survey report with the MHC in the 2nd quarter of 2025. NEP will continue to consult with the MHC and with the Army Corps of Engineers ("USACE") and federal Native American Tribes through the federal Section 106 consultation process.

PAL is in the process of developing a historic architectural reconnaissance survey; the effort began in the fourth quarter of 2024 and is ongoing at the time of the ENF filing. PAL plans to submit a report to the MHC on the results of the survey in the first quarter of 2025.

C. Is any part of the project site an archaeological site listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? __ Yes X No; **if yes, does the project involve the destruction of all or any part of such archaeological site?** ___ Yes X No; **If yes, please describe:**

D. If you answered "No" to all parts of both questions A, B and C, proceed to the Attachments and Certifications Sections. If you answered "Yes" to any part of either question A or question B, fill out the remainder of the Historical and Archaeological Resources Section below.

II. Impacts

Describe and assess the project's impacts, direct and indirect, on listed or inventoried historical and archaeological resources:

As noted above, there are no listed or inventoried sites within the Project site and no impacts to listed or inventoried historical or archaeological resources is anticipated at this time.

III. Consistency

Describe measures that the proponent will take to comply with federal, state, regional, and local plans and policies related to preserving historical and archaeological resources:

If, after further assessment by PAL, historical or archaeological resources eligible for listing in the National Register of Historic Places ("NRHP") are discovered that may be impacted by the Project, NEP will consult with both the USACE and MHC on avoidance, minimization and mitigation to the extent required by law. As part of its Section 404 permit review, pursuant to Section 106 of the National Historic Preservation Act ("NHPA"), the USACE will also consult with Native American Tribes that express an interest in historic resources that may be affected by portions of the Project within USACE jurisdiction.

CLIMATE CHANGE ADAPTATION AND RESILIENCY SECTION

This section of the Environmental Notification Form (ENF) solicits information and disclosures related to climate change adaptation and resiliency, in accordance with the MEPA Interim Protocol on Climate Change Adaptation and Resiliency (the "MEPA Interim Protocol"), effective October 1, 2021. The Interim Protocol builds on the analysis and recommendations of the 2018 Massachusetts Integrated State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) and incorporates the efforts of the Resilient Massachusetts Action Team (RMAT), the inter-agency steering committee responsible for implementation, monitoring, and maintenance of the SHMCAP, including the "Climate Resilience Design Standards and Guidelines" project. The RMAT team recently released the RMAT Climate Resilience Design Standards Tool, which is available here.

The MEPA Interim Protocol is intended to gather project-level data in a standardized manner that will both inform the MEPA review process and assist the RMAT team in evaluating the accuracy and effectiveness of the RMAT Climate Resilience Design Standards Tool. Once this testing process is completed, the MEPA Office anticipates developing a formal Climate Change Adaptation and Resiliency Policy through a public stakeholder process. Questions about the RMAT Climate Resilience Design Standards Tool can be directed to rmat@mass.gov.

All Proponents must complete the following section, referencing as appropriate the results of the output report generated by the RMAT Climate Resilience Design Standards Tool and attached to the ENF. In completing this section, Proponents are encouraged, but not required at this time, to utilize the recommended design standards and associated Tier 1/2/3 methodologies outlined in the RMAT Climate Resilience Design Standards Tool to analyze the project design. However, Proponents are requested to respond to a respond to a user feedback survey on the RMAT website or to provide feedback to rmat@mass.gov, which will be used by the RMAT team to further refine the tool. Proponents are also encouraged to consult general guidance and best practices as described in the RMAT Climate Resilience Design Guidelines.

Climate Change Adaptation and Resiliency Strategies

I. Has the project taken measures to adapt to climate change for all of the climate parameters analyzed in the RMAT Climate Resilience Design Standards Tool (sea level rise/storm surge, extreme precipitation (urban or riverine flooding), extreme heat)? X Yes __ No

Note: Climate adaptation and resiliency strategies include actions that seek to reduce vulnerability to anticipated climate risks and improve resiliency for future climate conditions. Examples of climate adaptation and resiliency strategies include flood barriers, increased stormwater infiltration, living shorelines, elevated infrastructure, increased tree canopy, etc. Projects should address any planning priorities identified by the affected municipality through the Municipal Vulnerability Preparedness (MVP) program or other planning efforts, and should consider a flexible adaptive pathways approach, an adaptation best practice that encourages design strategies that adapt over time to respond to changing climate conditions. General guidance and best practices for designing for climate risk are described in the RMAT Climate Resilience Design Guidelines.

A. If no, explain why.

B. If yes, describe the measures the project will take, including identifying the planning horizon and climate data used in designing project components. If applicable, specify the return period and design storm used (e.g., 100-year, 24-hour storm).

NEP has taken steps to promote climate change adaptation and resiliency in the design of the Project. The Project will result in a more climate-ready and resilient transmission system that can withstand more extreme weather events; address existing system capacity shortages and increased demand; and support future interconnections from renewable energy projects. In addition, NEP's preferred solution uses substantial portions of existing ROW, thereby minimizing alteration of new land resources to construct the Project.

C. Is the project contributing to regional adaptation strategies? X Yes __ No; **If yes, describe.**

Of the 16 towns crossed by the Project, 13 have achieved MVP Community designation. All 13 municipalities identified power outages as a vulnerability in their communities during community resilience building workshops and associated summary of findings reports and sought to identify ways to improve power utility resilience. Vulnerability due to high winds, snow and ice loads, and trees were common concerns resulting in frequent and/or long duration power outages. While this Project does not address local distribution, transmission line and structure replacements are intended to result in a more reliable and resilient transmission system supporting these communities.

II. Has the Proponent considered alternative locations for the project in light of climate change risks? ___ Yes X No

A. If no, explain why.

The proposed Project location, within the existing ROW, is the only location that meets the identified Project need and reliability, addresses the various regulatory objectives, minimizes environmental impacts, and provides a cost-effective solution to customers. Also, the Project is located outside of areas identified as vulnerable to sea level rise and coastal flooding.

B. If yes, describe alternatives considered.

III. Is the project located in Land Subject to Coastal Storm Flowage (LSCSF) or Bordering Land Subject to Flooding (BLSF) as defined in the Wetlands Protection Act?
X Yes ___ No

If yes, describe how/whether proposed changes to the site's topography (including the addition of fill) will result in changes to floodwater flow paths and/or velocities that could impact adjacent properties or the functioning of the floodplain. General guidance on providing this analysis can be found in the CZM/MassDEP Coastal Wetlands Manual, available here.

The Project is not located within Land Subject to Coastal Storm Flowage ("LSCSF"); however, it is within areas of BLSF. Where new and improved access is proposed within BLSF, the area will be over excavated resulting in no loss of flood storage. Concrete caisson foundations are proposed within BLSF. NEP will provide compensatory flood storage as required under state and local requirements.

ENVIRONMENTAL JUSTICE SECTION

I. Identifying Characteristics of EJ Populations

A. If an Environmental Justice (EJ) population has been identified as located in whole or in part within 5 miles of the project site, describe the characteristics of each EJ populations as identified in the EJ Maps Viewer (i.e., the census block group identification number and EJ characteristics of "Minority," "Minority and Income," etc.). Provide a breakdown of those EJ populations within 1 mile of the project site, and those within 5 miles of the site.

Within the Designated Geographic Area ("DGA") ("1-mile"), NEP identified 19 Environmental Justice ("EJ") Populations across 13 municipalities in Hampshire, Worcester, and Franklin Counties. Of these, three meet the criteria of "Minority and Income," three meet "Minority," and thirteen meet "Income" criterion. Within a 5-mile radius of the Project, NEP identified 158 EJ Populations across eight municipalities spanning four counties. Of these, 59 meet "Minority and Income" criteria, 55 meet "Minority" criterion, and 30 meet "Income" criterion, with additional populations meeting combinations of criteria such as "Minority, income, and English isolation" and "Minority and English isolation." Refer to **Table 12** for specific census block group identification numbers and EJ characteristics, and **Attachment D: Environmental Justice**, for maps showing EJ block groups.

Table 12: Environmental Justice Population Characteristics Within 1 and 5 Miles from the E5/F6 Lines

Block Group	Census Tract	Municipality	Minority Population (%)	Median Household Income ($)	English Isolation (%)	EJ Criteria Met
Within 1 Mile						
4	401	Charlemont	9.7%	$53,229	0.0%	Income
2	408	Sunderland	23.1%	$47,614	5.7%	Income
3	408	Sunderland	29.2%	$95,230	6.6%	Minority
4	408	Sunderland	24.8%	$41,845	2.3%	Minority and income
3	415.02	Buckland	9.0%	$44,063	0.0%	Income
4	415.02	Shelburne	9.4%	$49,063	4.8%	Income
2	7231	Hardwick	12.3%	$39,205	0.0%	Income
3	7241	West Brookfield	10.8%	$36,913	0.0%	Income
3	7251	North Brookfield	11.9%	$51,053	0.0%	Income
3	7262	Spencer	20.8%	$37,448	0.0%	Income
4	7262	Spencer	17.3%	$28,977	0.0%	Income
3	7352	Leicester	26.5%	$97,821	0.0%	Minority
3	7365	Auburn	10.1%	$44,773	0.0%	Income
1	7372	Millbury	16.7%	$53,875	0.0%	Income
2	7372	Millbury	13.7%	$53,375	0.0%	Income
2	8201	Ware	13.9%	$41,731	0.0%	Income
3	8201	Ware	24.5%	$33,889	2.6%	Minority and income
1	8203	Amherst	28.5%	$118,250	1.6%	Minority
1	8207	Amherst	44.5%	$36,168	2.8%	Minority and income
Within 5 Miles						
1	407.01	Montague	18.4	$40,491	0.0%	Income
2	407.01	Montague	23.1	$25,339	1.5%	Income
4	407.01	Montague	15.7	$54,696	0.0%	Income
1	407.02	Montague	6.9	$40,000	1.9%	Income
1	411	Greenfield	8.7	$52,315	2.4%	Income
1	412	Greenfield	13.0	$54,432	0.0%	Income
3	412	Greenfield	12.1	$51,435	5.3%	Income
1	413.01	Greenfield	21.4	$40,204	3.9%	Income
2	413.01	Greenfield	20.4	$44,091	4.1%	Income
3	413.01	Greenfield	17.5	$43,472	0.0%	Income
1	413.02	Greenfield	14.5	$21,792	0.0%	Income
2	413.02	Greenfield	15.8	$41,146	2.5%	Income
1	414	Greenfield	39.9	$24,688	2.9%	Minority and income

Block Group	Census Tract	Municipality	Minority Population (%)	Median Household Income ($)	English Isolation (%)	EJ Criteria Met
2	414	Greenfield	24.8	$47,404	9.0%	Minority and income
2	7307	Worcester	32.3	$98,269	0.0%	Minority
3	7307	Worcester	34.1	$44,099	0.0%	Minority and income
4	7307	Worcester	36.8	$81,708	5.5%	Minority
2	7308.02	Worcester	29.3	$80,300	7.9%	Minority
2	7309.01	Worcester	28.9	$69,306	15.5%	Minority
1	7309.02	Worcester	26.4	$98,073	0.0%	Minority
2	7309.02	Worcester	35.9	$72,667	11.9%	Minority
3	7309.02	Worcester	24.6	$101,750	0.0%	Minority
1	7310.01	Worcester	48.9	$82,917	8.7%	Minority
1	7310.02	Worcester	47.9	$63,115	5.5%	Minority
2	7310.02	Worcester	57.9	$41,745	10.1%	Minority and income
3	7310.02	Worcester	50.9	$48,705	9.7%	Minority and income
4	7310.02	Worcester	60.5	$0	7.6%	Minority
1	7311.01	Worcester	67.9	$30,238	18.8%	Minority and income
2	7311.01	Worcester	62.1	$53,147	4.6%	Minority and income
3	7311.01	Worcester	33.8	$50,568	1.5%	Minority and income
4	7311.01	Worcester	66.3	$40,847	11.2%	Minority and income
1	7311.02	Worcester	26.4	$118,594	0.0%	Minority
2	7311.02	Worcester	50.7	$46,964	9.6%	Minority and income
3	7311.02	Worcester	36.2	$118,750	0.0%	Minority
1	7312.02	Worcester	27.6	$0	0.0%	Minority
1	7312.03	Worcester	73.7	$14,852	16.8%	Minority and income
2	7312.03	Worcester	59.5	$32,567	5.6%	Minority and income
3	7312.03	Worcester	67.4	$39,276	29.4%	Minority, income and English isolation
4	7312.03	Worcester	66.9	$41,058	0.0%	Minority and income
1	7312.04	Worcester	73.3	$44,784	10.6%	Minority and income
2	7312.04	Worcester	73.9	$31,406	10.1%	Minority and income
1	7313	Worcester	80.8	$16,719	12.1%	Minority and income
2	7313	Worcester	88.6	$37,548	42.6%	Minority, income and English isolation
3	7313	Worcester	78.0	$38,333	19.3%	Minority and income
1	7314	Worcester	84.9	$14,744	25.5%	Minority, income and English isolation
2	7314	Worcester	79.1	$22,778	30.7%	Minority, income and English isolation
3	7314	Worcester	74.8	$47,419	17.2%	Minority and income

Block Group	Census Tract	Municipality	Minority Population (%)	Median Household Income ($)	English Isolation (%)	EJ Criteria Met
4	7314	Worcester	85.4	$46,908	0.0%	Minority and income
5	7314	Worcester	77.7	$27,981	0.0%	Minority and income
1	7315	Worcester	84.3	$16,319	19.4%	Minority and income
2	7315	Worcester	68.9	$14,179	18.1%	Minority and income
3	7315	Worcester	79.9	$39,240	4.2%	Minority and income
4	7315	Worcester	84.9	$0	9.9%	Minority
5	7315	Worcester	62.6	$0	14.9%	Minority
1	7316.01	Worcester	48.4	$17,012	9.9%	Minority and income
2	7316.01	Worcester	65.8	$41,481	7.1%	Minority and income
3	7316.01	Worcester	48.1	$40,984	23.2%	Minority and income
4	7316.01	Worcester	35.1	$25,772	0.0%	Minority and income
2	7316.02	Worcester	34.4	$25,921	25.2%	Minority, income and English isolation
1	7317	Worcester	49.4	$32,813	20.8%	Minority and income
2	7317	Worcester	46.1	$34,856	11.6%	Minority and income
3	7317	Worcester	61.0	$40,993	9.1%	Minority and income
2	7318.01	Worcester	50.4	$15,176	29.2%	Minority, income and English isolation
1	7318.02	Worcester	60.9	$43,583	23.2%	Minority and income
2	7318.02	Worcester	91.9	$11,543	33.9%	Minority, income and English isolation
4	7318.02	Worcester	69.2	$33,203	51.1%	Minority, income and English isolation
2	7322.01	Worcester	47.6	$76,250	12.2%	Minority
1	7322.02	Worcester	41.9	$51,163	23.5%	Minority and income
2	7322.02	Worcester	38.9	$92,344	9.1%	Minority
1	7322.03	Worcester	56.7	$75,401	25.9%	Minority and English isolation
2	7322.03	Worcester	51.8	$68,902	33.4%	Minority and English isolation
3	7322.03	Worcester	68.8	$39,732	14.6%	Minority and income
1	7323.01	Worcester	42.7	$61,607	4.6%	Minority
2	7323.01	Worcester	35.1	$68,795	4.7%	Minority
1	7323.02	Worcester	56.1	$39,207	14.8%	Minority and income
2	7323.02	Worcester	46.0	$77,561	21.7%	Minority
1	7324	Worcester	64.5	$60,851	4.3%	Minority
2	7324	Worcester	64.7	$66,250	14.1%	Minority
3	7324	Worcester	76.3	$37,964	29.2%	Minority, income and English isolation
4	7324	Worcester	75.7	$52,621	14.8%	Minority and income
5	7324	Worcester	82.5	$31,406	34.6%	Minority, income and English isolation

Block Group	Census Tract	Municipality	Minority Population (%)	Median Household Income ($)	English Isolation (%)	EJ Criteria Met
6	7324	Worcester	73.0	$35,217	8.7%	Minority and income
1	7325	Worcester	60.4	$29,886	8.7%	Minority and income
2	7325	Worcester	75.3	$32,845	10.9%	Minority and income
1	7326	Worcester	72.9	$22,578	33.5%	Minority, income and English isolation
2	7326	Worcester	71.4	$51,458	19.1%	Minority and income
3	7326	Worcester	60.7	$58,958	0.0%	Minority
4	7326	Worcester	64.1	$60,047	2.6%	Minority
5	7326	Worcester	71.9	$37,839	43.5%	Minority, income and English isolation
1	7327	Worcester	60.8	$24,044	14.8%	Minority and income
2	7327	Worcester	68.4	$53,750	3.0%	Minority and income
3	7327	Worcester	68.0	$47,788	9.4%	Minority and income
4	7327	Worcester	67.5	$28,997	0.0%	Minority and income
1	7328.01	Worcester	32.9	$77,821	1.7%	Minority
2	7328.01	Worcester	42.8	$70,766	5.4%	Minority
1	7328.02	Worcester	41.8	$63,676	10.4%	Minority
2	7328.02	Worcester	57.4	$73,250	8.7%	Minority
3	7328.02	Worcester	64.5	$0	13.1%	Minority
1	7329.01	Worcester	51.4	$32,768	8.8%	Minority and income
2	7329.01	Worcester	51.8	$63,737	7.6%	Minority
3	7329.01	Worcester	54.5	$71,458	14.7%	Minority
4	7329.01	Worcester	39.5	$64,798	5.4%	Minority
5	7329.01	Worcester	59.0	$12,080	17.7%	Minority and income
1	7329.02	Worcester	31.1	$0	0.0%	Minority
1	7330	Worcester	77.9	$41,667	0.0%	Minority and income
2	7330	Worcester	64.7	$41,369	6.7%	Minority and income
3	7330	Worcester	81.2	$33,799	14.5%	Minority and income
1	7331.01	Worcester	46.5	$57,500	6.5%	Minority
2	7331.01	Worcester	37.3	$66,369	0.0%	Minority
1	7331.02	Worcester	57.3	$43,696	8.3%	Minority and income
2	7331.02	Worcester	41.9	$74,712	7.6%	Minority
1	7352	Leicester	26.0	$103,021	0.0%	Minority
2	7381	Grafton	28.0	$67,273	0.0%	Minority
3	7381	Grafton	35.8	$127,619	0.0%	Minority
2	7391.01	Shrewsbury	32.1	$72,425	0.0%	Minority

Block Group	Census Tract	Municipality	Minority Population (%)	Median Household Income ($)	English Isolation (%)	EJ Criteria Met
3	7391.01	Shrewsbury	44.4	$131,200	2.8%	Minority
1	7391.02	Shrewsbury	57.2	$148,523	0.0%	Minority
2	7391.02	Shrewsbury	58.2	$100,313	11.8%	Minority
1	7601	Brookfield	7.4	$34,779	0.0%	Income
1	7611	Warren	10.5	$50,128	0.0%	Income
3	7611	Warren	12.8	$48,711	0.0%	Income
2	8102	Palmer	10.2	$47,163	2.3%	Income
3	8201.01	Ware	13.9	$41,731	0.0%	Income
2	8203	Amherst	51.4	$37,500	5.7%	Minority and income
3	8203	Amherst	58.4	$67,778	3.9%	Minority
4	8203	Amherst	33.4	$75,882	3.8%	Minority
5	8203	Amherst	45.1	$61,429	4.9%	Minority
1	8204	Amherst	39.5	$2,500	0.0%	Minority and income
1	8205	Amherst	28.9	$54,609	0.0%	Minority and income
2	8205	Amherst	24.8	$106,190	5.0%	Minority
3	8205	Amherst	36.9	$22,936	0.0%	Minority and income
4	8205	Amherst	25.9	$16,226	0.0%	Minority and income
5	8205	Amherst	30.7	$74,018	1.2%	Minority
6	8205	Amherst	41.9	$40,956	2.3%	Minority and income
1	8206	Amherst	52.4	$0	0.0%	Minority
2	8207	Amherst	40.0	$62,321	9.1%	Minority
3	8207	Amherst	27.7	$140,000	3.6%	Minority
3	8208.01	Amherst	60.3	$47,435	5.6%	Minority and income
4	8208.01	Amherst	40.5	$89,712	14.7%	Minority

Source: Executive Office of Energy and Environmental Affairs (“EEA”) Geographic Information Systems (“MassGIS”), Massachusetts 2020 Environmental Justice Populations. Updated November 12, 2022.

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B. Identify all languages identified in the "Languages Spoken in Massachusetts" tab of the EJ Maps Viewer as spoken by 5 percent or more of the EJ population who also identify as not speaking English "very well." The languages should be identified for each census tract located in whole or in part within 1 mile and 5 miles of the project site, regardless of whether such census tract contains any designated EJ populations.

There are no census tracts with languages spoken by 5 percent or more of the population who also identify as not speaking English "very well" or "at all" within the 1-mile DGA of the Project ROW. **Table 13** below shows languages spoken by at least 5 percent of the census Tract population within 5 miles of the Project ROW.

Table 13: Languages Spoken By At Least 5 Percent Of The Census Tract Population

Census Tract	Municipality	Language Spoken (%)
7327	Worcester	Spanish or Spanish Creole: 7.5%
7311.02	Worcester	Spanish or Spanish Creole: 6.3%, Other IndoEuropean language: 11.6%
7316	Worcester	Chinese: 6%
7323.02	Worcester	Spanish or Spanish Creole: 6.9%
7324	Worcester	Spanish or Spanish Creole: 11.2%
7310.02	Worcester	Spanish or Spanish Creole: 4.5%, Vietnamese: 7.8%
7317	Worcester	Spanish or Spanish Creole: 9.1%
7330	Worcester	Spanish or Spanish Creole: 17.4%, Vietnamese: 5.5%
7310.01	Worcester	Spanish or Spanish Creole: 8.8%, Other IndoEuropean language: 8.3%
7312.03	Worcester	Spanish or Spanish Creole: 16.6%, Vietnamese: 6.1%
7313	Worcester	Spanish or Spanish Creole: 23.4%, Vietnamese: 8.5%
7314	Worcester	Spanish or Spanish Creole: 24.2%, Other Indic language: 6.5%
8208.01	Amherst	Chinese: 7.8%
7322.03	Worcester	Spanish or Spanish Creole: 7.5%, Vietnamese: 4.5%, Other Asian language: 4.8%
7325	Worcester	Spanish or Spanish Creole: 18.5%
7331.01	Worcester	Spanish or Spanish Creole: 5%, Vietnamese: 7%
7315	Worcester	Spanish or Spanish Creole: 31.3%
7331.02	Worcester	Spanish or Spanish Creole: 8.5%, Vietnamese: 7.1%
7311.01	Worcester	Spanish or Spanish Creole: 8.4%
7318	Worcester	Spanish or Spanish Creole: 15.9%
7326	Worcester	Spanish or Spanish Creole: 11.5%
7312.04	Worcester	Spanish or Spanish Creole: 21.5%, Vietnamese: 8.3%

Source: Executive Office of Energy and Environmental Affairs ("EEA") Geographic Information Systems ("MassGIS"), Massachusetts 2020 Environmental Justice Populations. Updated November 12, 2022.

C. If the list of languages identified under Section I.B. has been modified with approval of the EEA EJ Director, provide a list of approved languages that the project will use to provide public involvement opportunities during the course of MEPA review. If the list has been expanded by the Proponent (without input from the EEA EJ Director), provide a list of the additional languages that will be used to provide public involvement opportunities during the course of MEPA review as required by Part II of the MEPA Public Involvement Protocol for Environmental Justice Populations ("MEPA EJ Public Involvement Protocol"). If the project is exempt from Part II of the protocol, please specify.

Not Applicable

II. Potential Effects on EJ Populations

A. If an EJ population has been identified using the EJ Maps Viewer within 1 mile of the project site, describe the likely effects of the project (both adverse and beneficial) on the identified EJ population(s).

The Project will occur within the existing ROW, thereby minimizing adverse environmental impacts. Due to the nature of the Project, outage constraints in the region, and NEP's efforts to reduce impacts to the natural and human environment, Project activities will be sequenced in both the mainline and Tap Lines. No long-term impacts on soil, bedrock, vegetation, surface water, groundwater, wetland resources or air quality will occur.

The Project is anticipated to have temporary and short-term impacts on the air quality, water quality, land protection and open space, noise, and traffic related to construction; however, following implementation of BMPs, there are no anticipated adverse effects on the identified EJ populations.

B. If an EJ population has been identified using the EJ Maps Viewer within 5 miles of the project site, will the project: (i) meet or exceed MEPA review thresholds under 301 CMR 11.03(8)(a)-(b) __ Yes X No; **or (ii) generate 150 or more new average daily trips (adt) of diesel vehicle traffic, excluding public transit trips, over a duration of 1 year or more.** ___ Yes X No

C. If you answered "Yes" to either question in Section II.B., describe the likely effects of the project (both adverse and beneficial) on the identified EJ population(s).

Not Applicable.

III. Public Involvement Activities

A. Provide a description of activities conducted prior to filing to promote public involvement by EJ populations, in accordance with Part II of the MEPA EJ Public Involvement Protocol. In particular:

1. If advance notification was provided under Part II.A., attach a copy of the Environmental Justice Screening Form and provide list of CBOs/tribes contacted (with dates). Copies of email correspondence can be attached in lieu of a separate list.

Refer to **Attachment D: Environmental Justice**

2. State how CBOs and tribes were informed of ways to request a community meeting, and if any meeting was requested. If public meetings were held, describe any issues of concern that were raised at such meetings, and any steps taken (including modifications to the project design) to address such concerns.

All contacts on the EJ Reference List were provided Advanced Notification of the Project via the EJ Screening Form, which contained information on how to request a meeting or additional Project materials. The EJ Reference List and municipality administrators were also notified by email of a virtual community meeting held on December 19th, and the community was notified via meeting advertisements in three newspapers: the Worcester Telegram and Gazette, the Greenfield Reporter, and the Republican.

3. If the project is exempt from Part II of the protocol, please specify.

N/A

B. Provide below (or attach) a distribution list (if different from the list in Section III.A. above) of CBOs and tribes, or other individuals or entities the Proponent intends to maintain for the notice of the MEPA Site Visit and circulation of other materials and notices during MEPA review.

Refer to **Attachment B: ENF Distribution List**

C. Describe (or submit as a separate document) the Proponent's plan to maintain the same level of community engagement throughout the MEPA review process, as conducted prior to filing.

NEP will maintain the distribution list of contacts from the EJ Reference List and any additional contacts that are identified during the virtual meetings and public engagement process. Contacts will receive notifications of the MEPA site visit, summaries of supplemental information submitted to the MEPA office and any other relevant notices or materials issued during the course of the MEPA review. NEP will continue to host a Project website. A Project video will be created and made available on the Project website post-ENF filing.

CERTIFICATIONS:

1. **The Public Notice of Environmental Review has been/will be published in the following newspapers in accordance with 301 CMR 11.15(1):**

Worcester Telegram and Gazette	**12/16/2024**
Greenfield Recorder	**12/16/2024**
The Republican	**12/16/2024**

2. **This form has been circulated to Agencies and Persons in accordance with 301 CMR 11.16(2).**

Signatures:

Date	**Signature of Responsible Officer or Proponent**	**Date**	**Signature of person preparing ENF (if different from above)**

Mike Tyrrell	**Priyanka Shrestha**
Name (print or type)	**Name (print or type)**
New England Power Company (NEP)	**BSC Group Inc.**
Firm/Agency	**Firm/Agency**
170 Data Drive	**1 Mercantile Street**
Street	**Street**
Waltham, MA, 02451	**Worcester/MA/01608**
Municipality/State/Zip	**Municipality/State/Zip**
603-801-4140	**617-896-4570**
Phone	**Phone**

Appendix A - Figures

Environmental Notification Form (ENF)

Central To Western Massachusetts Energy Improvement Project

Figure 1 – Locus map

Figure 2 – MEPA ER Map

Figure 3 – Water Supply Protection Areas

Figure 4 – Cross Section

Appendix A – Figures
Figure 1 USGS Site Location Map

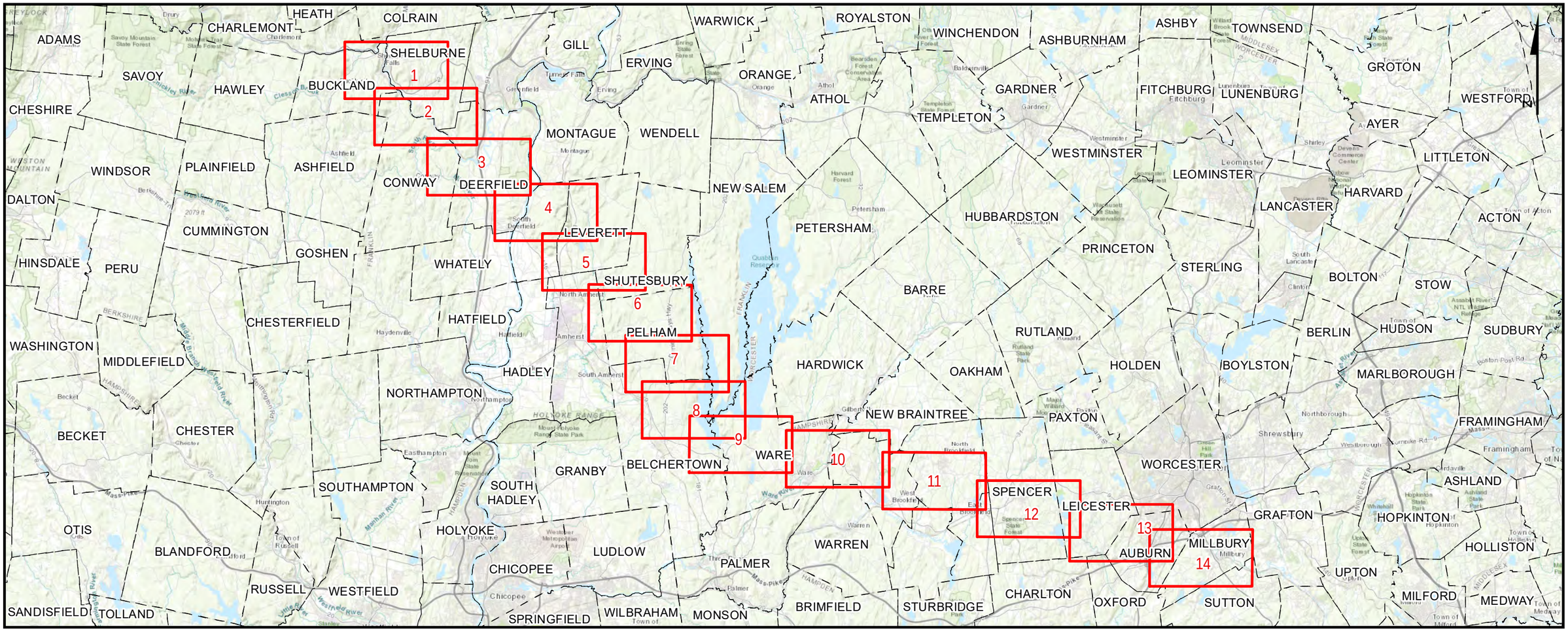
BSC Project Number: 100181.00

Central to Western Massachusetts Energy Improvement Project

USGS Site Location Map

Shelburne, Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn & Millbury, MA

December 18, 2024



PREPARED FOR:

nationalgrid

170 Data Drive
Waltham, MA 02451

INDEX OF FIGURES

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1 - 14 - MAP SHEETS

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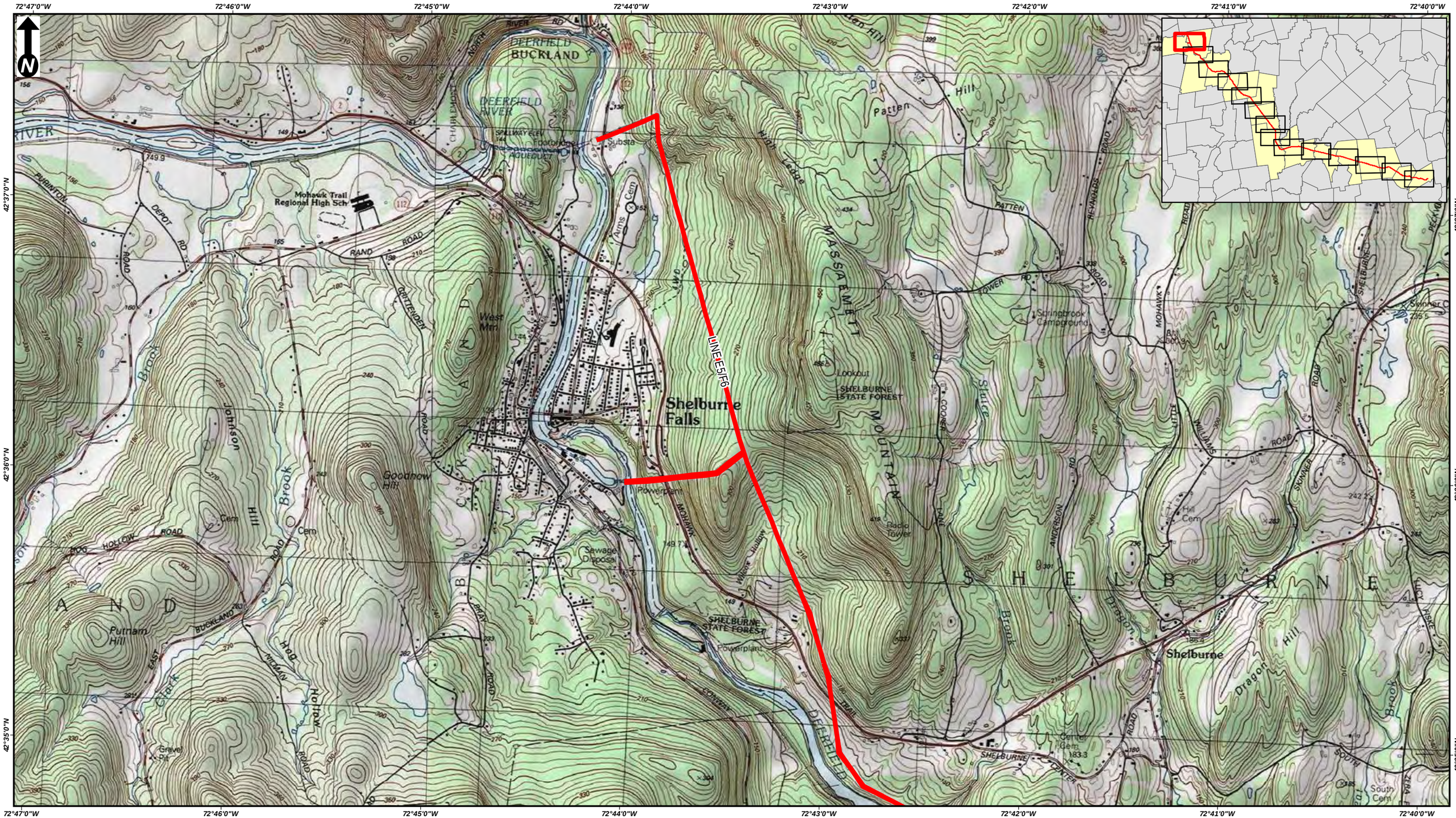

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT
USGS Site Location Map
Shelburne, MA
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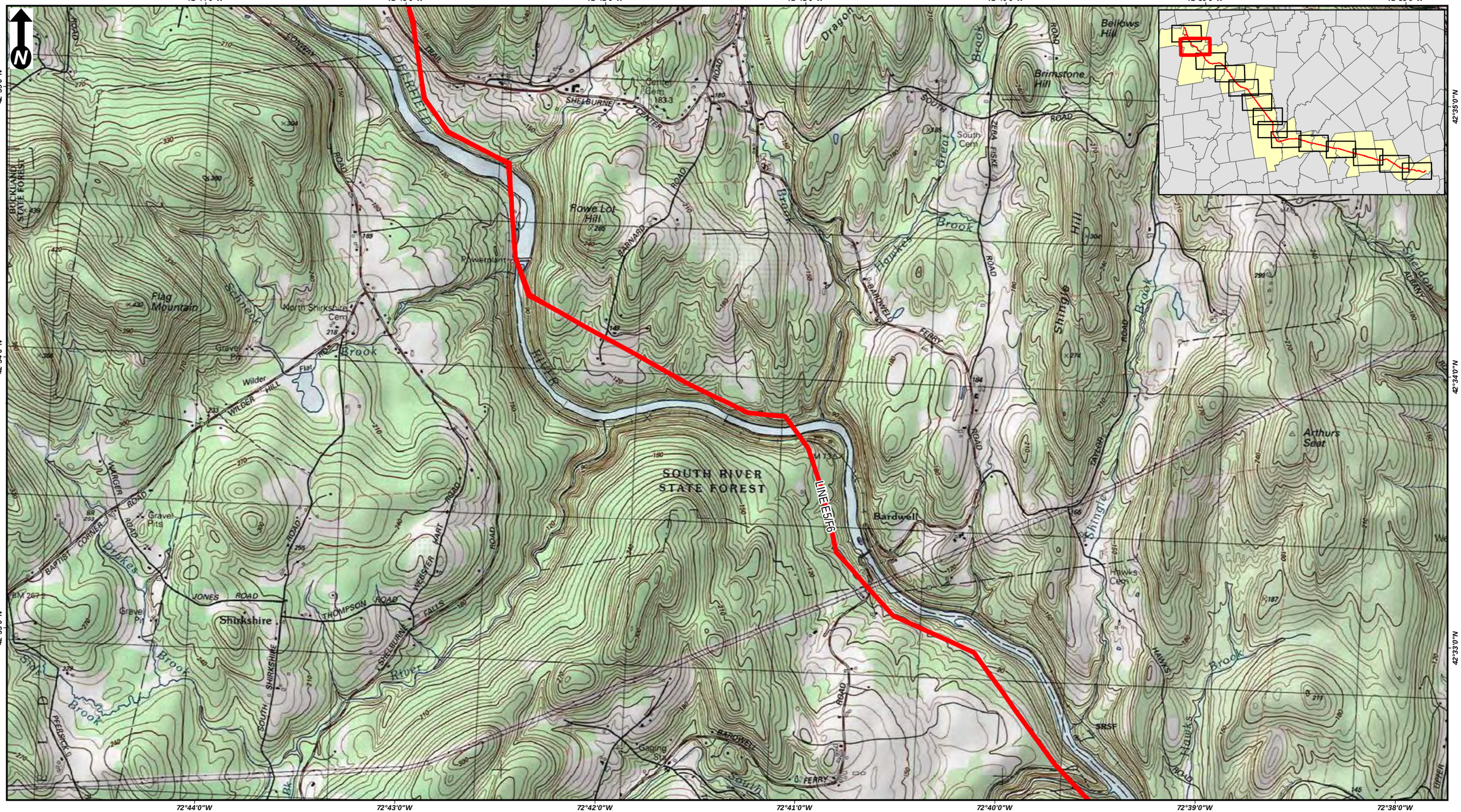

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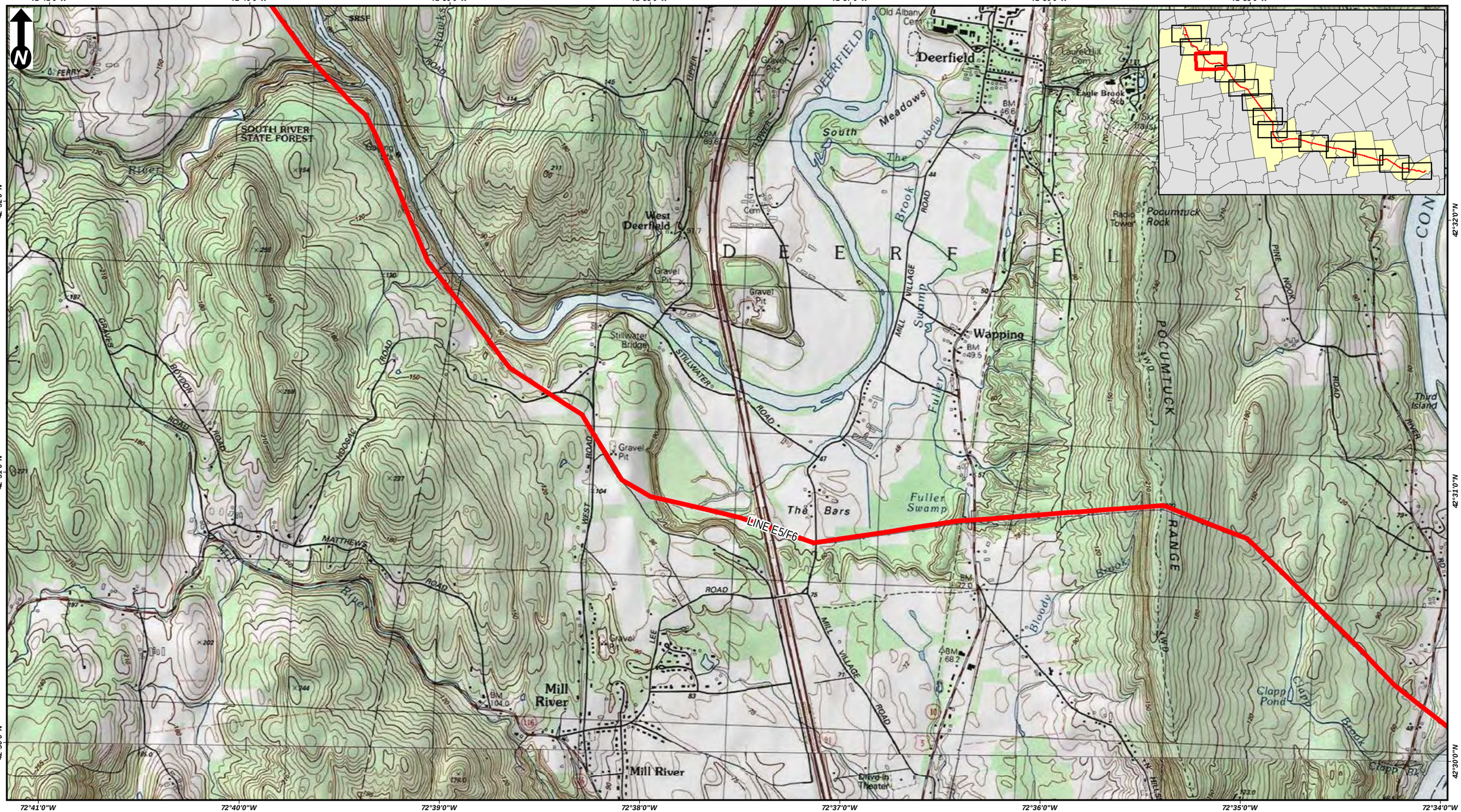

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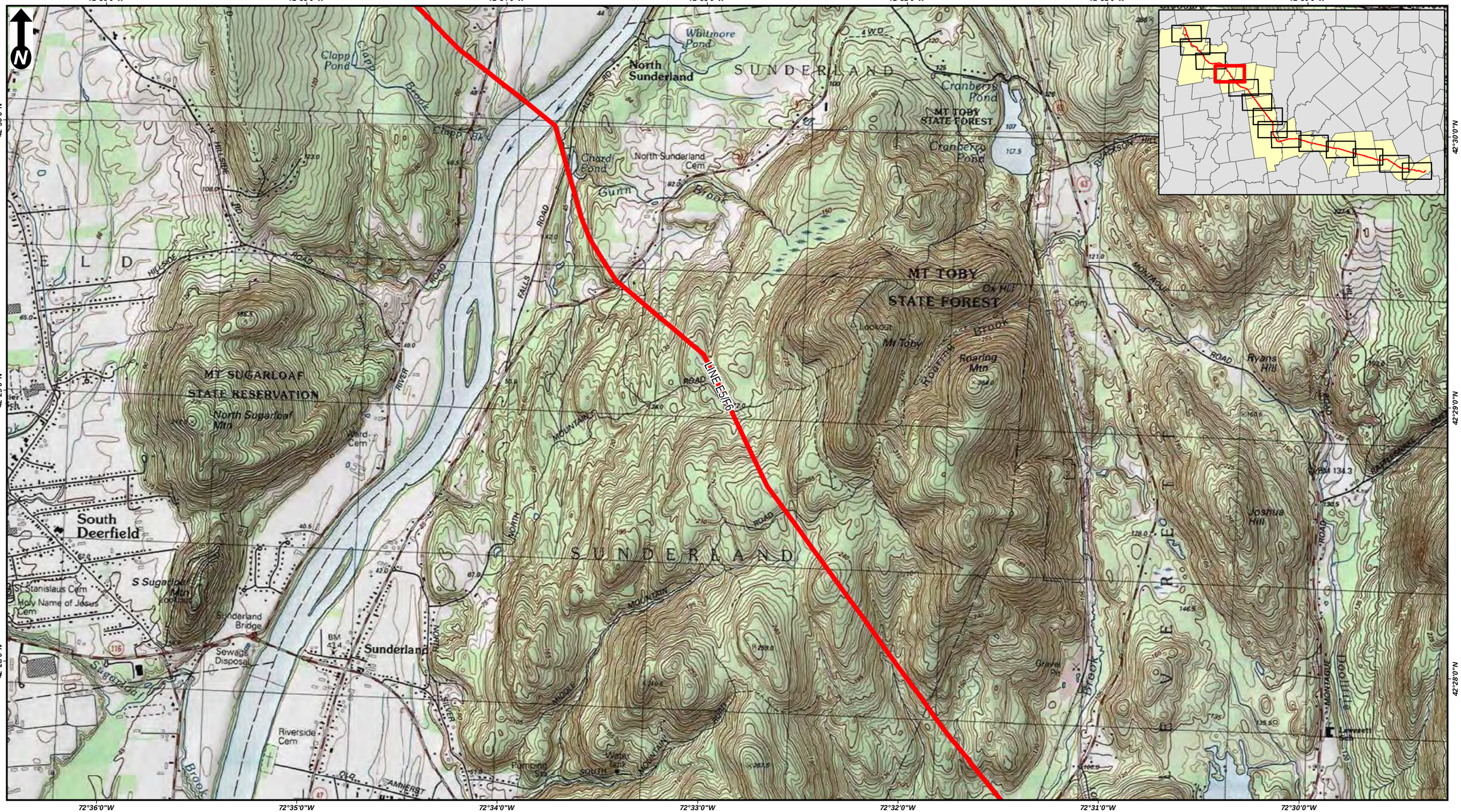

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USGS Site Location Map
Deerfield, Sunderland, & Leverett, MA
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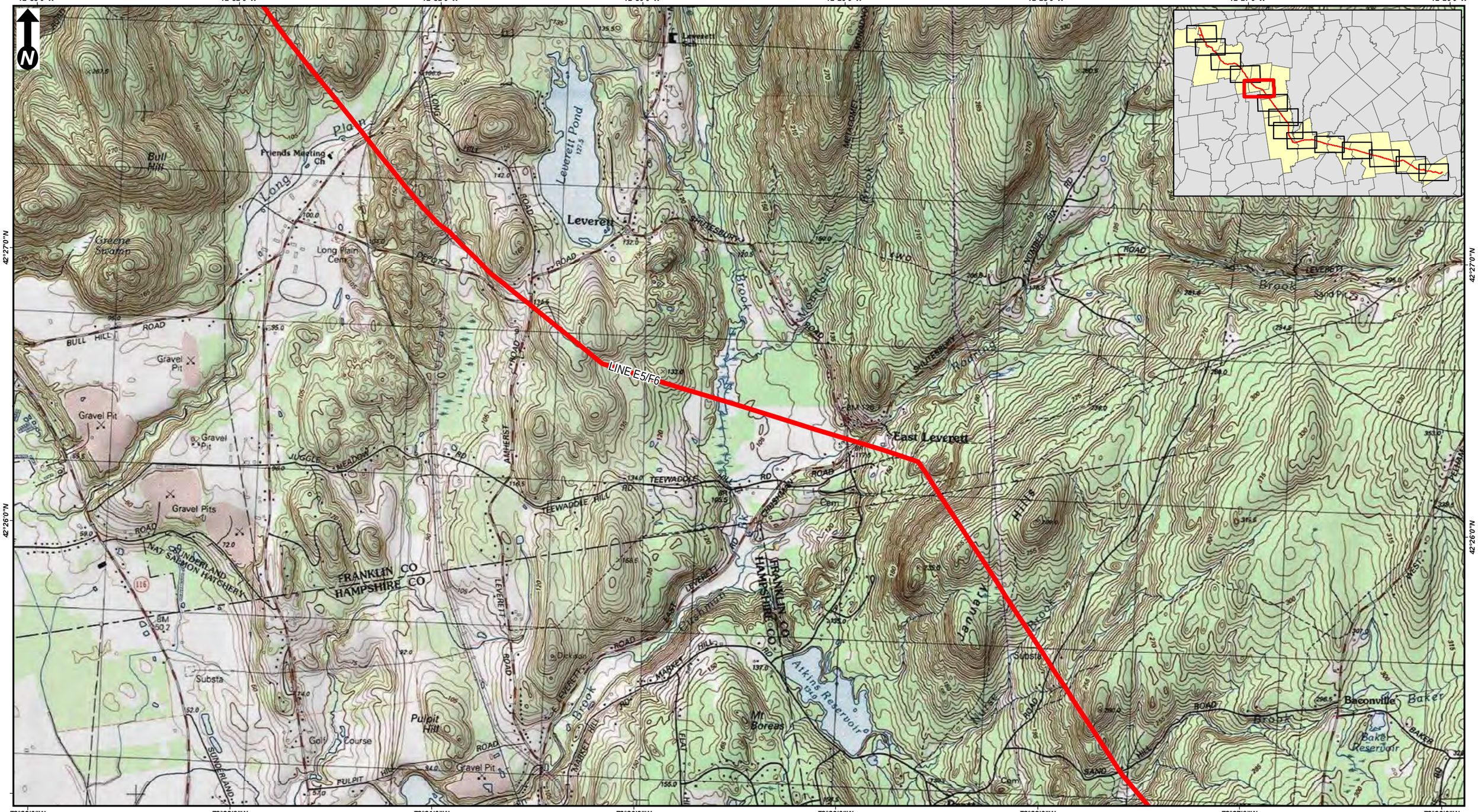

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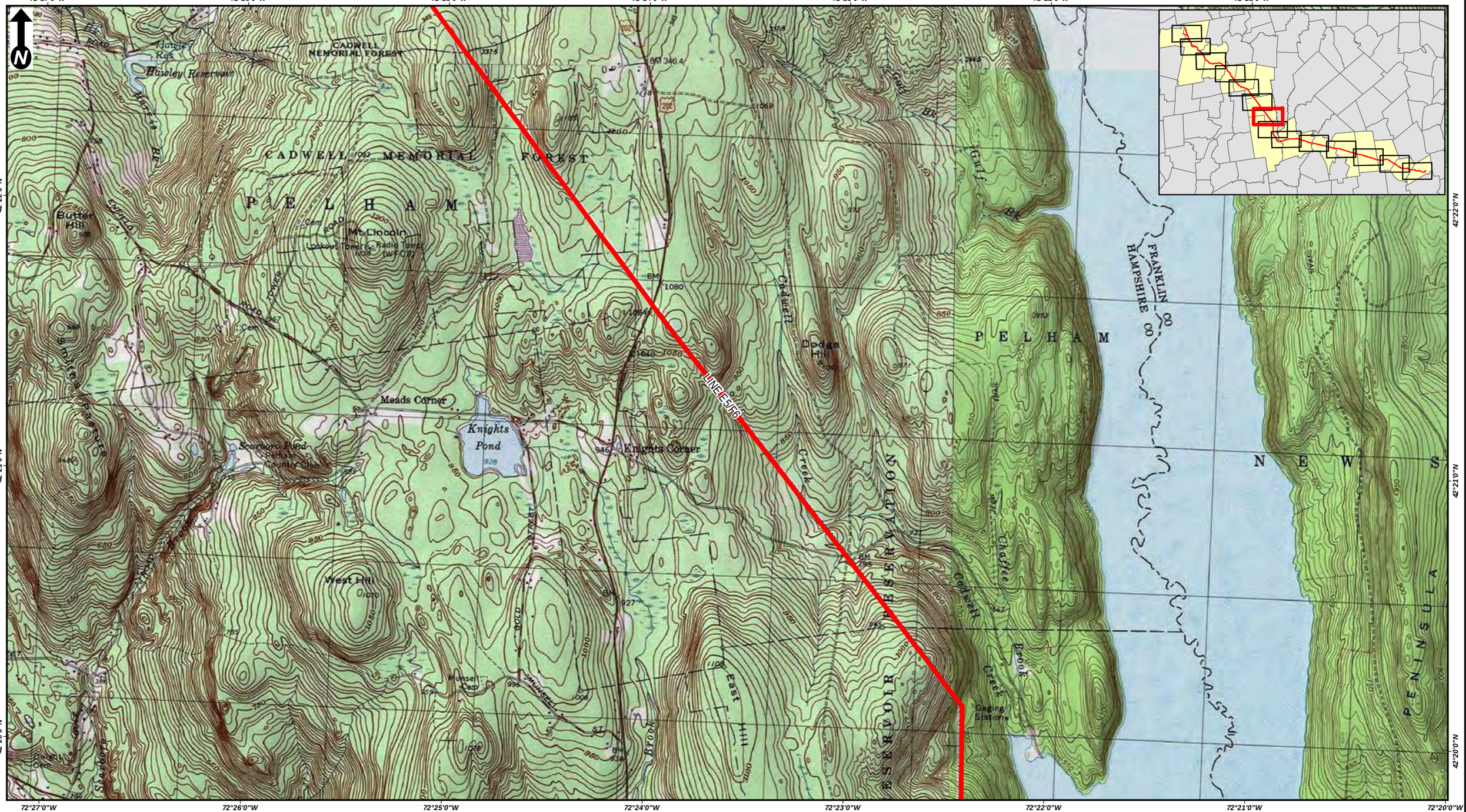

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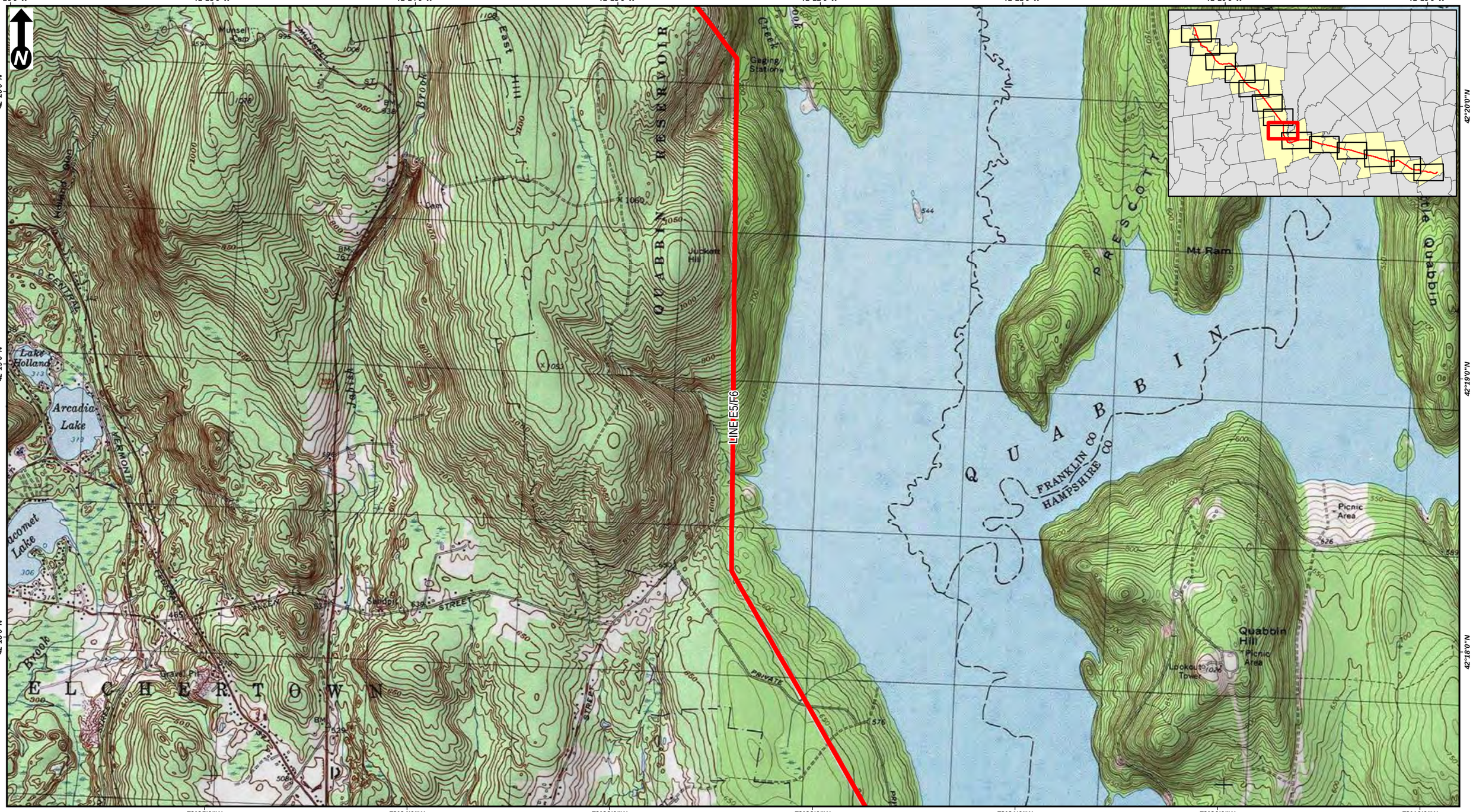

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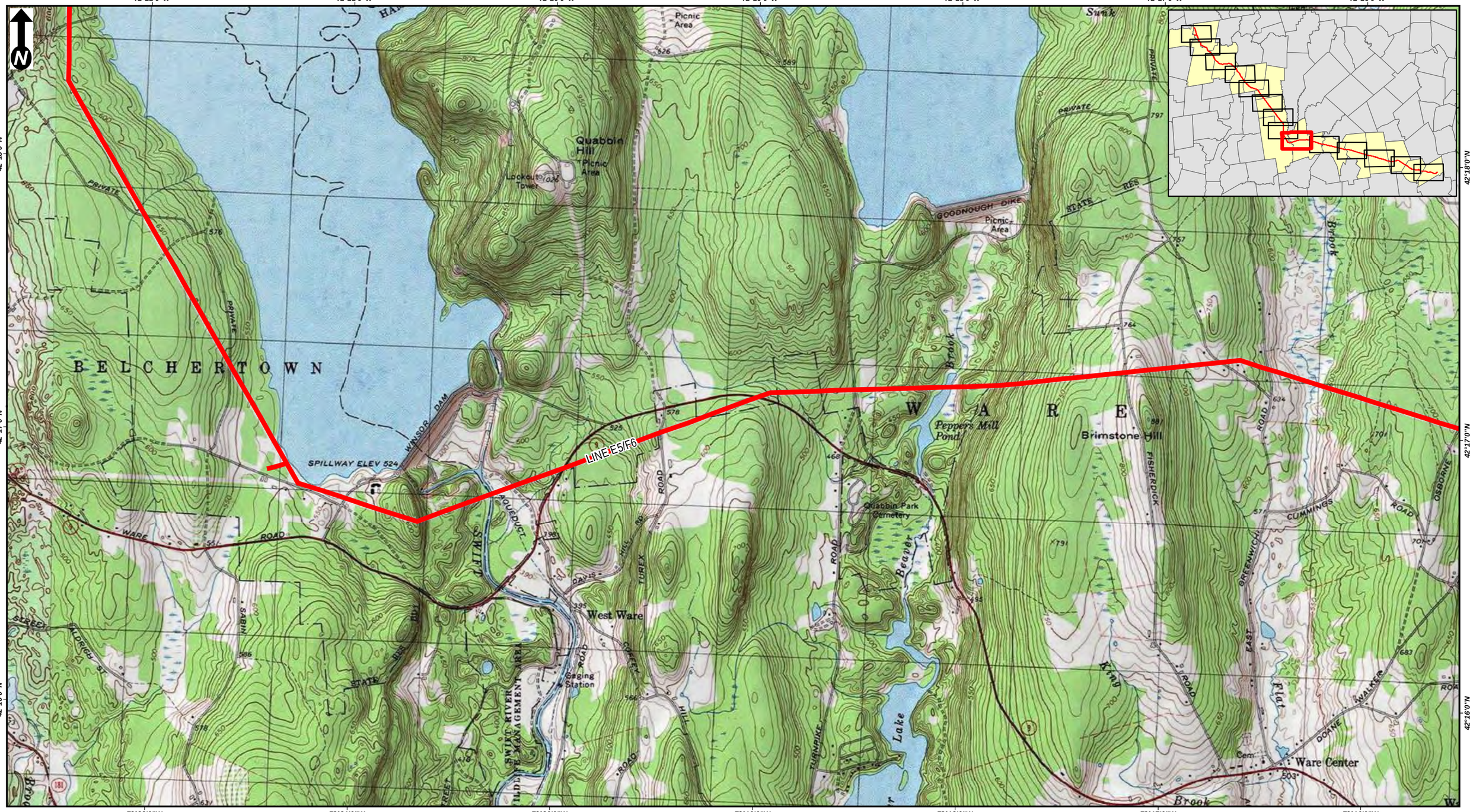

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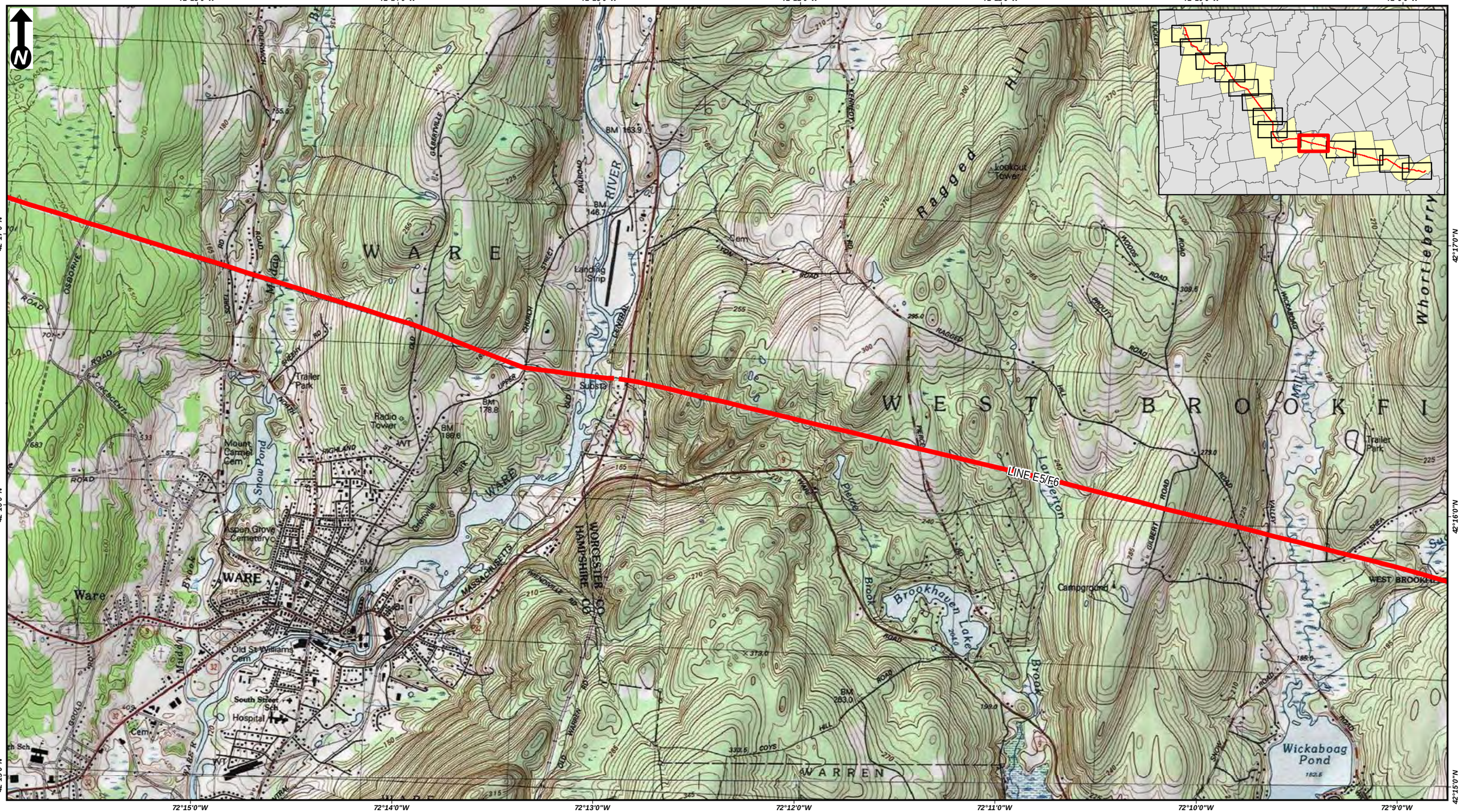

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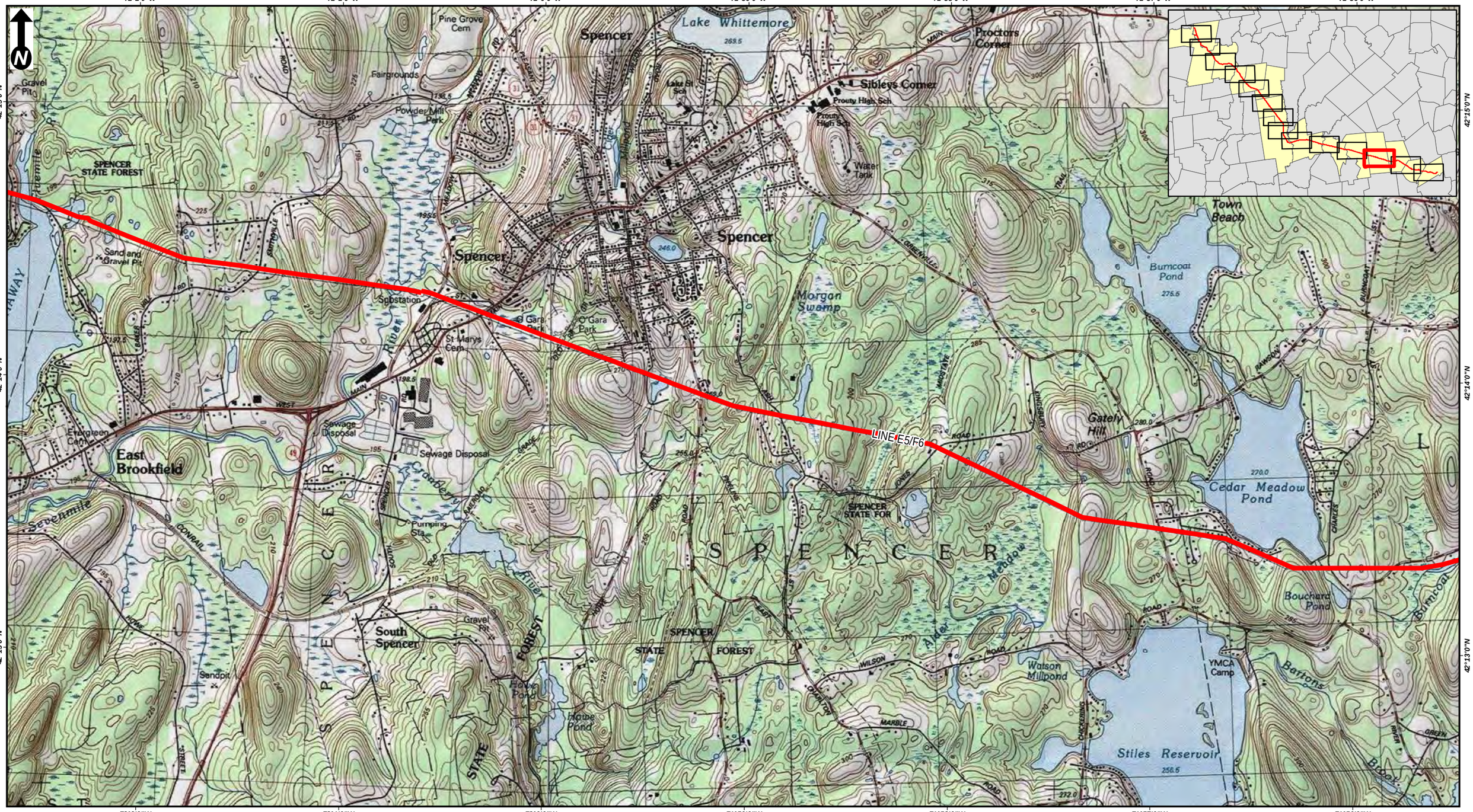

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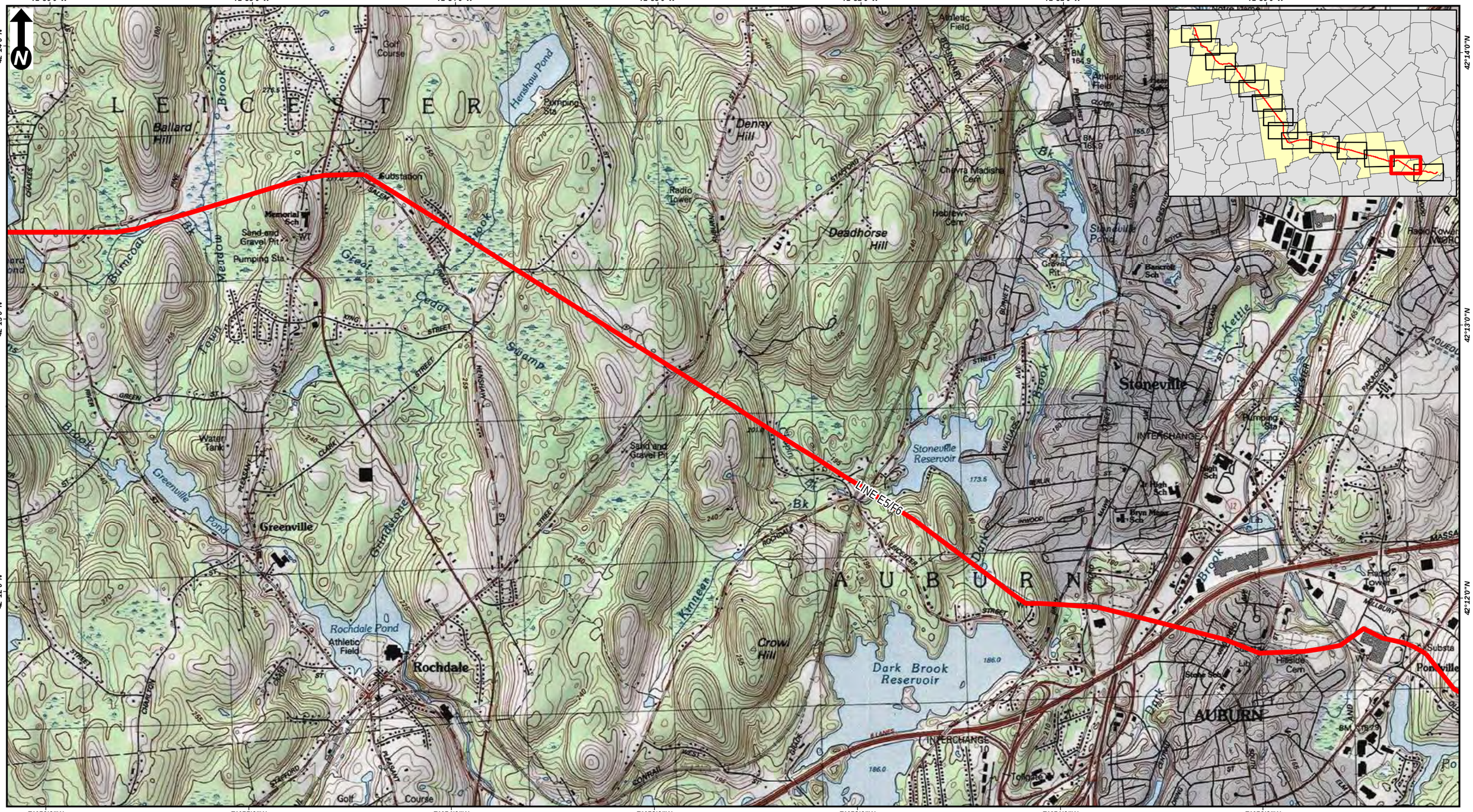

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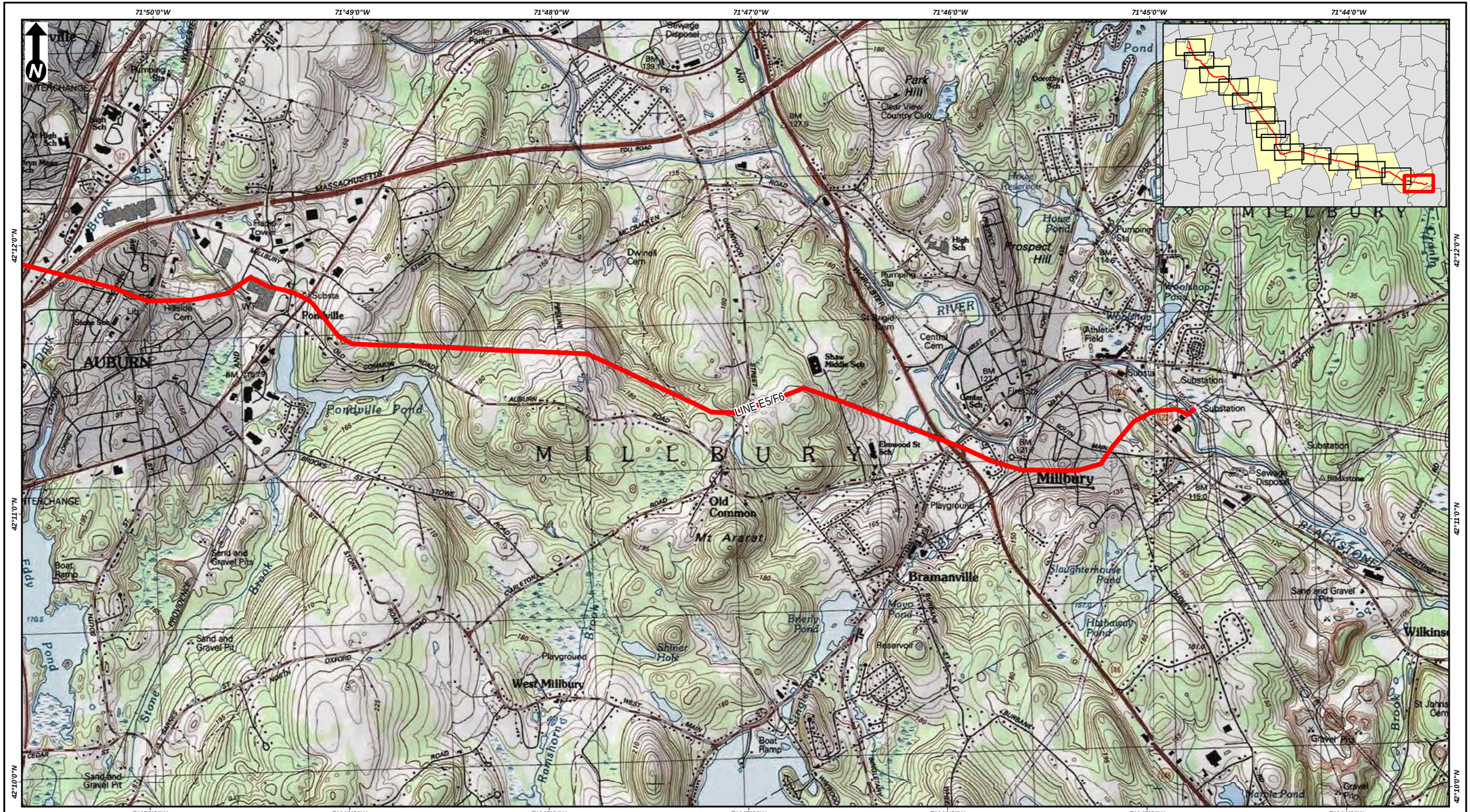

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Appendix A – Figures and Plans
Figure 2 MEPA ER Map

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BSC Project Number: 100181.00

Central to Western Massachusetts Energy Improvement Project

Shelburne, Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn & Millbury, MA

MEPA General Purpose Plans - 75% Design

December 20, 2024

PREPARED FOR:

nationalgrid

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INDEX OF FIGURES

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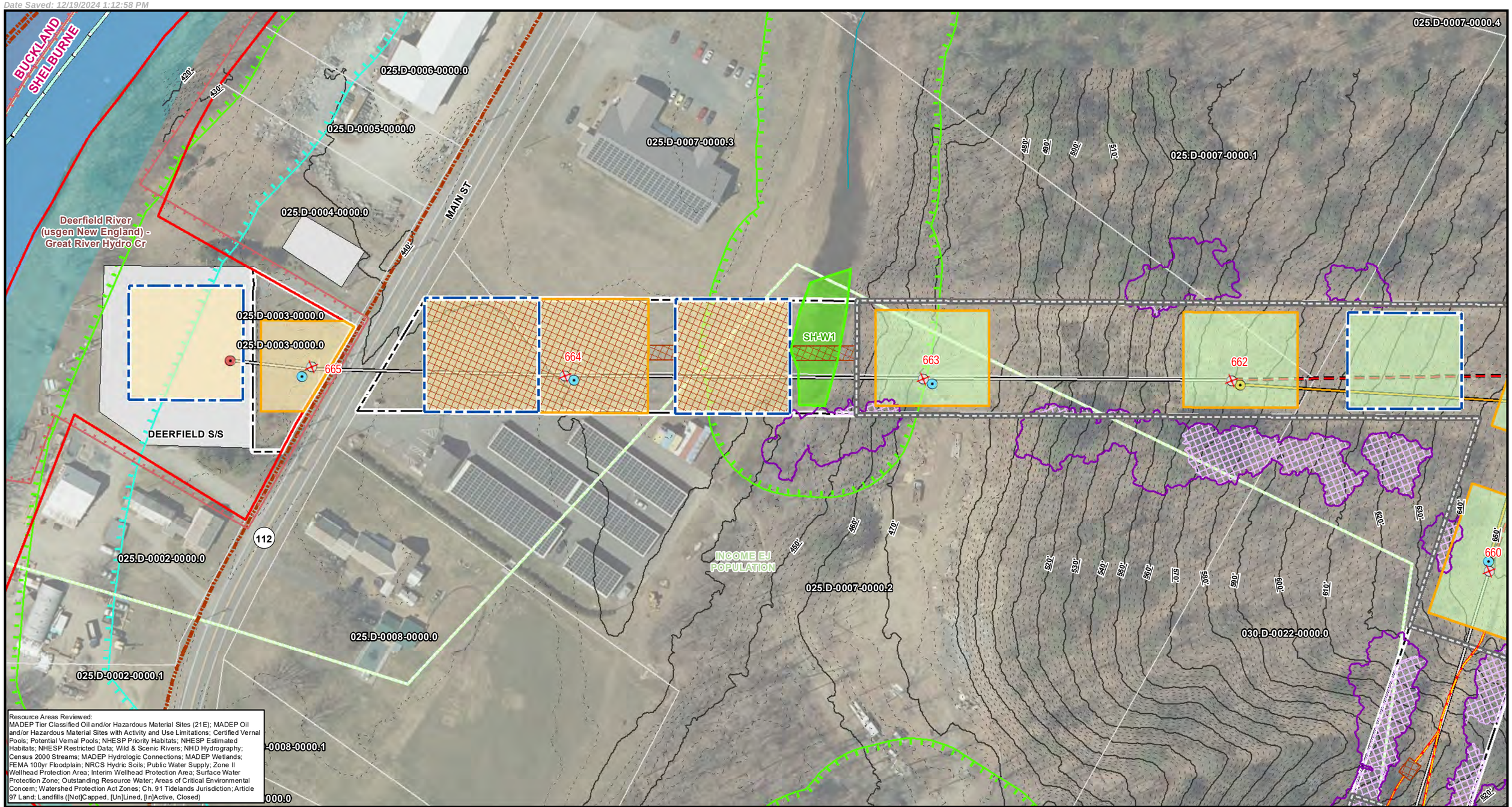
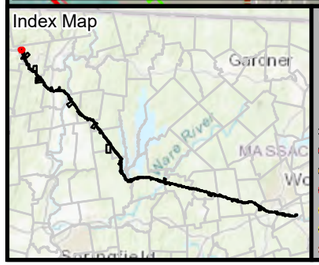


Resource Areas Reviewed:
MADEP Tier Classified Oil and/or Hazardous Material Sites (21E); MADEP Oil and/or Hazardous Material Sites with Activity and Use Limitations; Certified Vernal Pools; Potential Vernal Pools; NHESP Priority Habitats; NHESP Estimated Habitats; NHESP Restricted Data; Wild & Scenic Rivers; NHD Hydrography; Census 2000 Streams; MADEP Hydrologic Connections; MADEP Wetlands; FEMA 100yr Floodplain; NRCS Hydric Soils; Public Water Supply; Zone II Wellhead Protection Area; Interim Wellhead Protection Area; Surface Water Protection Zone; Outstanding Resource Water; Areas of Critical Environmental Concern; Watershed Protection Act Zones; Ch. 91 Tidelands Jurisdiction; Article 97 Land; Landfills ([Not]Capped, [Un]Lined, [In]Active, Closed)

Index Map



Legend

*Indicates Layers Set to Transparency

- Existing Structure
- Install Structure (Concrete Caisson)
- Install Structure (Direct Embed)
- Install Structure (Foundation TBD)
- Remove Structure
- Replace Overhead Line
- Remove Overhead Line
- Proposed Overhead Line
- Engineered Type 1-5 Access
- No Modifications Access
- Temporary Access
- Type R Access
- Type S Access
- Limit of Disturbance
- Construction Matting
- Work Envelope
- Temporary Work Area
- Pull Pad
- Specialized Equipment Required
- Edge of ROW
- National Grid Owned Property
- Field Delineated Wetland Lines
- Field Delineated Wetlands*
- Field Delineated Vernal Pool*
- Estimated Wetland
- Field Delineated Stream Centerline
- Field Delineated Inland Bank
- Field Delineated Ditch / Swale
- Estimated Inland Bank
- Estimated Stream Centerline
- Field Delineated Stream Area*
- Approximate Water Line
- Perennial Stream
- Coldwater Fisheries Resources
- MADEP Hydrologic Connections
- MADEP Wetlands*
- MADEP Open Water*
- 100ft Buffer to Wetlands and Streams
- 200ft Riverfront Area
- FEMA 100yr Floodplain*
- Outstanding Resource Water
- NHESP Priority & Estimated Habitats
- Watershed Protection Act Primary Zone
- Watershed Protection Act Secondary Zone
- Certified Vernal Pools
- Potential Vernal Pools
- Public Water Supply
- MADEP 21E Site
- MADEP AUL Site
- MHC Historic Point
- MHC Historic Area
- DCR Owned Property
- Culvert
- Catch Basin
- Access Gate
- Railroad
- Hiking Trails
- Approximate Pipeline
- 2ft Contour
- 10ft Contour
- Fenceline
- Guardrail
- Stonewall
- Existing Treeline
- Tree Removal
- Selective Tree Removal
- Pruning
- Town Boundary
- Parcel Boundaries

Article 97 Lands
- Private

Environmental Justice Populations 2020
- Income

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1 inch = 100 feet
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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Shelburne, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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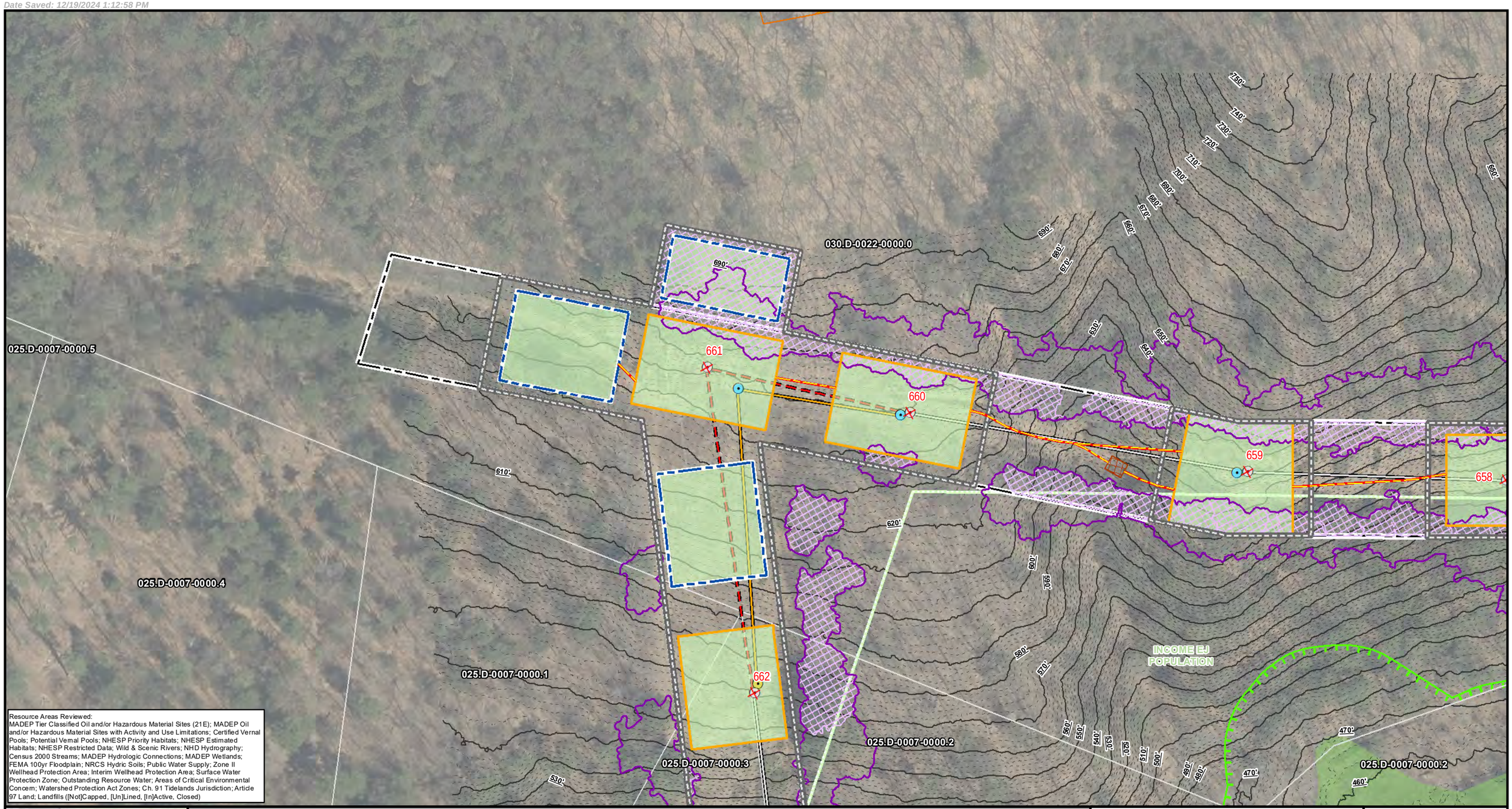

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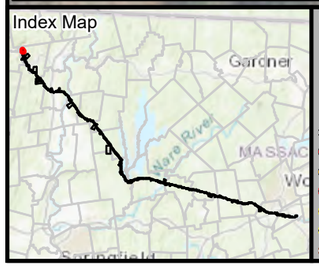

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Shelburne, MA

MassGIS
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SPAN STREAM

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INCOME EJ POPULATION

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Springfield

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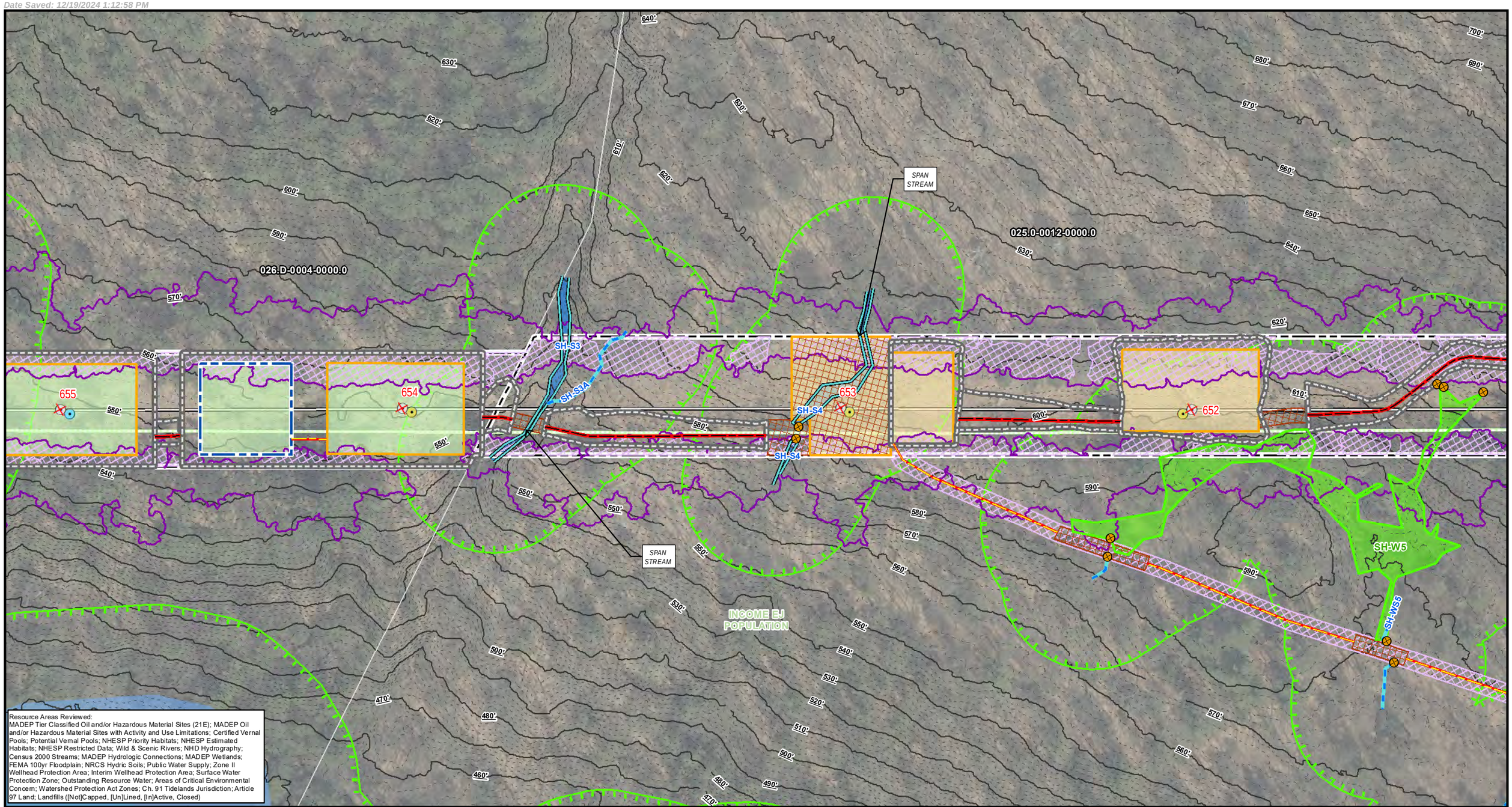

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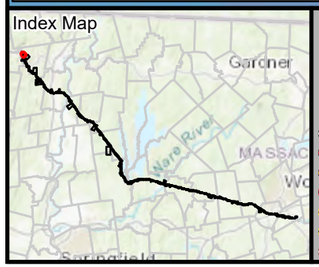

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Environmental Resources Map

Shelburne, MA
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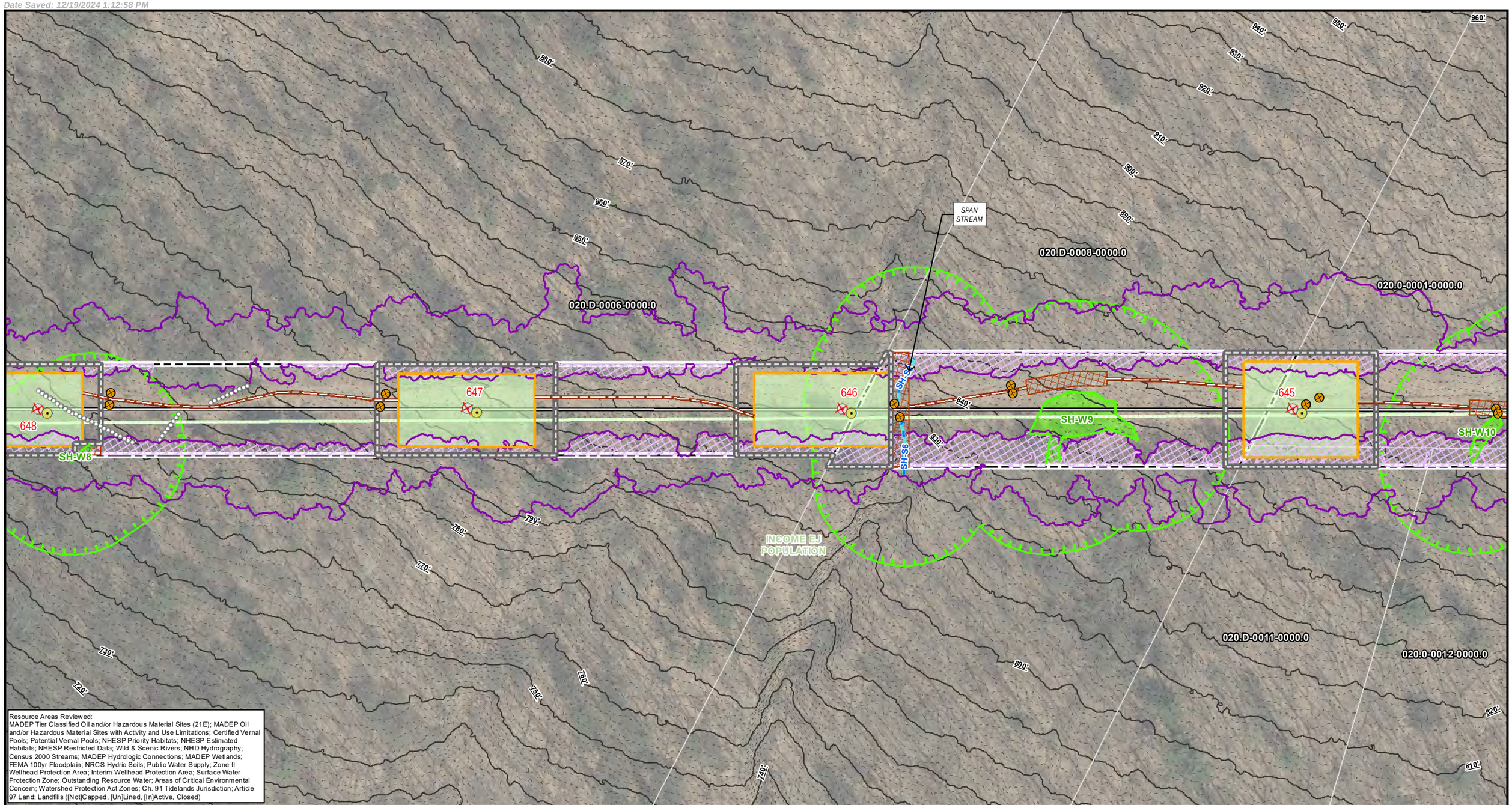

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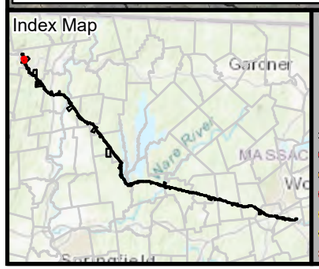

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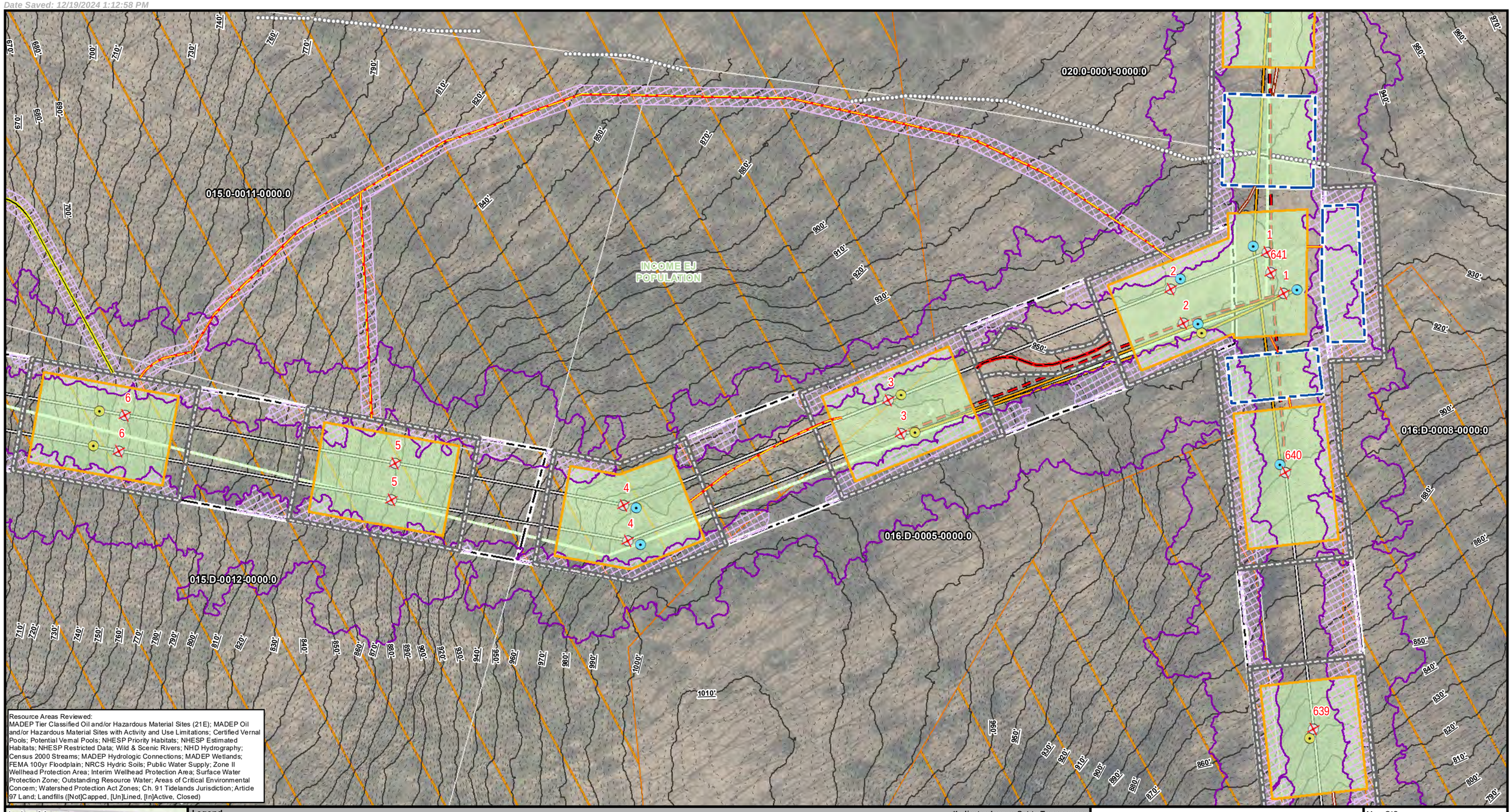

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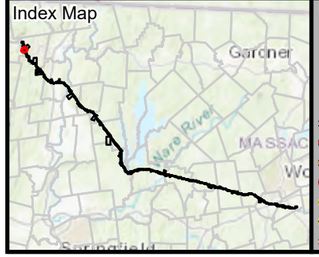
Index Map



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Indicates Layers Set to Transparency

- Town Boundary
- Parcel Boundaries

Environmental Justice Populations 2020

- Income

N

1 inch = 100 feet

0 50 100

Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Shelburne, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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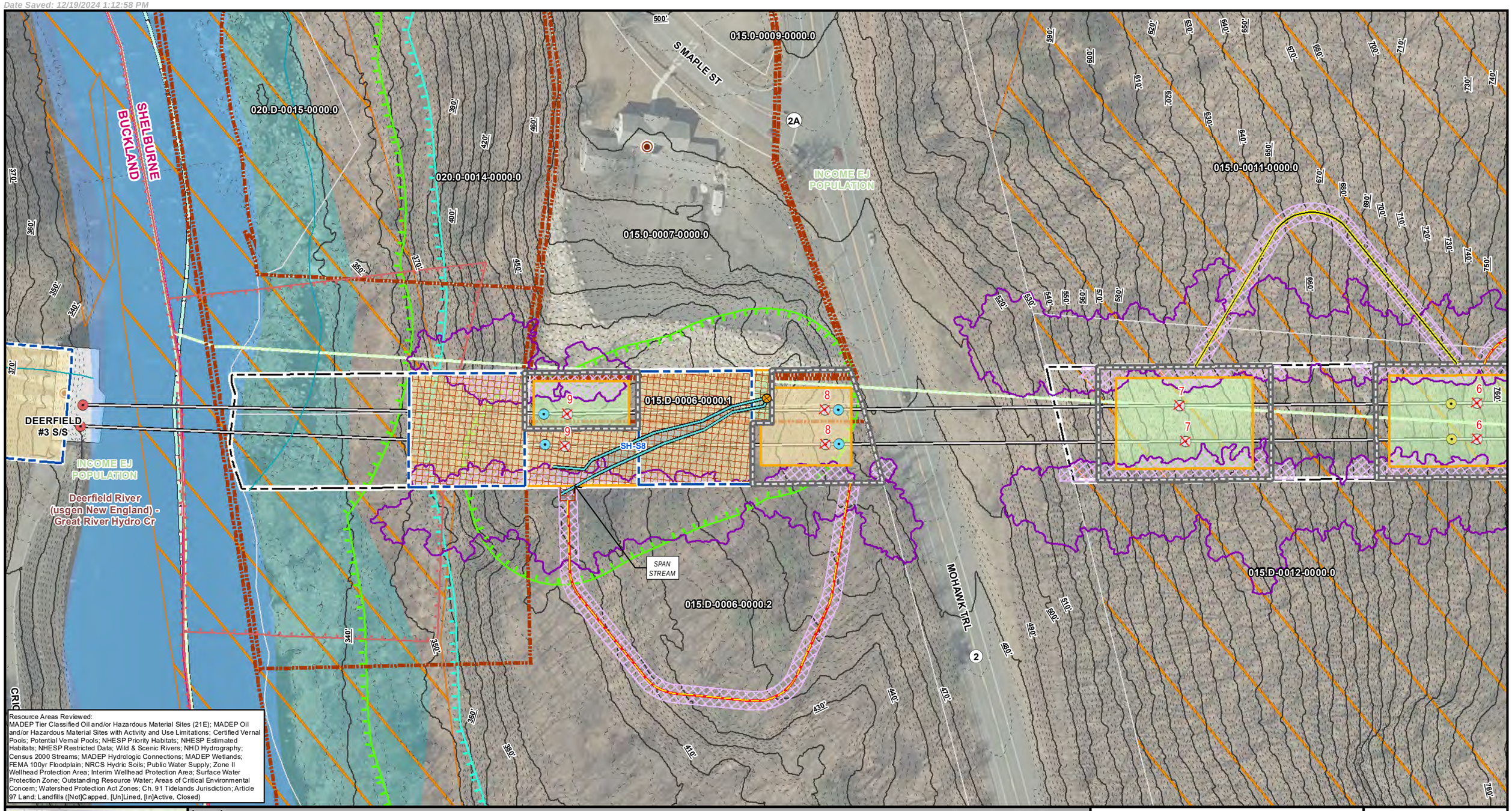

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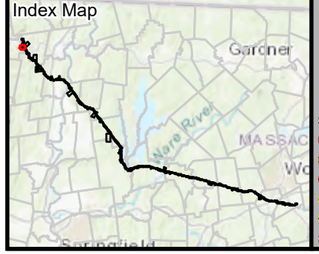

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Environmental Resources Map

Shelburne, MA

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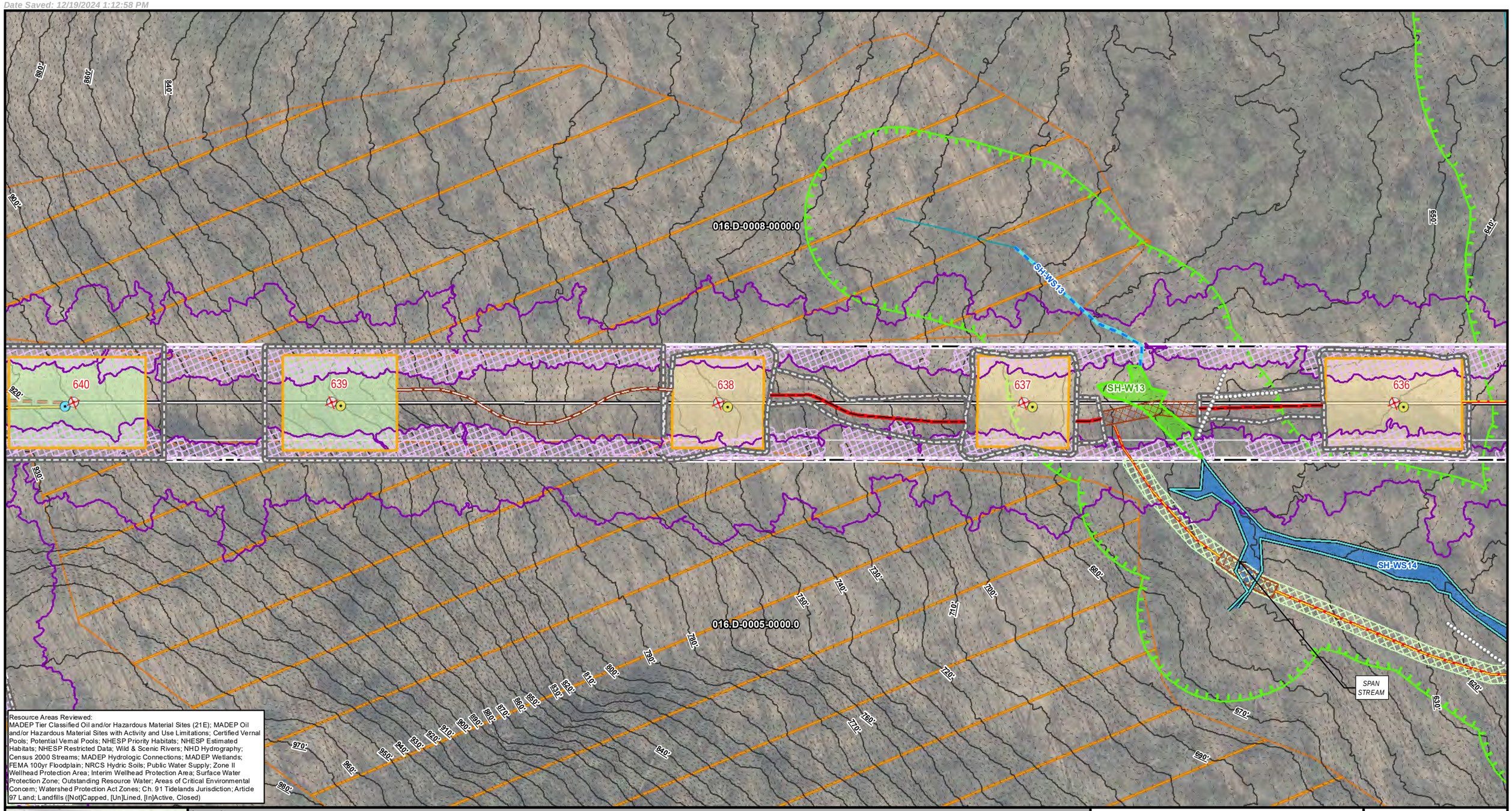

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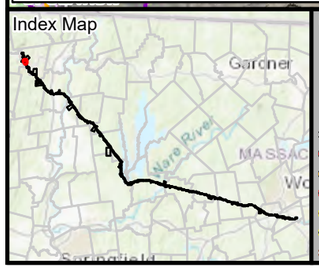

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Environmental Justice Populations 2020

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Shelburne, MA

MassGIS
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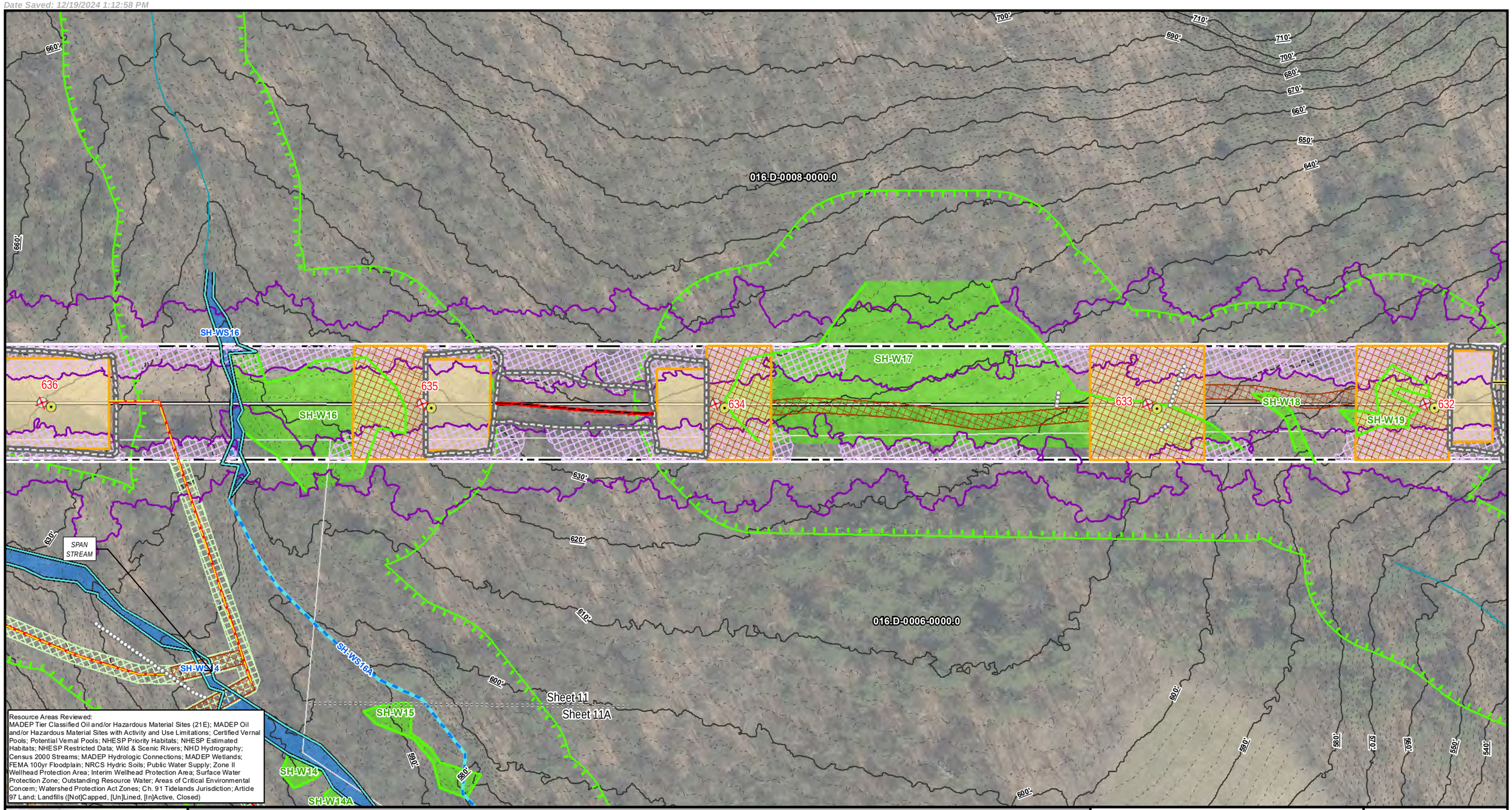

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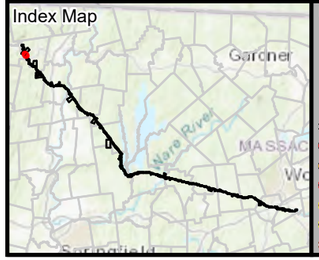

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SH-W16
016.D-0008-0000.0
SH-WS16
Sheet 11
Sheet 11A
016.D-0006-0000.0
Shelburne State Forest
SH-W15
SH-WS14
SH-W14
SH-W14A
SH-WS16A
SPAN STREAM
SPAN STREAM
ROUTE 2 MOHAWK TRAIL
MOHAWK TRL
016.D-0005-0000.0
016.D-0004-0000.2
540'
530'
480'
470'
550'
610'
620'
630'
640'
650'
660'
670'
680'
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Index Map
Gardner
Springfield

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Article 97 Lands

- DCR-State Parks & Recreation

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Shelburne, MA
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MassGIS
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Sheet 12A
Sheet 12

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016.D-0007-0000.0
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011.D-0010-0000.0
011.D-0006-0000.1
011.D-0006-0000.3
011.D-0005-0000.2

SPAN STREAM
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SH-WS20A
SH-WS20A
SH-WS20A
SH-WS20
SH-WS20B

SH-W19
SH-W20
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MOHAWK TRL
ROUTE 2:MOHAWK TRAIL
WILCOX HOLLOW ROAD

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Sheet 12

Sheet 12A
Sheet 13

SH-WS20

SPAN STREAM

SPAN STREAM

SH-S9

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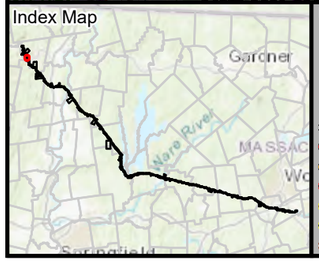

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1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Shelburne, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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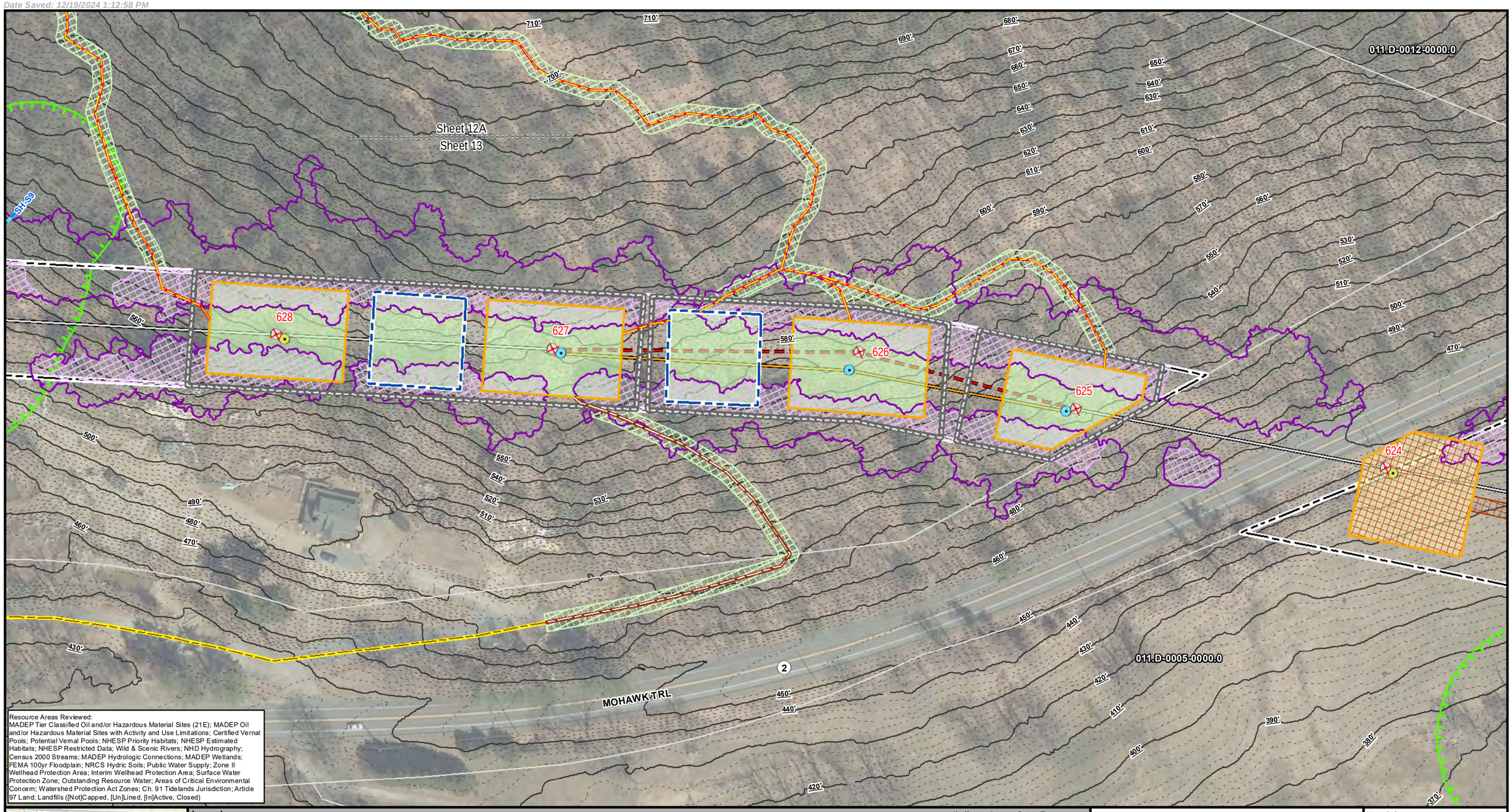

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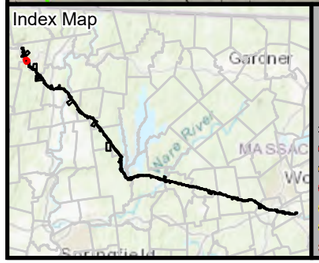
Index Map



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Sheet 14A
Sheet 14
011.D-0004-0000.0
011.D-0004-0000.1
MOHAWK TRL
2
SH-WS24
SH-WS24A
011.D-0005-0000.0
623
622
621
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SH-W23
SH-W22
SH-W24
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MAHICAN-MOHAWK TRAIL
Deerfield River
(usgen New England) -
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Springfield

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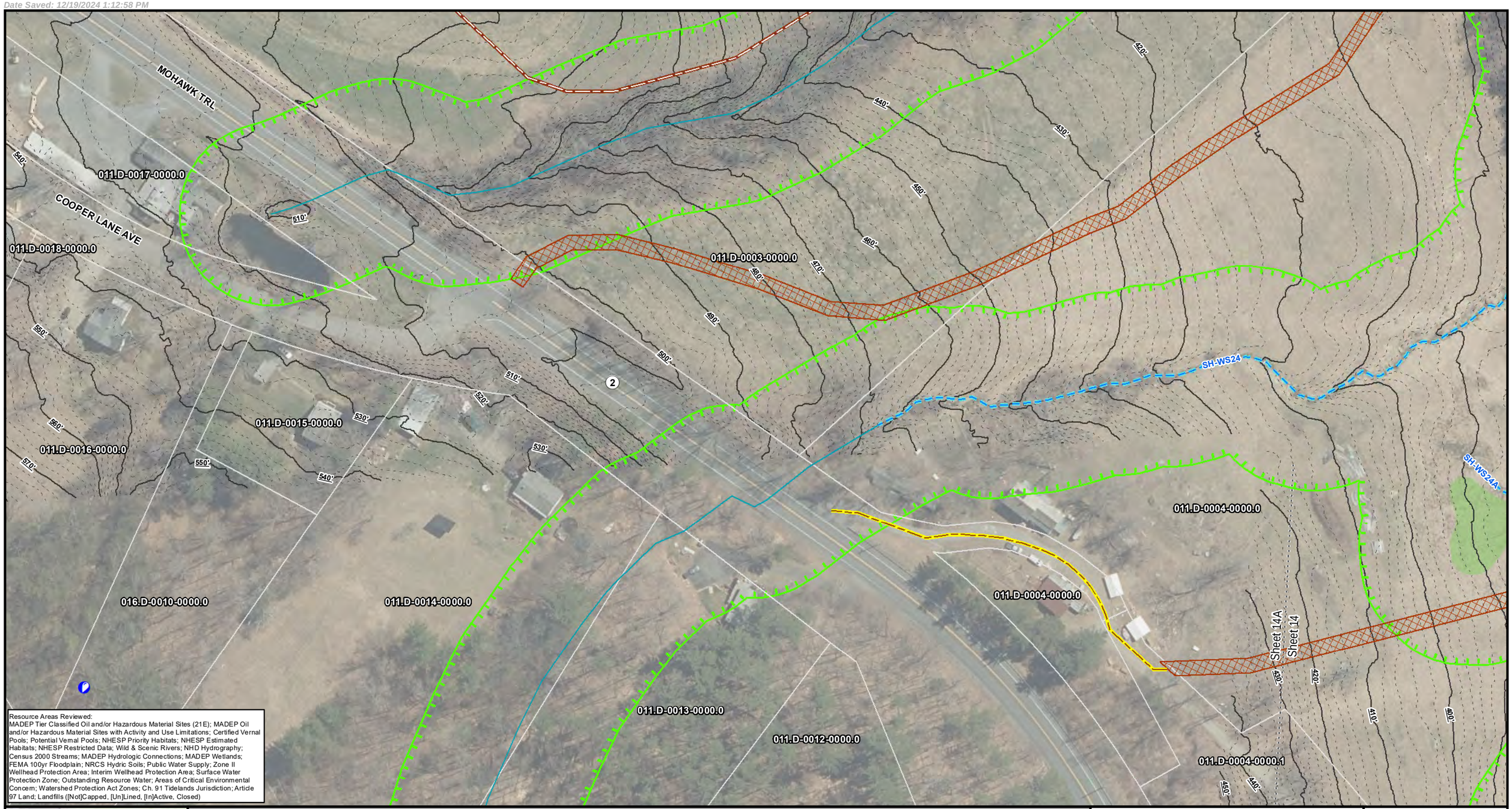

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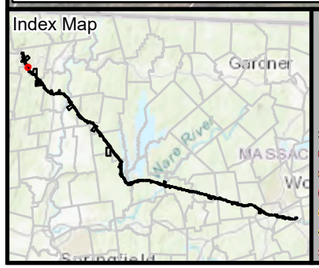

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Sheet 15A
Sheet 15

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SPAN STREAM

620
SH-W24
619
618
617
616

MAHICAN MOHAWK TRAIL

Deerfield River (usgen New England) - Great River Hydro Cr

410'
420'
400'
390'
380'
370'
360'
350'
340'
330'
320'
310'
300'
290'

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*Indicates Layers Set to Transparency

- Town Boundary
- Parcel Boundaries

Article 97 Lands

- Private

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0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Shelburne, MA

MassGIS
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MOHAWK TRL
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380'
390'
400'
410'
420'
430'
440'
450'
460'
470'
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490'
500'
510'
520'
530'
540'
550'
560'
570'
580'
590'
2

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Sluice Brook
MAHICAN-MOHAWK TRAIL
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Sheet 16
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068/401.0-0006-0006.0
068/401.0-0006-0000.0
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SHELBURNE
CONWAY
PATRIOT CORRIDOR
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COOPER LANE AVE
MOHAWK TRL
011.D-0021-0000.0
011.D-0001-0000.0
011.D-0002-0000.0
011.D-0003-0000.0
Sluice Brook
Sheet 16
Sheet 16A
2
460'
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440'
430'
420'
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540'
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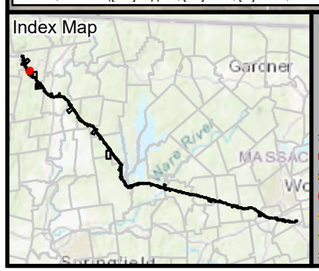

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1 inch = 100 feet
0 50 100
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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Shelburne, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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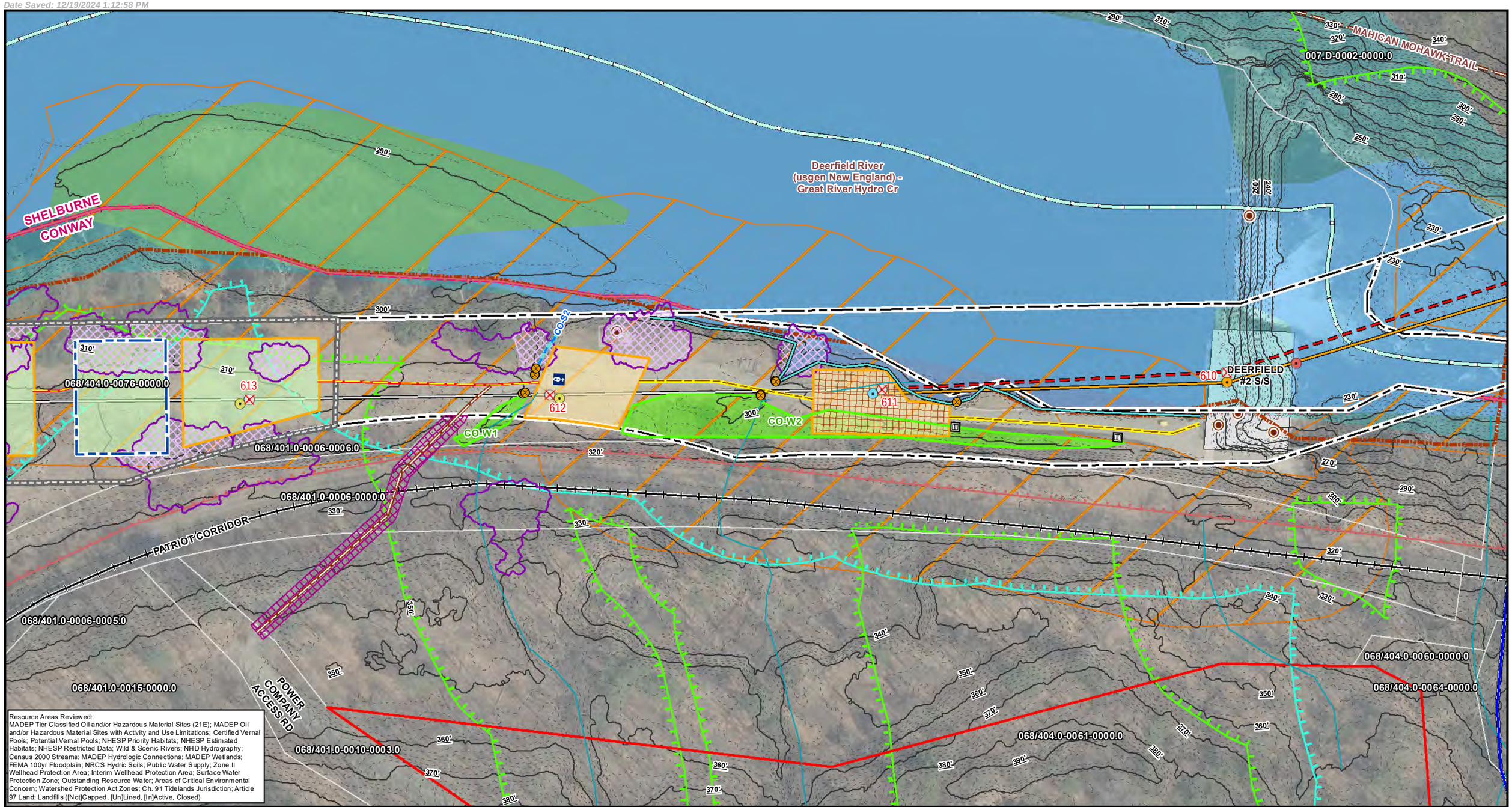

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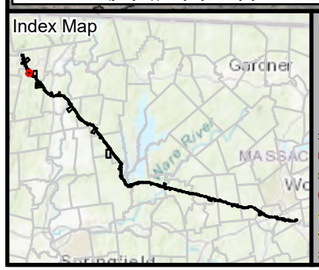

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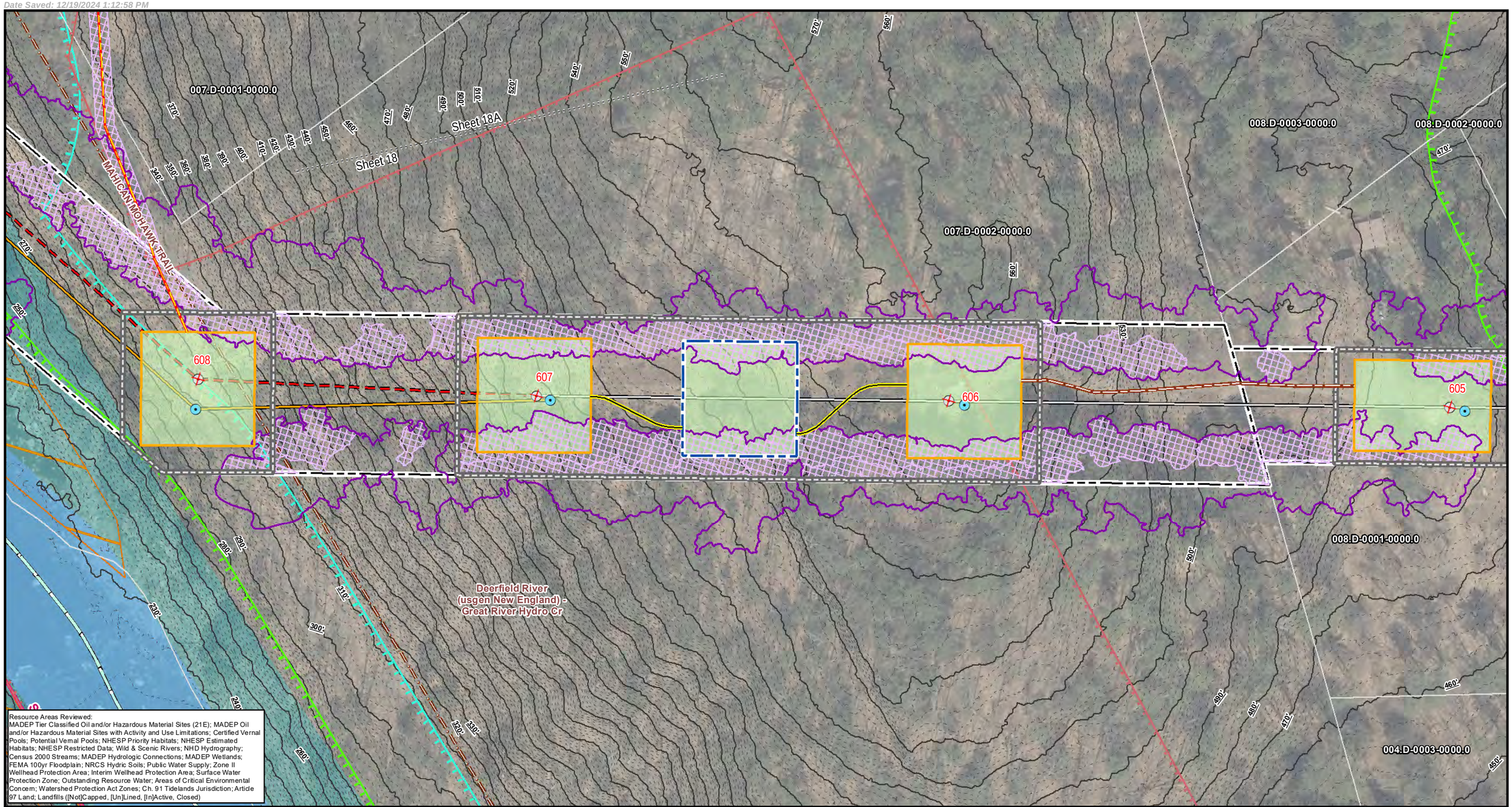

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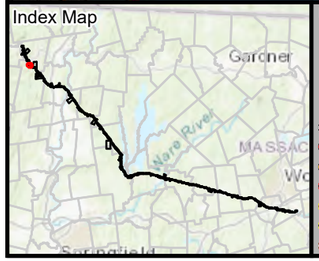

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Sheet 18A
Sheet 18A
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SPAN STREAM
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SH-S10
SH-S10A
SH-S11
CO-S2
CO-W1
CO-W2
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Deerfield River (usgen New England) - Great River Hydro Cr
MAHICAN MOHAWK TRAIL
SHELBURNE
CONWAY
Schneck Brook
Sluice Brook
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Index Map
Gardner
Springfield
MASSAC

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Environmental Resources Map

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Sheet 18A
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SH-W25
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Sluice Brook
SH-W26
SH-S10
SH-S10A
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2
MOHAWK TRL
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011.D-0022-0000.0
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MAHICAN MOHAWK TRAIL
Deerfield River (usgen New England) - Great River Hydro Cr
410'
400'
380'
310'

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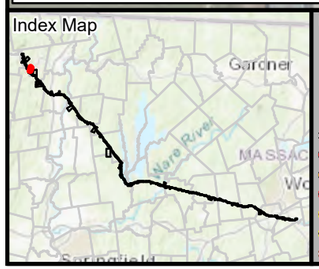

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Environmental Resources Map

Shelburne & Conway, MA
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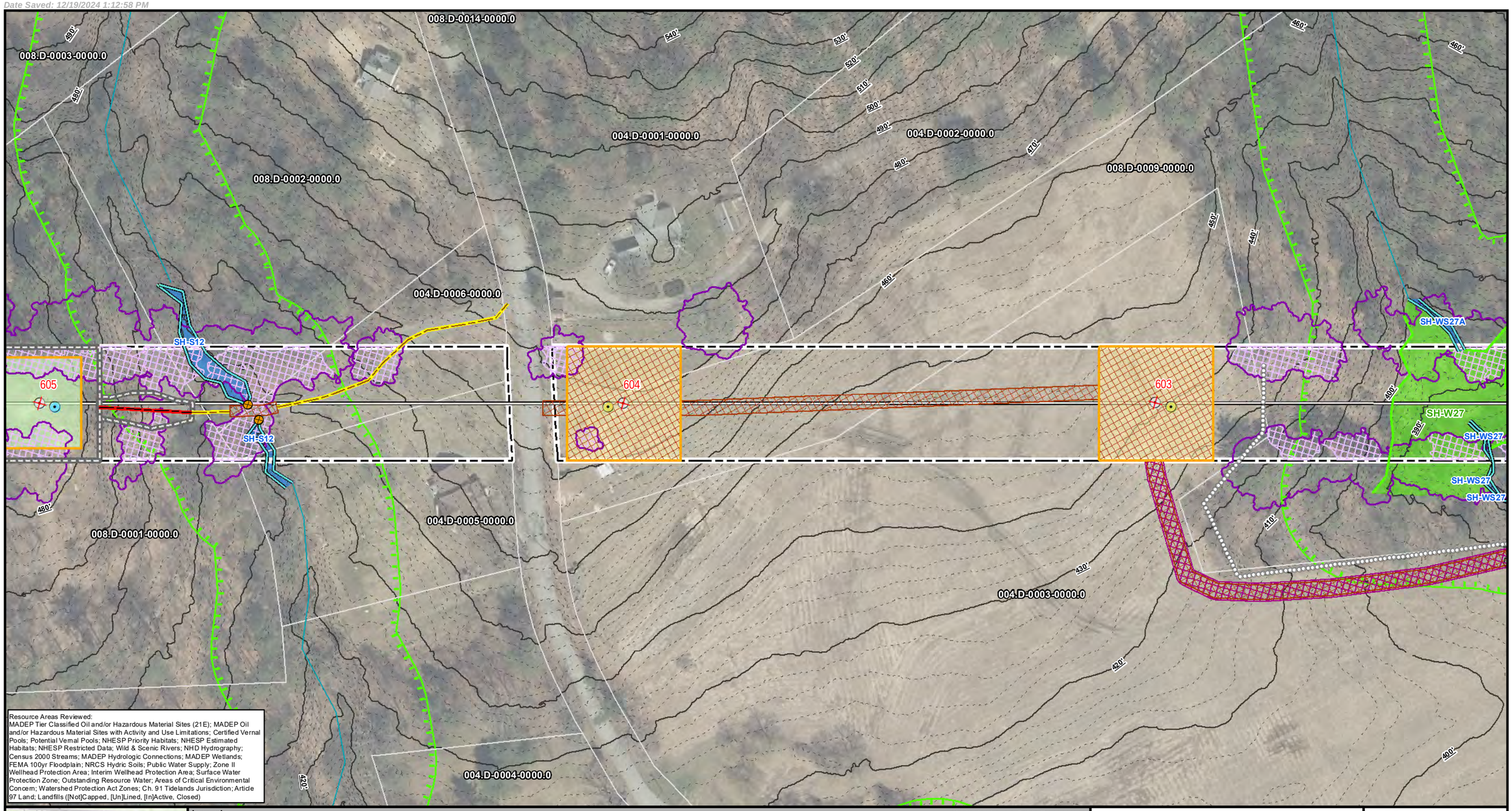

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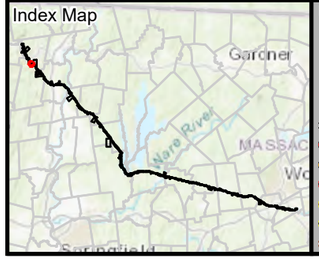

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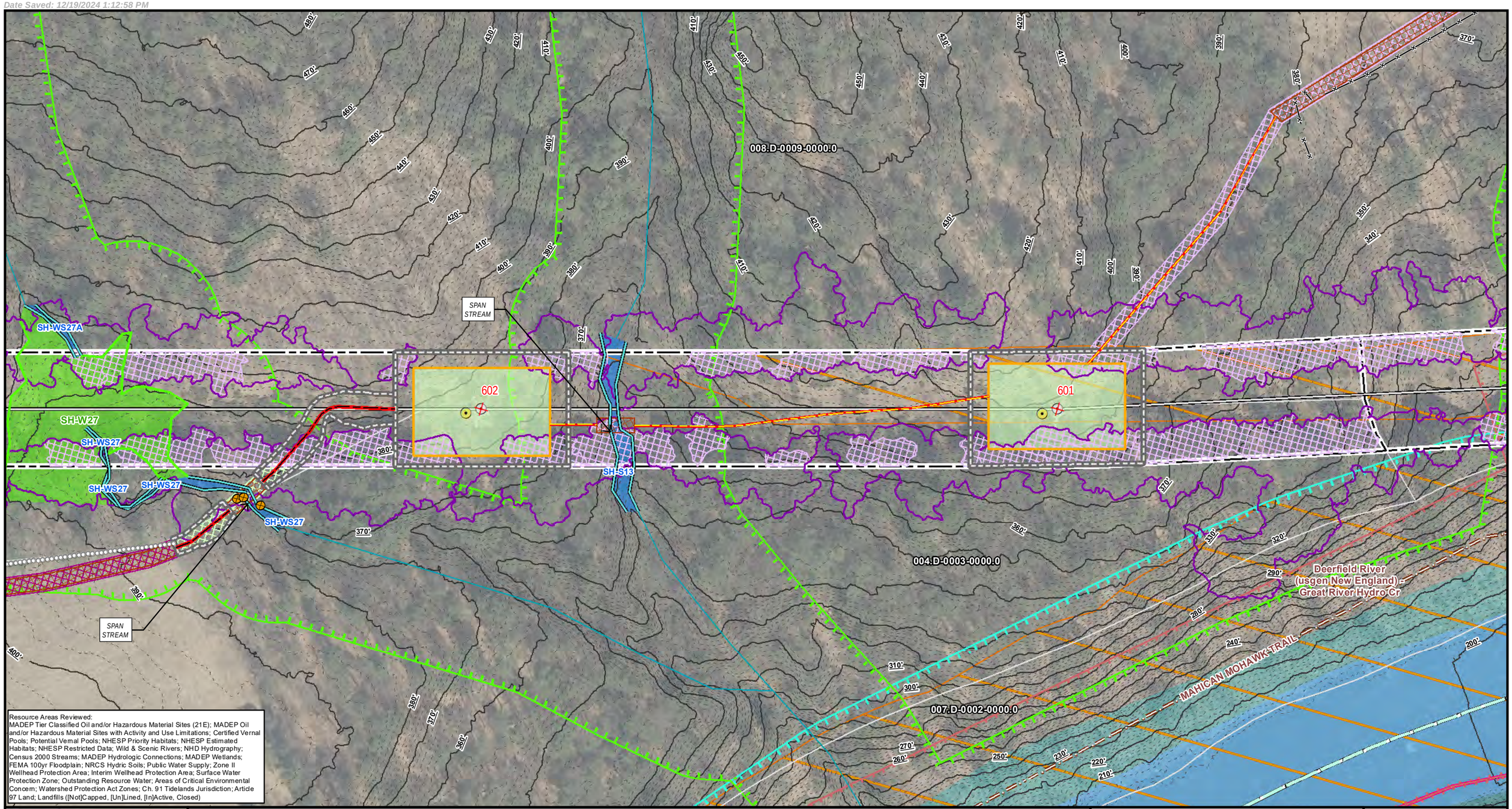

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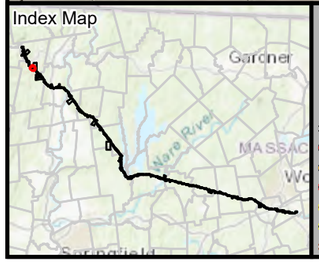

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Sheet 21

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008.D-0007-0000.0
008.D-0009-0000.0
004.D-0003-0000.0
007.D-0002-0000.0

SPAN STREAM
SPAN STREAM

600
599
598

MAHICAN-MOHAWK TRAIL

Deerfield River
(usgen New England) -
Great River Hydro Cr

SHELBURNE
CONWAY

Resource Areas Reviewed:
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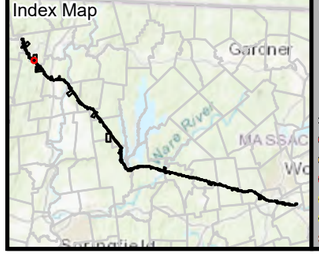

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Shelburne, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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ORCHARD RD

SH-W28 SH-W29 SH-S15 SH-W31 SH-W32 SH-W33 SH-W34 SH-W36 SH-W30 SH-WS30 SH-W37 SH-S14

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008.D-0007-0000.0 008.D-0009-0000.0 008.D-0013-0000.0 004.D-0003-0000.0 007.D-0002-0000.0

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Springfield

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Environmental Resources Map

Shelburne, MA
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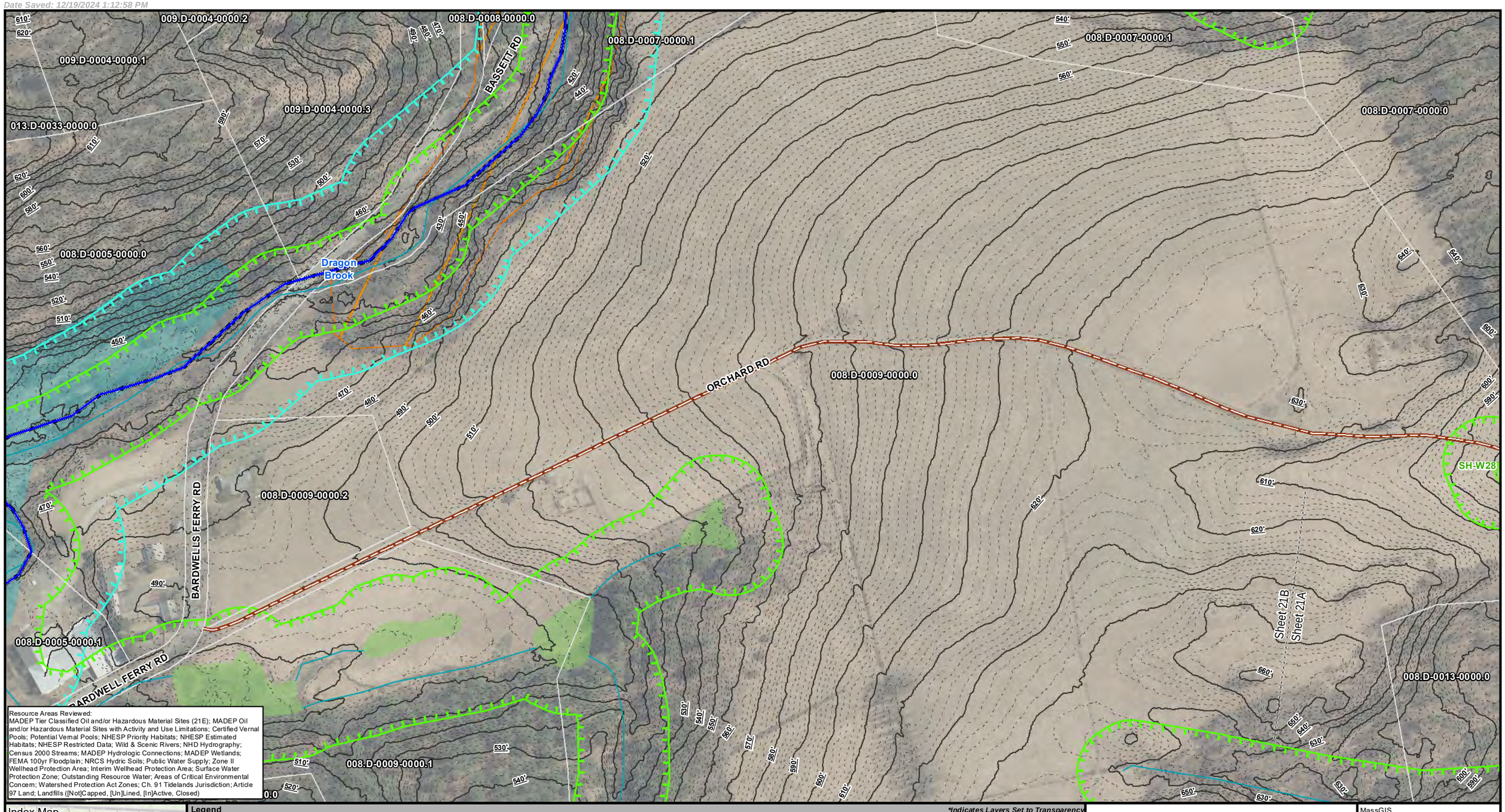

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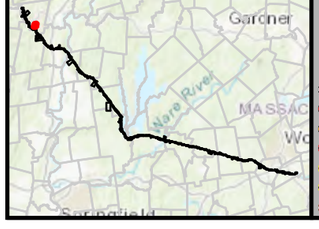

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Shelburne, MA
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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Shelburne & Conway, MA

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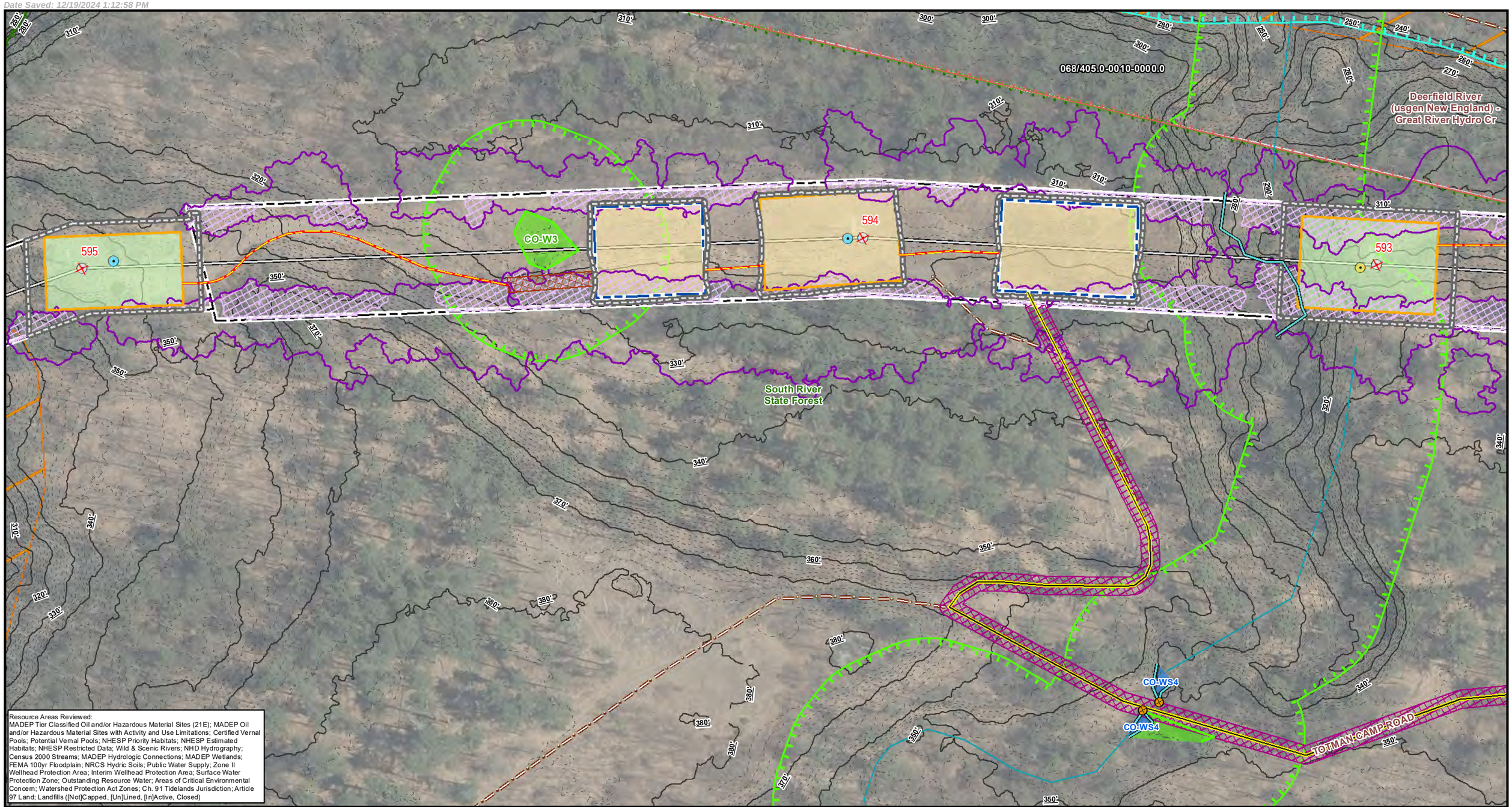

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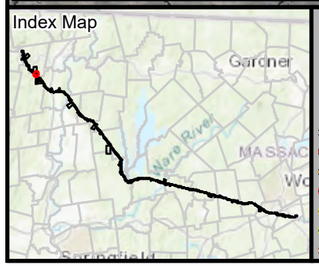

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Conway, MA

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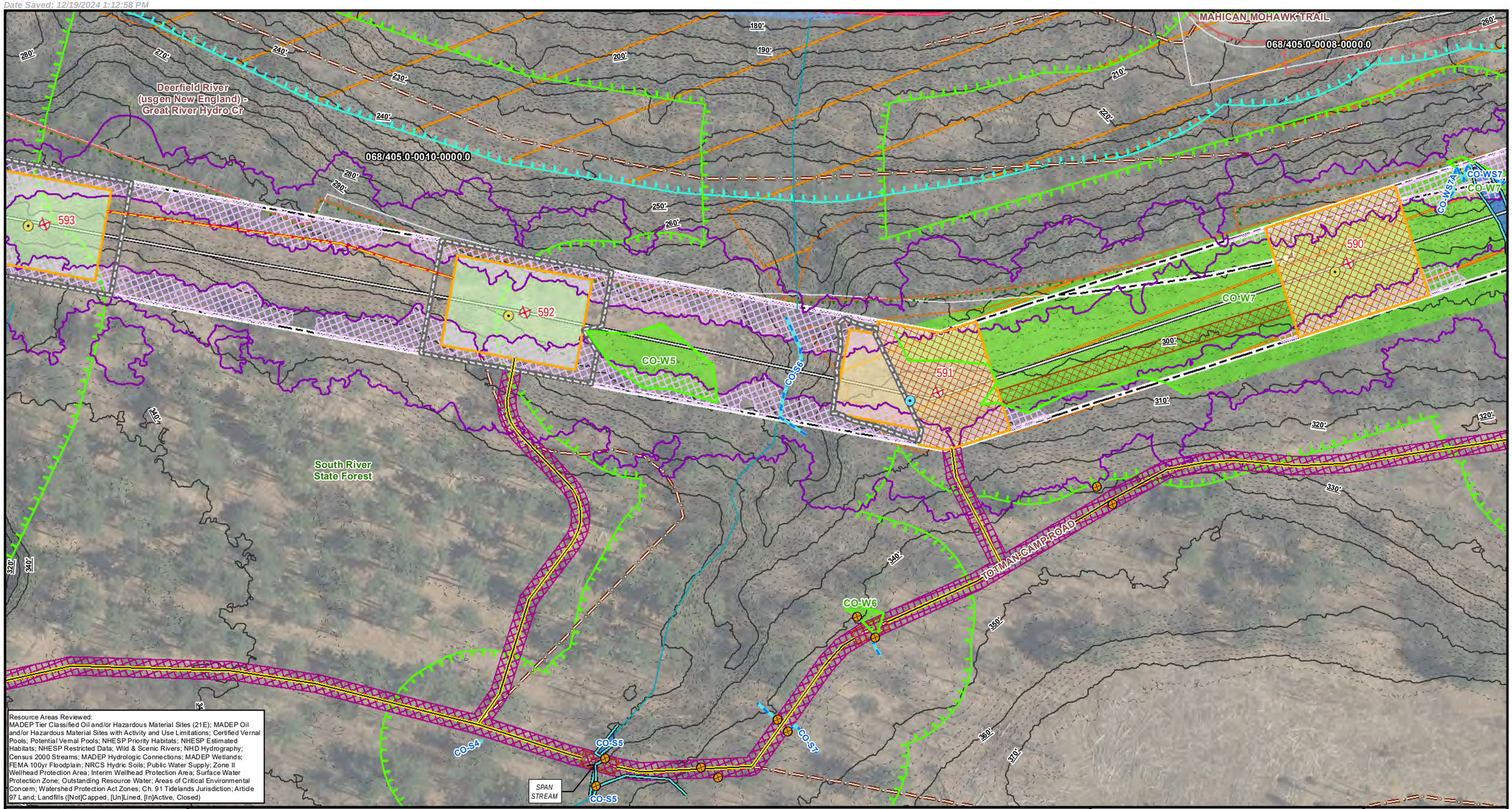

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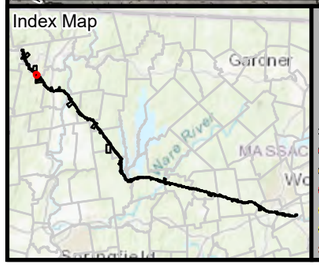

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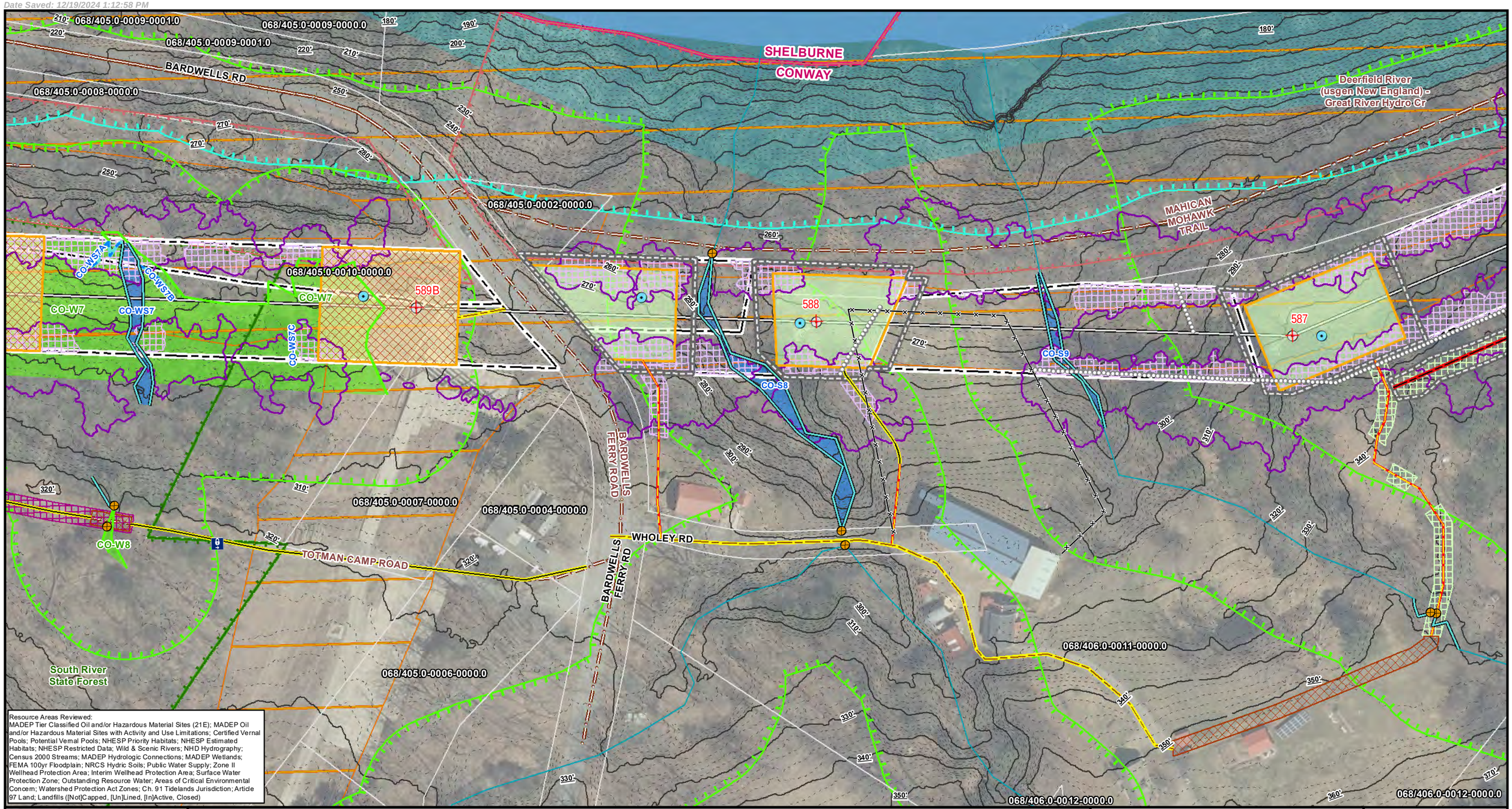

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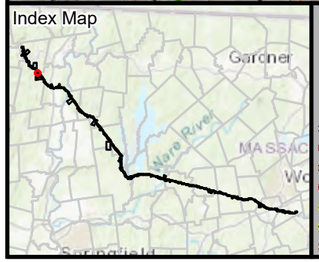

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Environmental Resources Map

Conway, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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DEERFIELD
CONWAY

Deerfield River (usgen New England) - Great River Hydro Cr

MAHICAN MOHAWK TRAIL

Totman Farm Apr

586
585
584
CO-W9
CO-S10
CO-S10
CO-S11

068/406.0-0011-0000.0
068/406.0-0013-0000.0
068/406.0-0012-0000.0

Resource Areas Reviewed:
MADEP Tier Classified Oil and/or Hazardous Material Sites (21E); MADEP Oil and/or Hazardous Material Sites with Activity and Use Limitations; Certified Vernal Pools; Potential Vernal Pools; NHESP Priority Habitats; NHESP Estimated Habitats; NHESP Restricted Data; Wild & Scenic Rivers; NHD Hydrography; Census 2000 Streams; MADEP Hydrologic Connections; MADEP Wetlands; FEMA 100yr Floodplain; NRCS Hydric Soils; Public Water Supply; Zone II Wellhead Protection Area; Interim Wellhead Protection Area; Surface Water Protection Zone; Outstanding Resource Water; Areas of Critical Environmental Concern; Watershed Protection Act Zones; Ch. 91 Tidelands Jurisdiction; Article 97 Land; Landfills ([Not]Capped, [Un]Lined, [In]Active, Closed)

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Gardner
Springfield

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- Parcel Boundaries

Article 97 Lands

- Private

*Indicates Layers Set to Transparency

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

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Conway, MA

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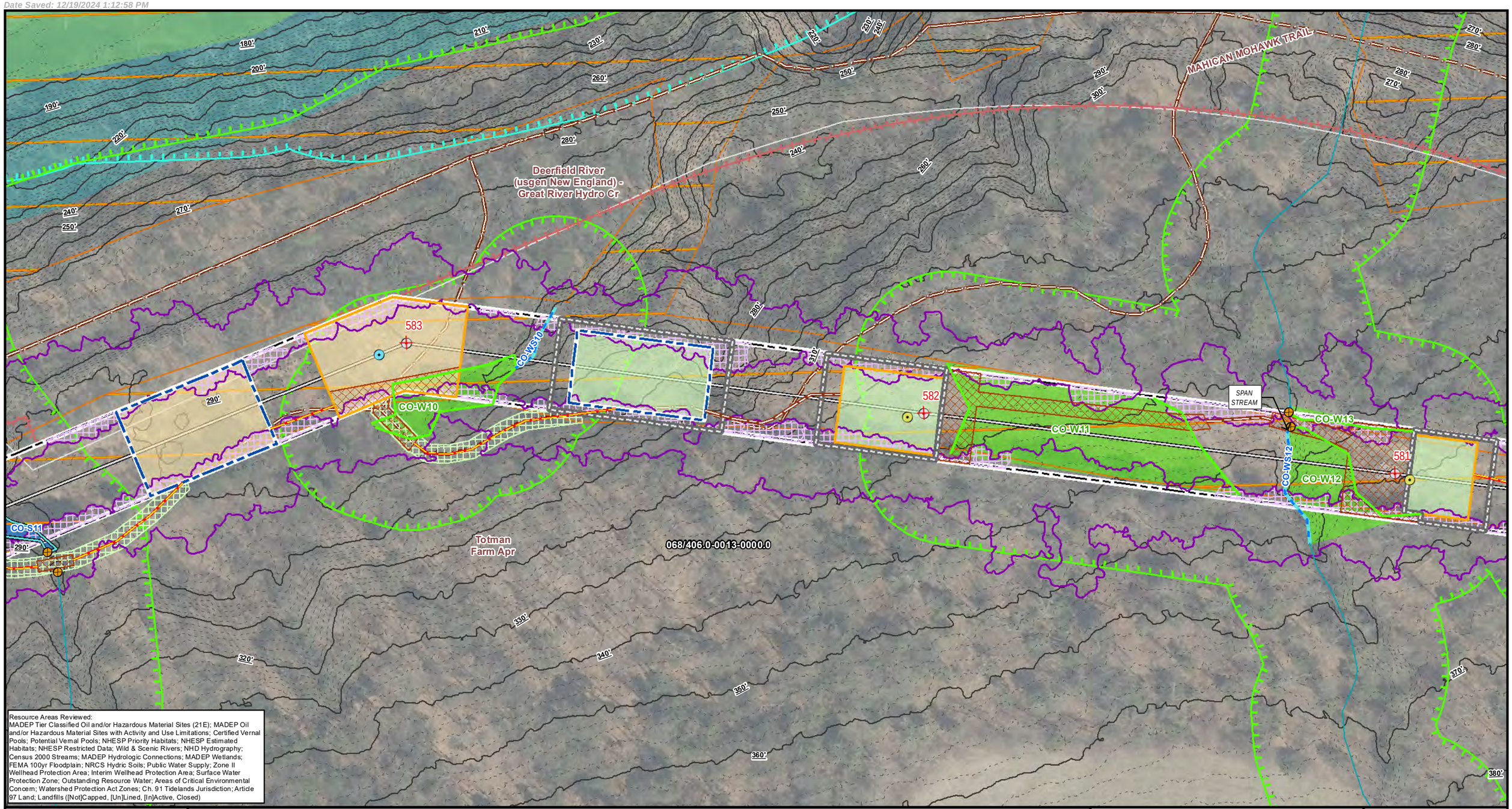

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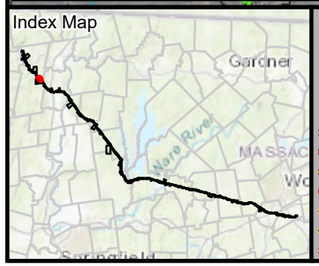

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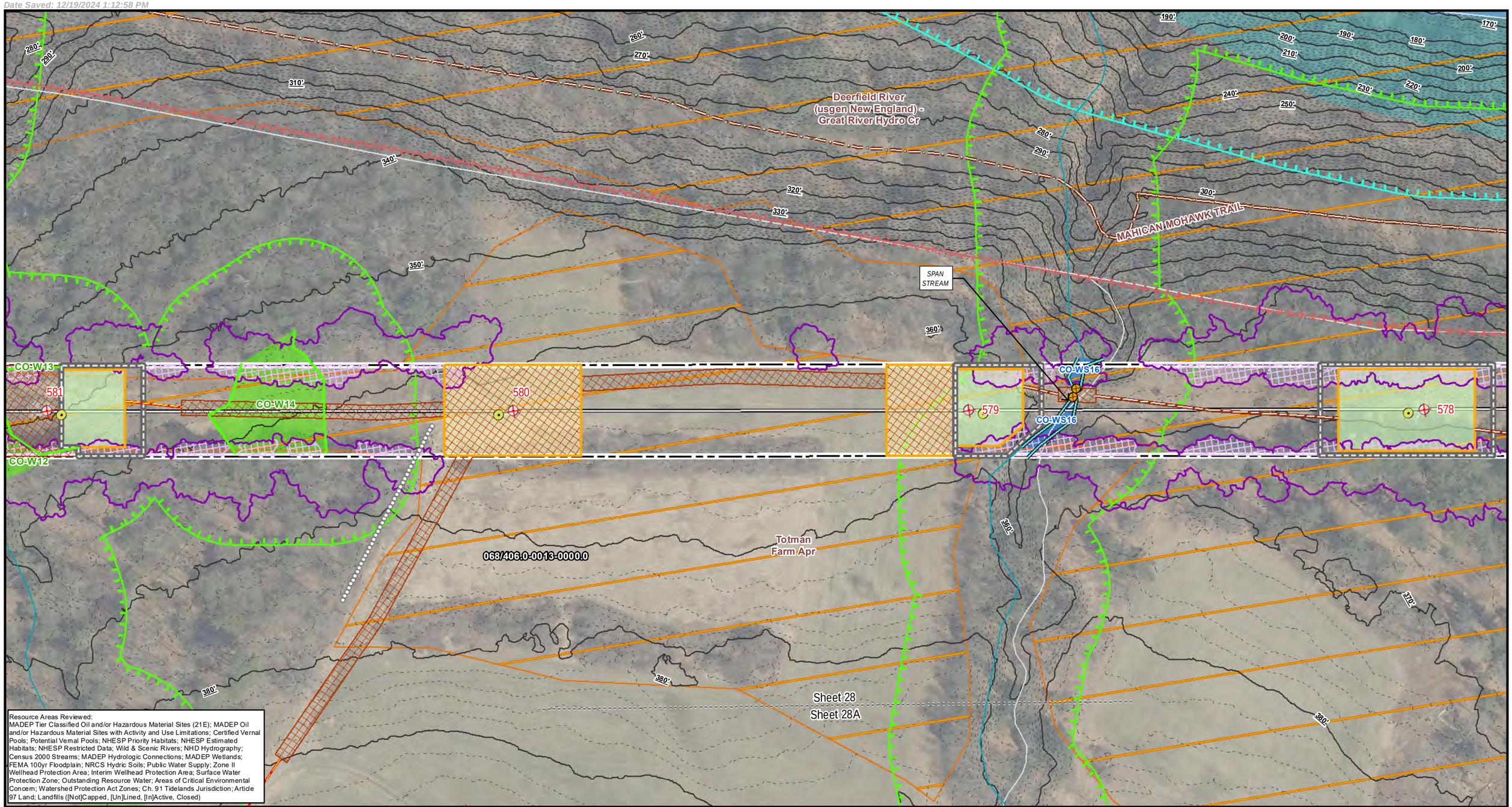

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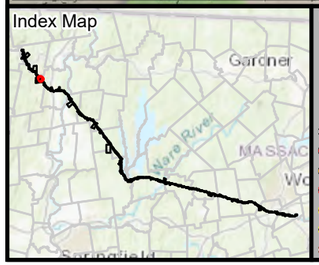

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Article 97 Lands

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

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068/406.0-0019-0000.0
BARDWELLS FERRY RD
MAHICAN MOHAWK TRAIL
SPAN STREAM
SPAN STREAM
CO-W11
CO-W12
CO-W13
CO-W14
CO-W15
CO-W16
CO-WS16
CO-WS16
CO-WS16
582
581
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Totman Farm Apr
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Deerfield River (usgen New England) - Great River Hydro Cr
CONWAY STATION ROAD
STATION RD
Sheet 28
Sheet 28A

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Environmental Resources Map

Conway, MA
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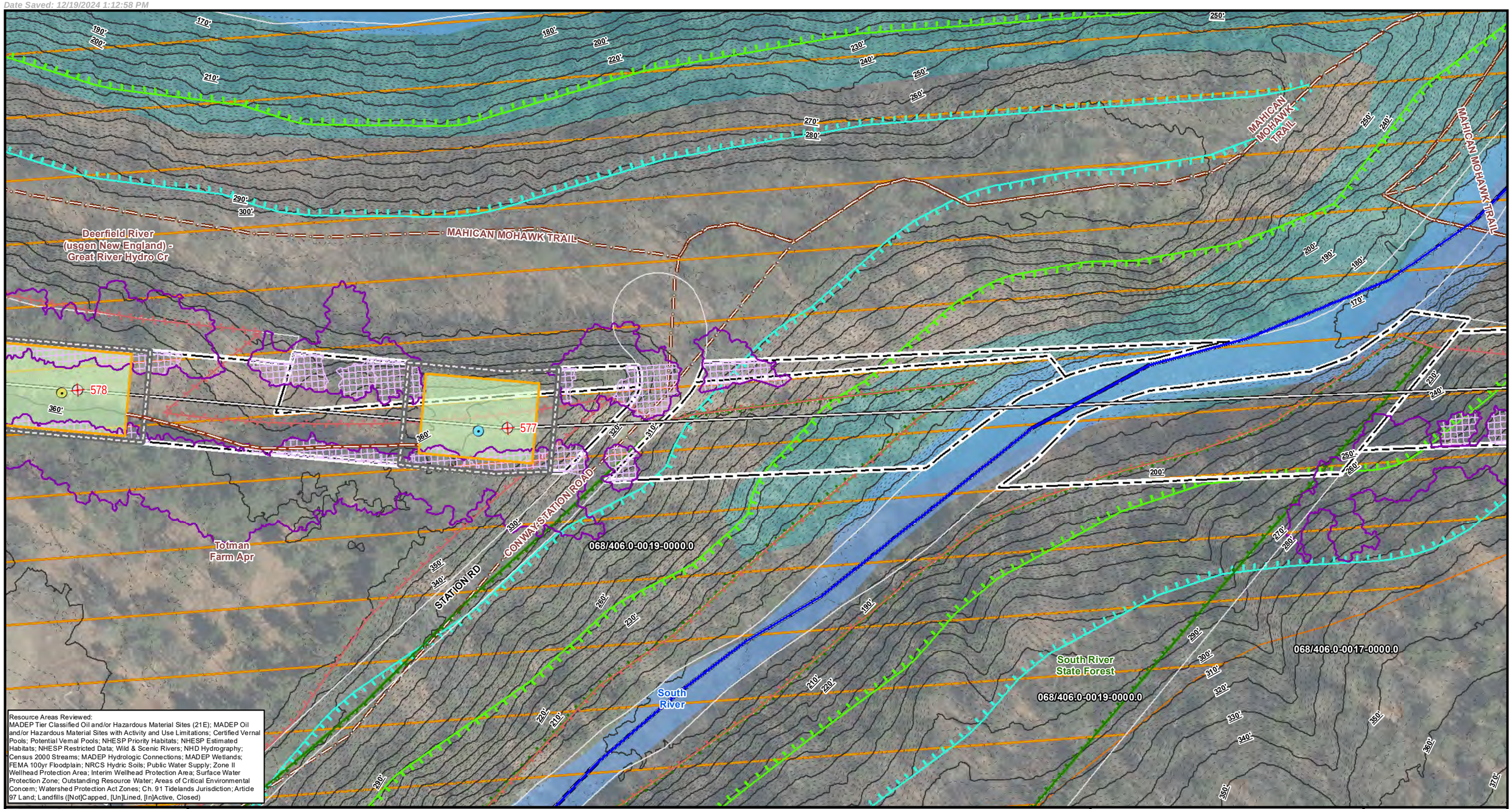

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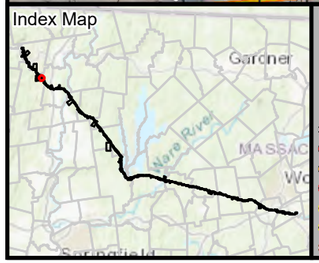

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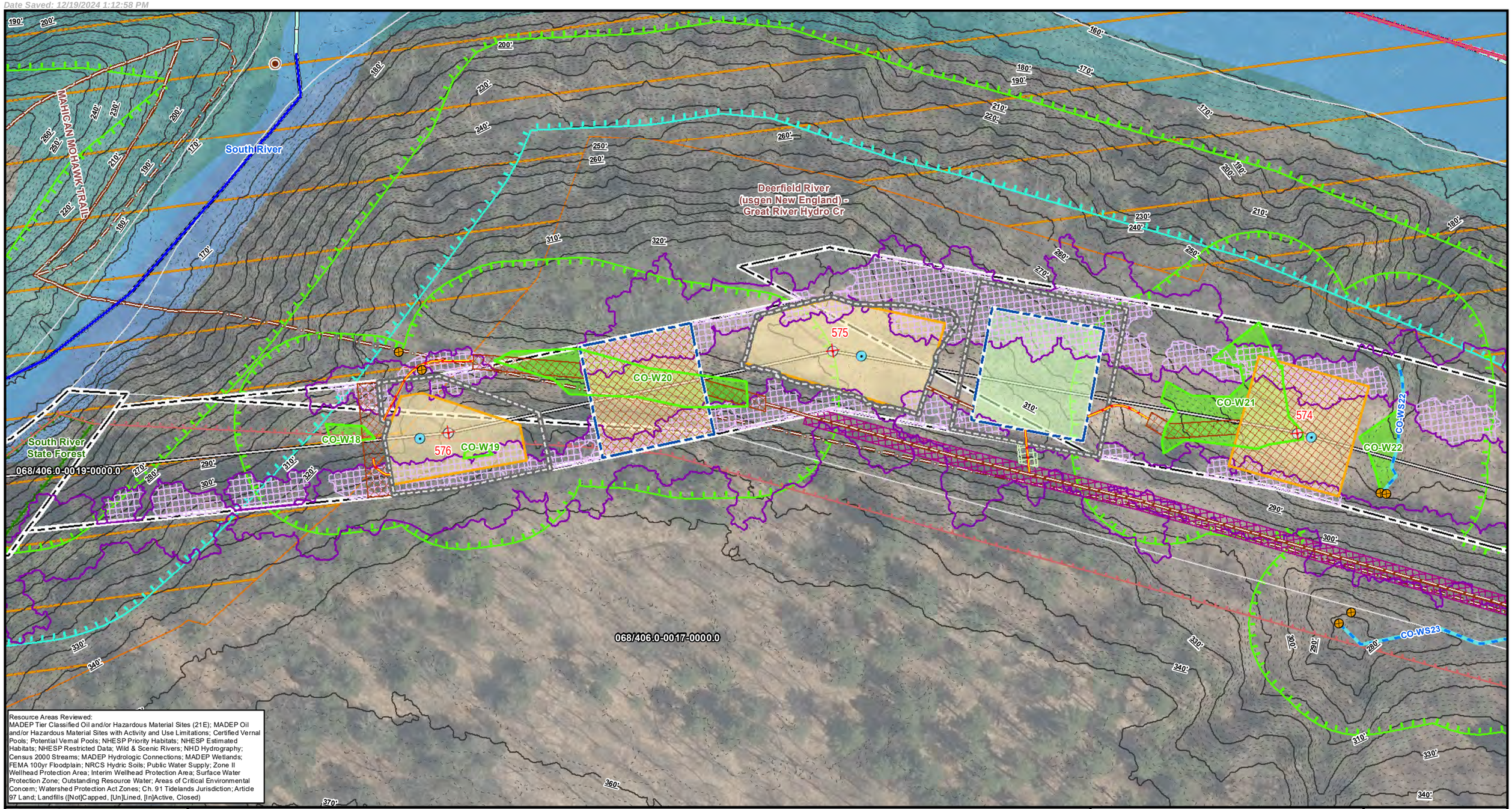

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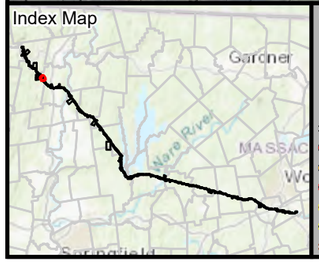

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- Fenceline
- Guardrail
- Stonewall
- Existing Treeline
- Tree Removal
- Selective Tree Removal
- Pruning

*Indicates Layers Set to Transparency

- Town Boundary
- Parcel Boundaries

Article 97 Lands
- Private

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Conway, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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DEERFIELD
CONWAY
MAHICAN MOHAWK TRAIL
CO-S14
CO-S15
CO-S15A
CO-S16
CO-S18
570
569
568
SPAN STREAM
SPAN STREAM
SPAN STREAM
Deerfield River (usgen) New England - Great River Hydro Cr
068/406.0-0017-0000.0
068/411.0-0068-0000.0
160'
170'
180'
190'
200'
210'
220'
230'
240'
250'
260'
270'
280'
290'
300'
310'
320'
330'
340'
350'
360'
370'
380'

Resource Areas Reviewed:
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Gardner
Springfield

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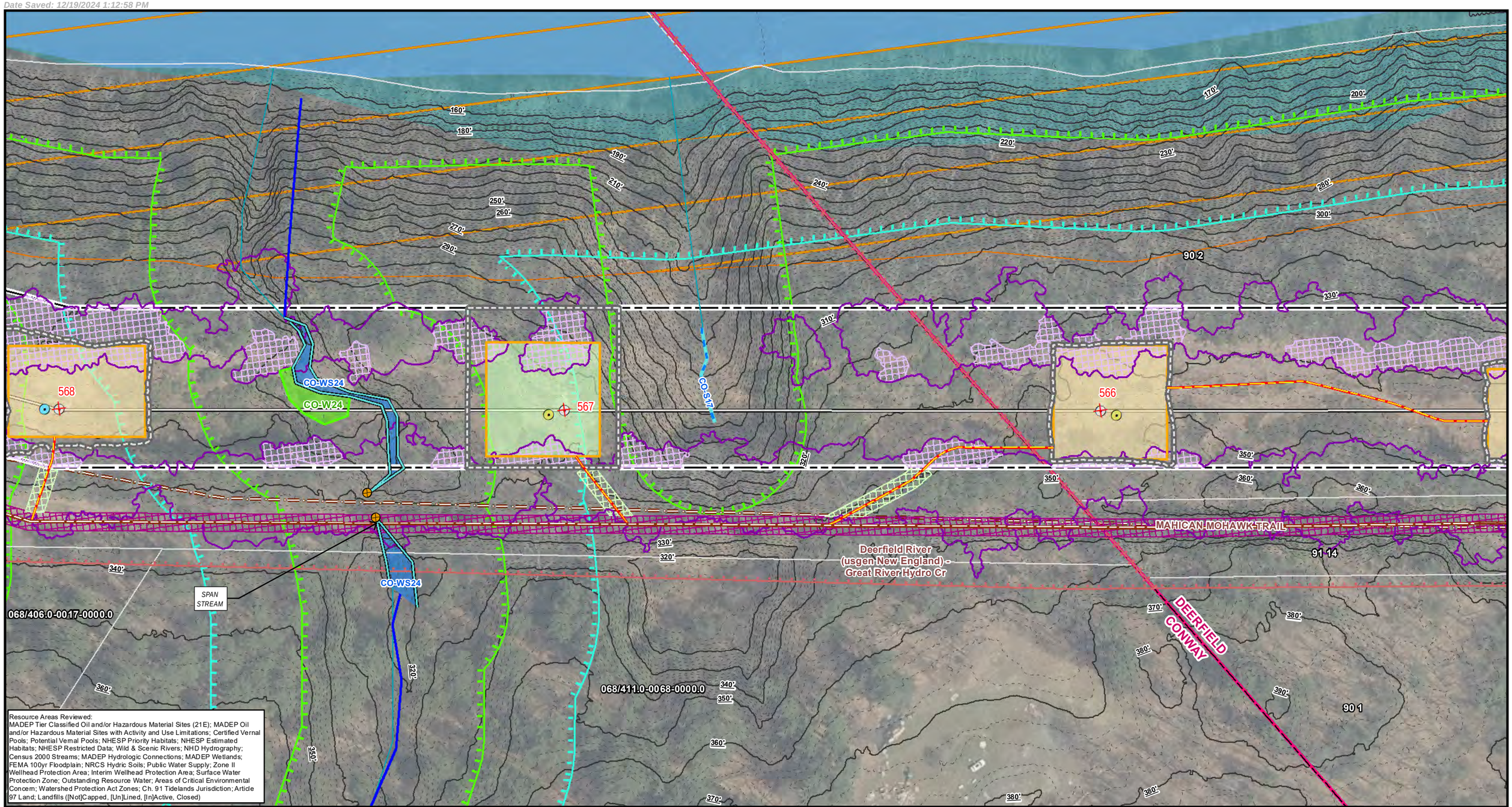

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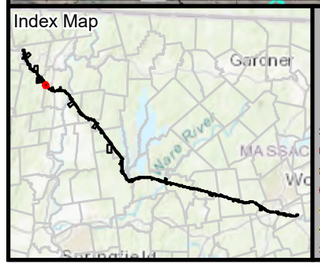

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

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Conway & Deerfield, MA

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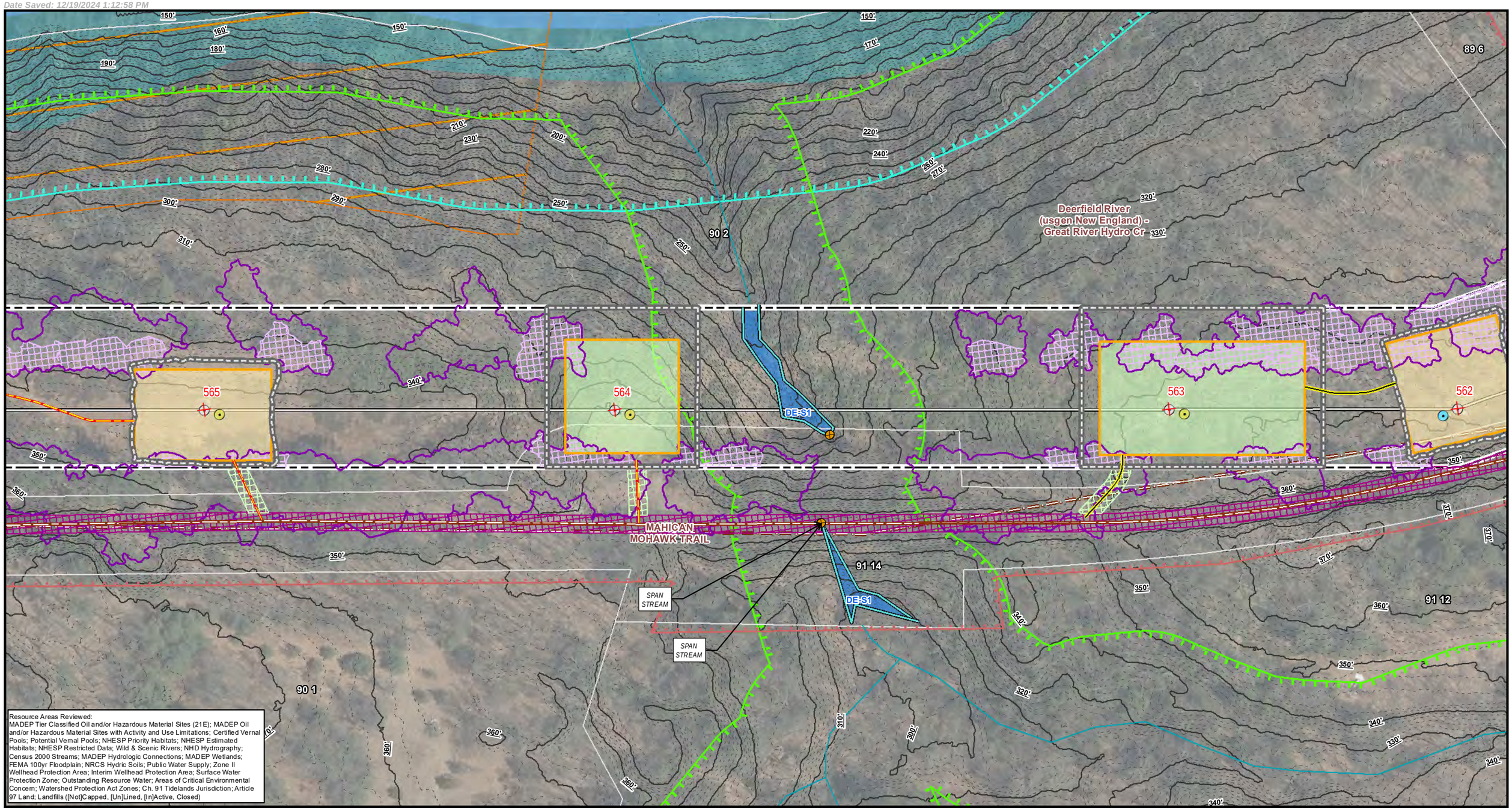

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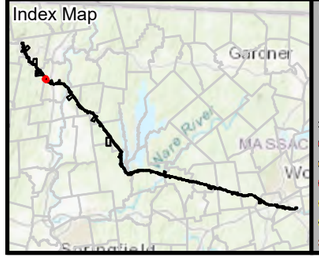

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

MassGIS
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Deerfield River (usgen New England) - Great River Hydro Cr

SPAN STREAM

DE-W1

DE-W2

562

561

560

559

MAHICAN MOHAWK TRAIL

HOOSAC RD

89 6

90 2

91 15

91 14

91 12

91 13

91 2

91 1

92 6

92 5

92 3.1

92 2.1

92 4

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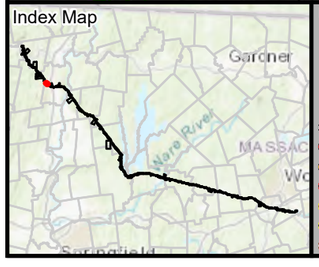

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

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92 3
92 3.1
92 13
92 14
92 2.1
92 2
92 4
91 2
92 1
106 7
106 6
106 16
92 15
106 17
106 5
Mill Village
Deerfield River (usgen New England) - Great River Hydro Cr
Bar Way Farm Inc
SANDGULLY RD
STILLWATER RD
SPAN STREAM
SPAN STREAM
DE-WS2
DE-W2
DE-W2
DE-W3
DE-WS2
558
559
557
556
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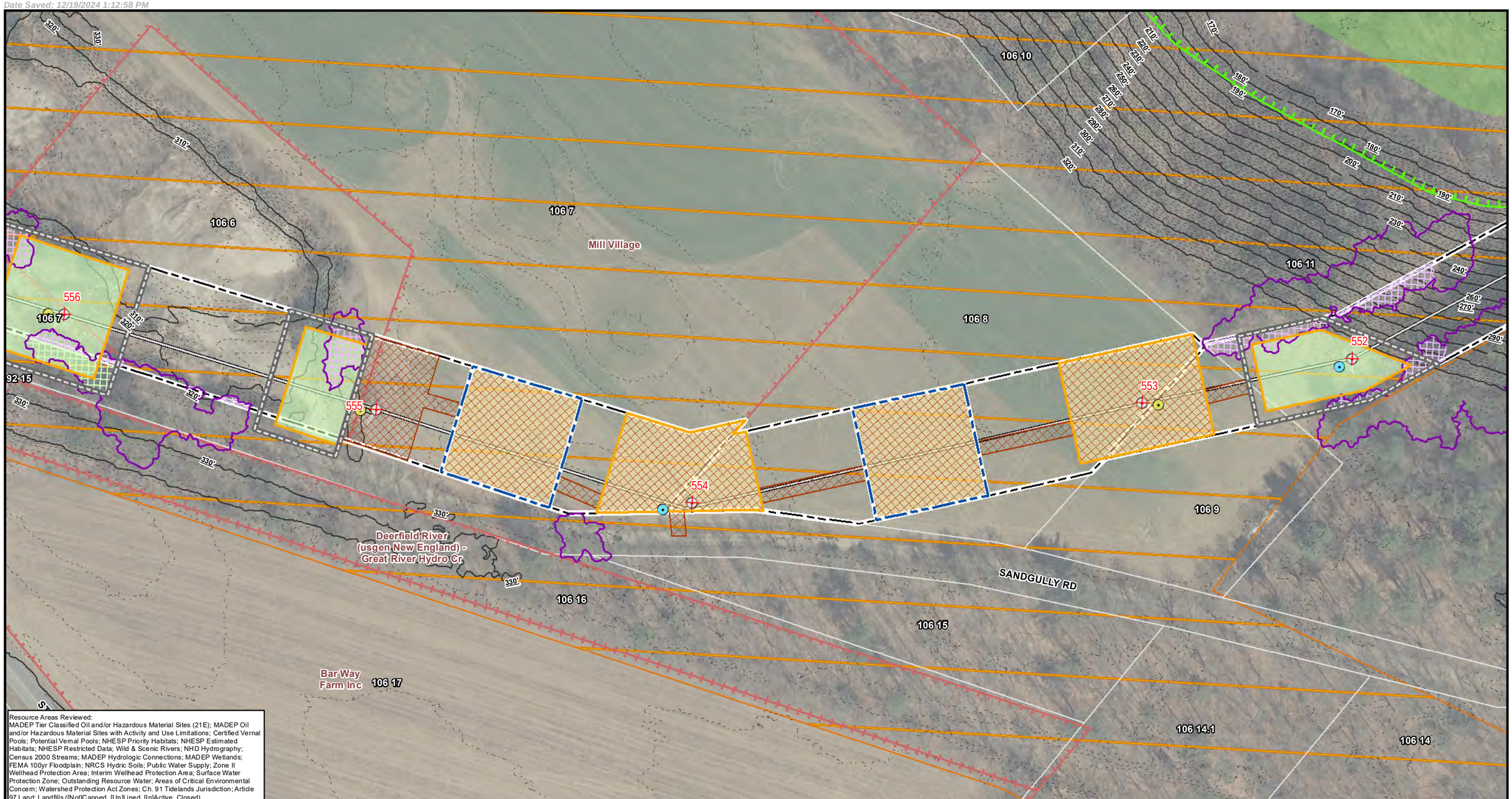

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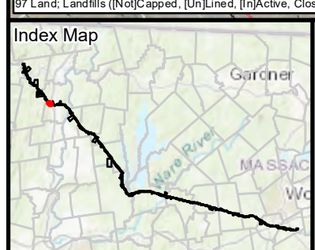

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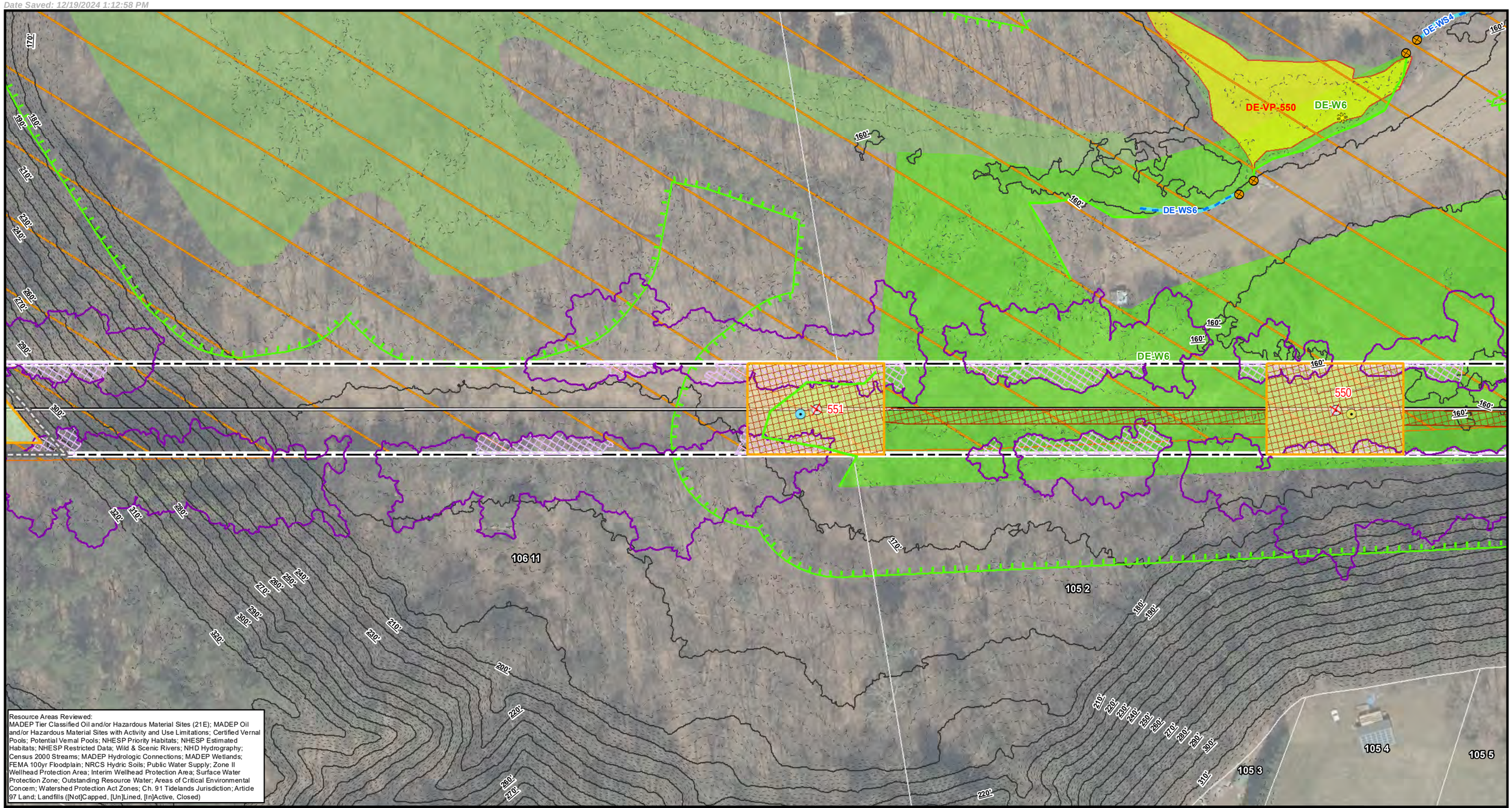

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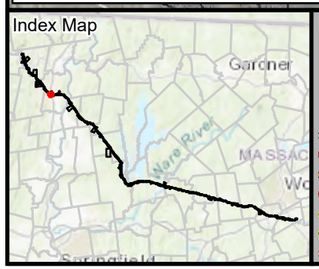

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- Estimated Wetland
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- Existing Treeline
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- Selective Tree Removal
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- Parcel Boundaries

*Indicates Layers Set to Transparency

N

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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DE-VP-550
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549
548
DE-W8
547
DE-W9
DE-W10
91
105 6
105 2
111 53
111 53
111 55
I-91
160'
170'
150'
190'
200'
210'
220'
230'
240'
250'
260'
270'
280'
290'
300'
310'

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Ware River
MASSAC
Springfield

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

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Deerfield River (usgen New England) - Great River Hydro Cr

Deerfield River Access

I- 91

STILLWATER RD

DE-W5

DE-W4

DE-W6

DE-VP-550

DE-WS5

DE-WS4

DE-WS6

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550

Resource Areas Reviewed:
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Gardner

Springfield

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- Parcel Boundaries

Article 97 Lands

- Dept. of Fish & Game
- Private

*Indicates Layers Set to Transparency

N

1 inch = 200 feet

0 100 200

Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA
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MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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105 8
105 7
104 1
94 19
Mill Village
105 6
111 64
111 63
MILL VILLAGE RD
DE-W10
DE-W9
DE-W11
DE-WS11
DE-S2
547
546
545
160'
180'
190'
200'
210'
220'
230'
240'
250'
260'
170'

Resource Areas Reviewed:
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*Indicates Layers Set to Transparency

- Town Boundary
- Parcel Boundaries

Article 97 Lands

- Private

N

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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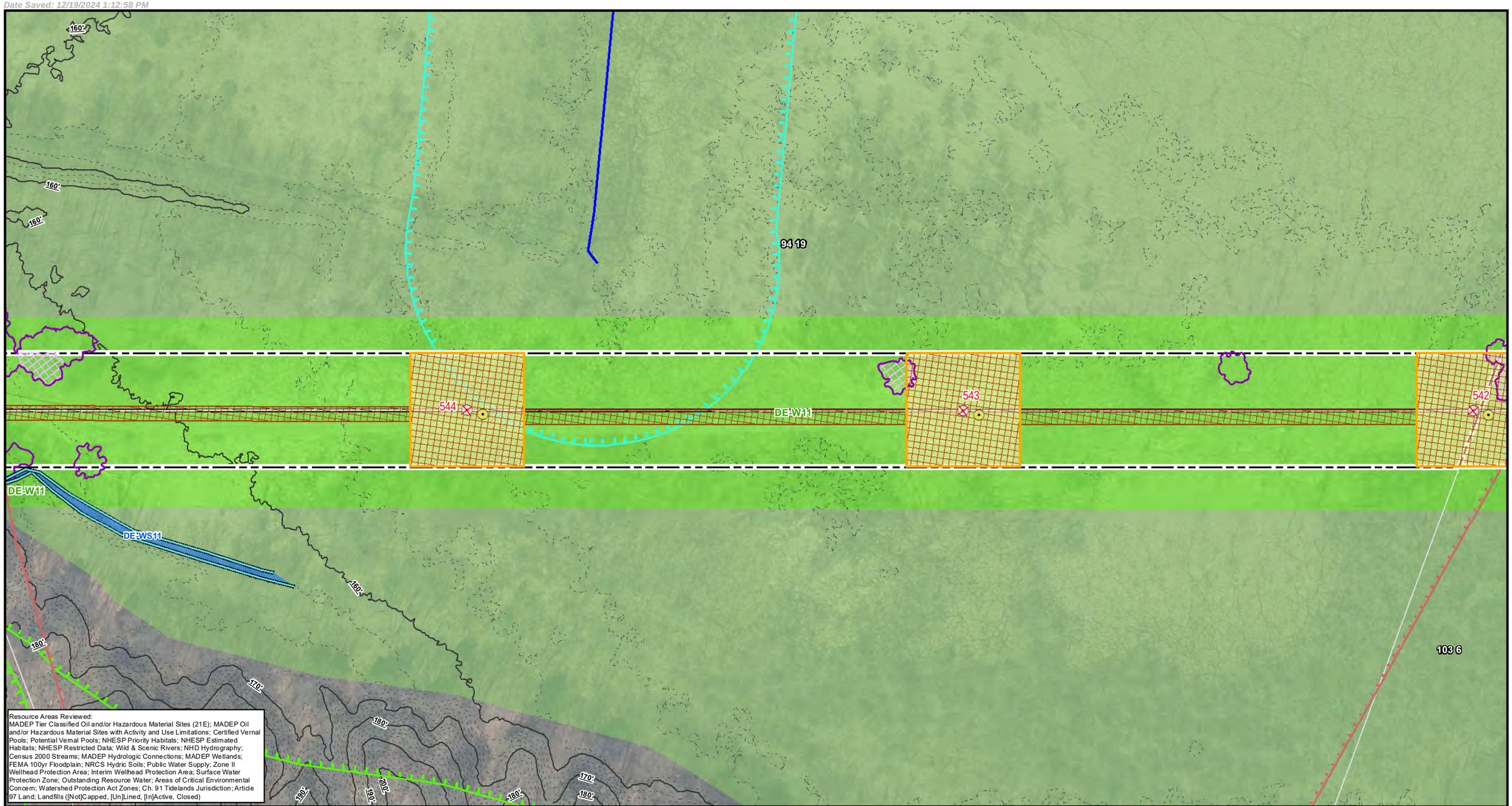

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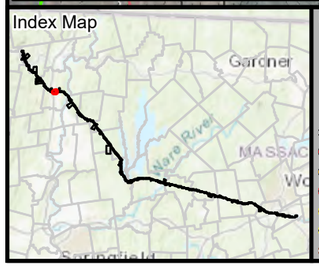

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Article 97 Lands

- Private

N

1 inch = 100 feet

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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Mill Village
94 19
542
541
540
DE-W11
DE-S3
DE-S3
GREENFIELD RD
5
103 8
103 9
103 2
103 1
103 6
113 8
113 7.1
113 9
Sheet 42
Sheet 42A
DE-W12
160'
170'
180'
190'
200'
210'
220'
230'

Resource Areas Reviewed:
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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

MassGIS
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GREENFIELD RD

CLARK CROSS RD

Mill Village

Sheet 42

Sheet 42A

113 9 | 113 17 | 113 10 | 113 11 | 103 1 | 113 7 | 113 7.1 | 113 4 | 113 3 | 103 2 | 113 6 | 113 5 | 113 2 | 103 6 | 113 8 | 123 26 | 123 28

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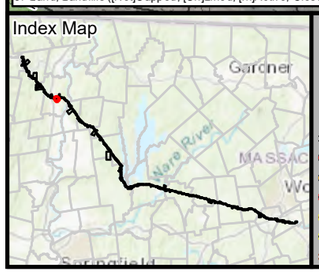

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA
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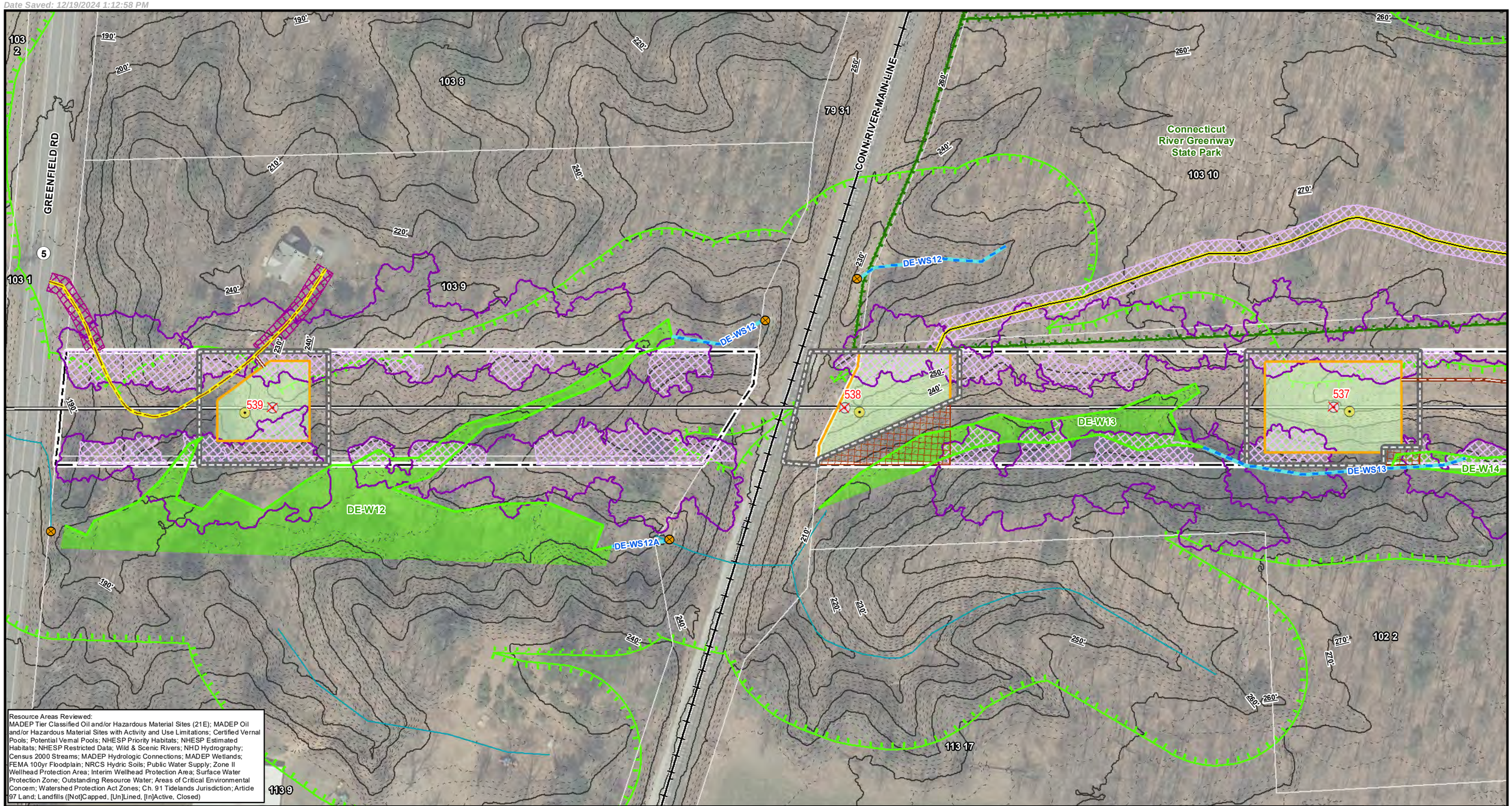

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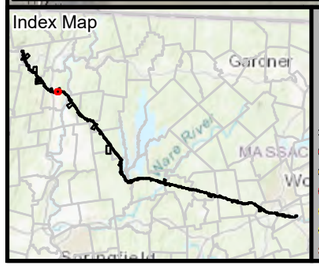

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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

MassGIS
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Sheet 44

Connecticut River Greenway State Park

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102 2

102 1

113 17

STEAM MILL RD

DE-S5
DE-WS14
DE-WS15
DE-W14
DE-W15
DE-WS13

536
535
534

SPAN STREAM
SPAN STREAM

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Gardner
Springfield

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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

MassGIS
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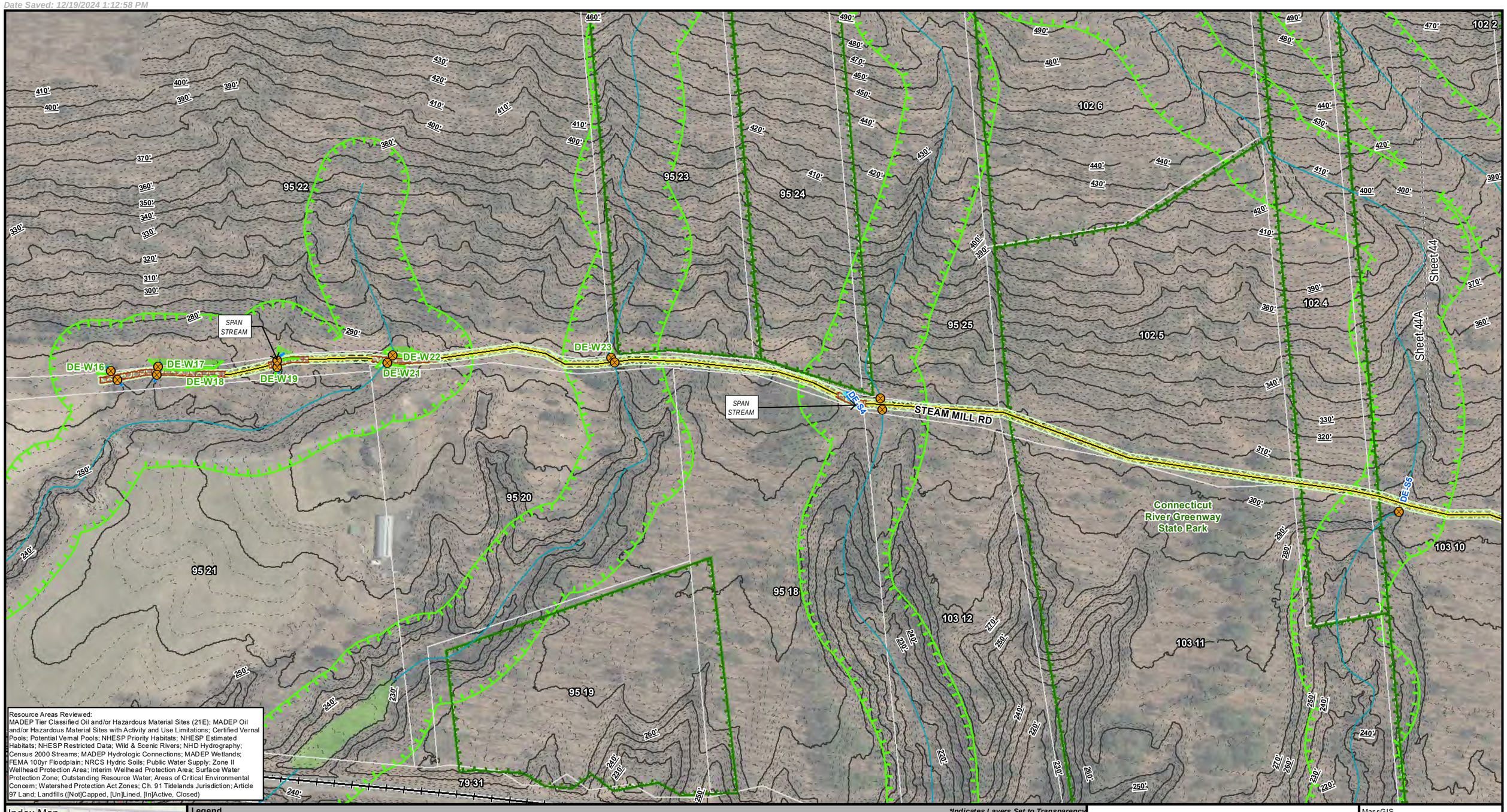

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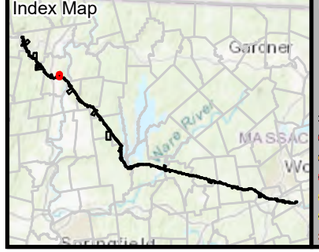

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1 inch = 200 feet
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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

MassGIS
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103 10

Connecticut River Greenway State Park

102 2

102 7

102 1

113 17

HIKING TRL

DE-S6

531

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Resource Areas Reviewed:
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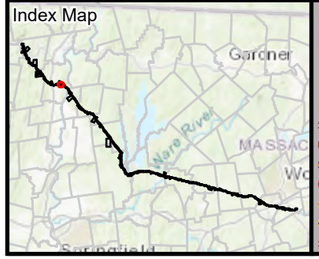

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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

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530
529
528
102 7
115 1
SPAN STREAM
DE-ST
Connecticut River Greenway State Park

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- DCR-State Parks & Recreation

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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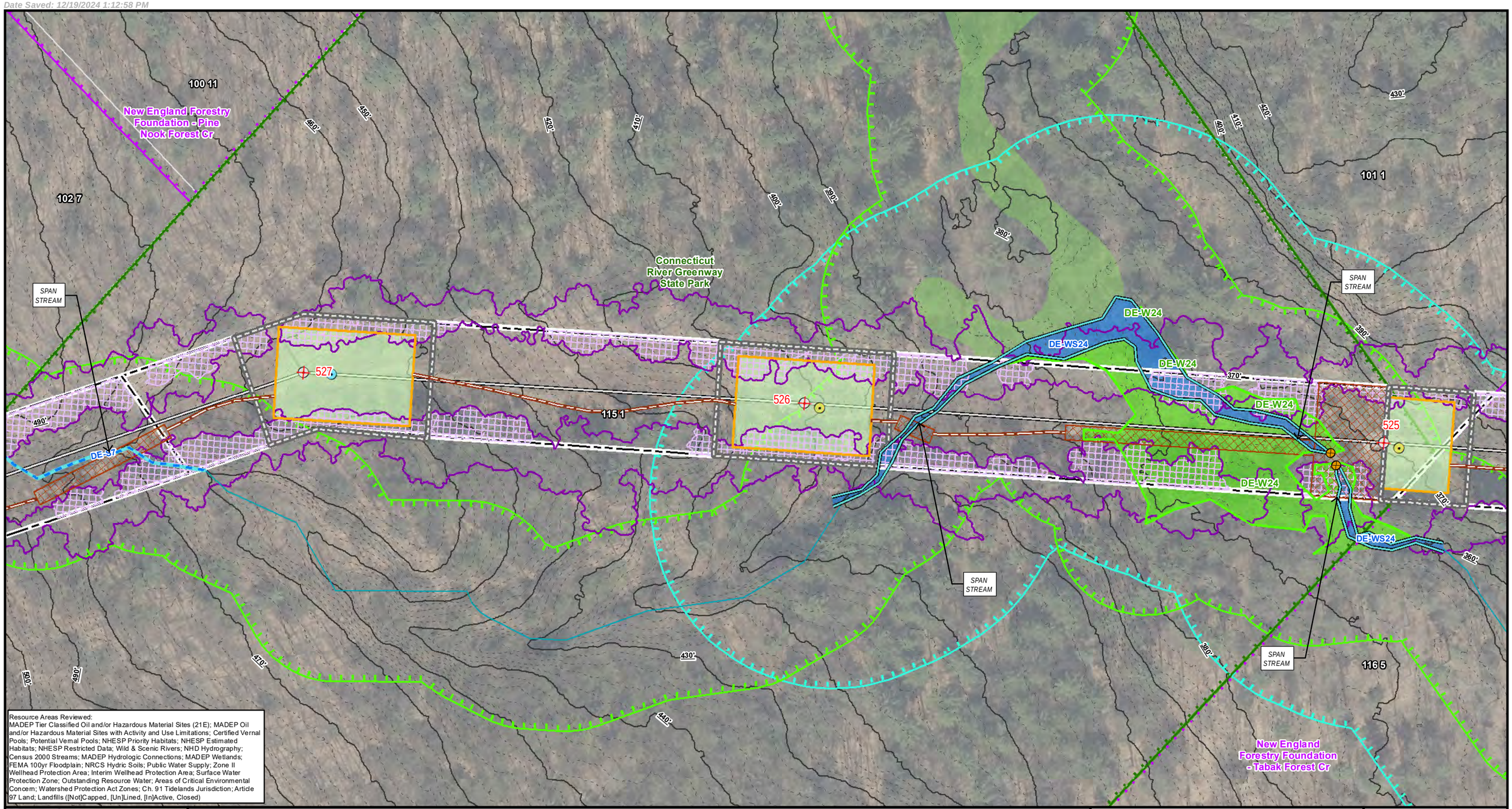

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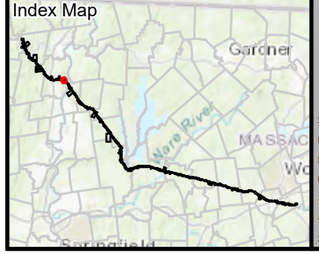

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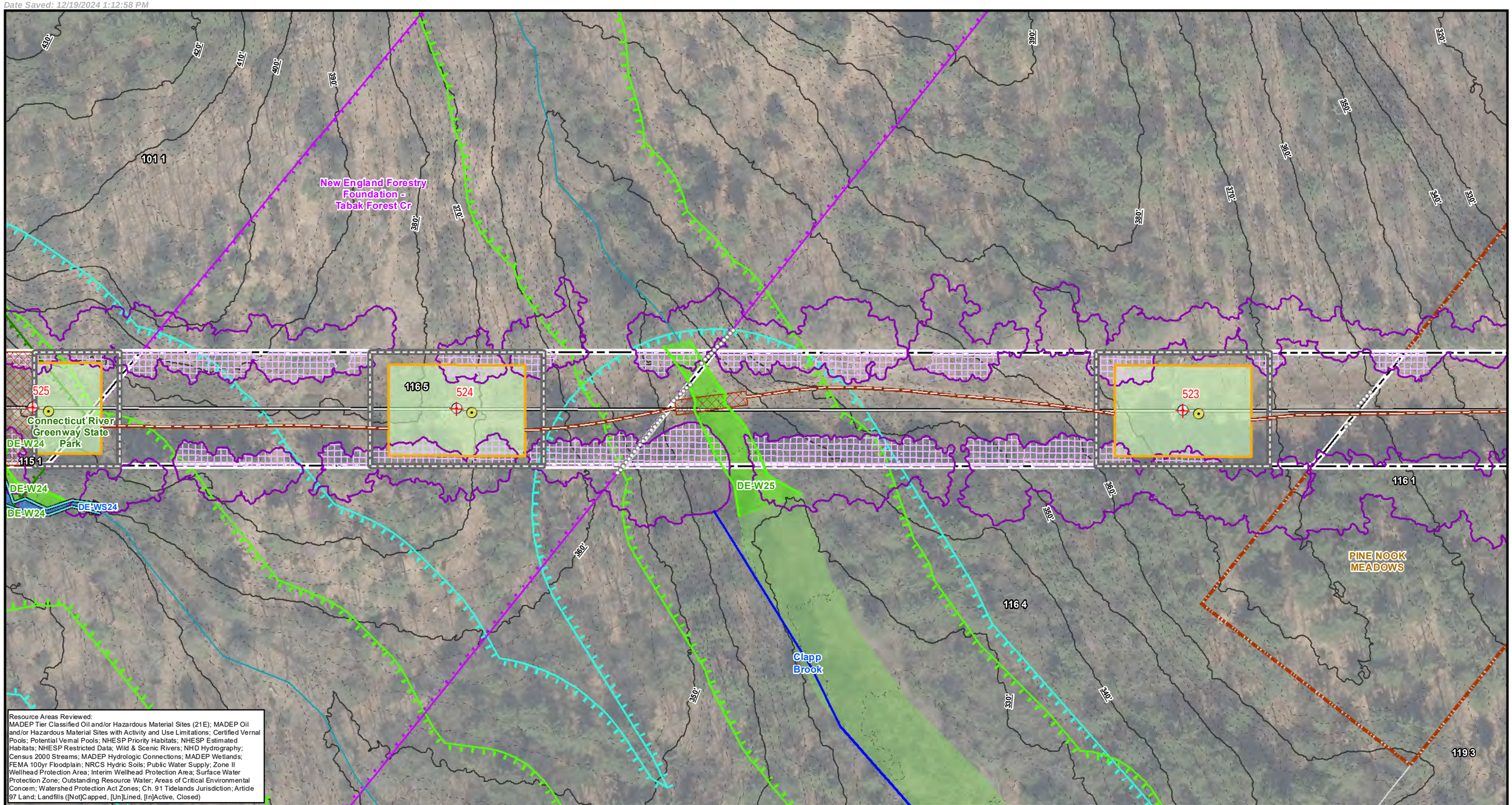

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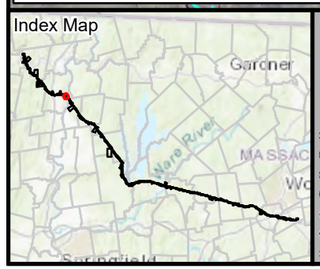

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Feet

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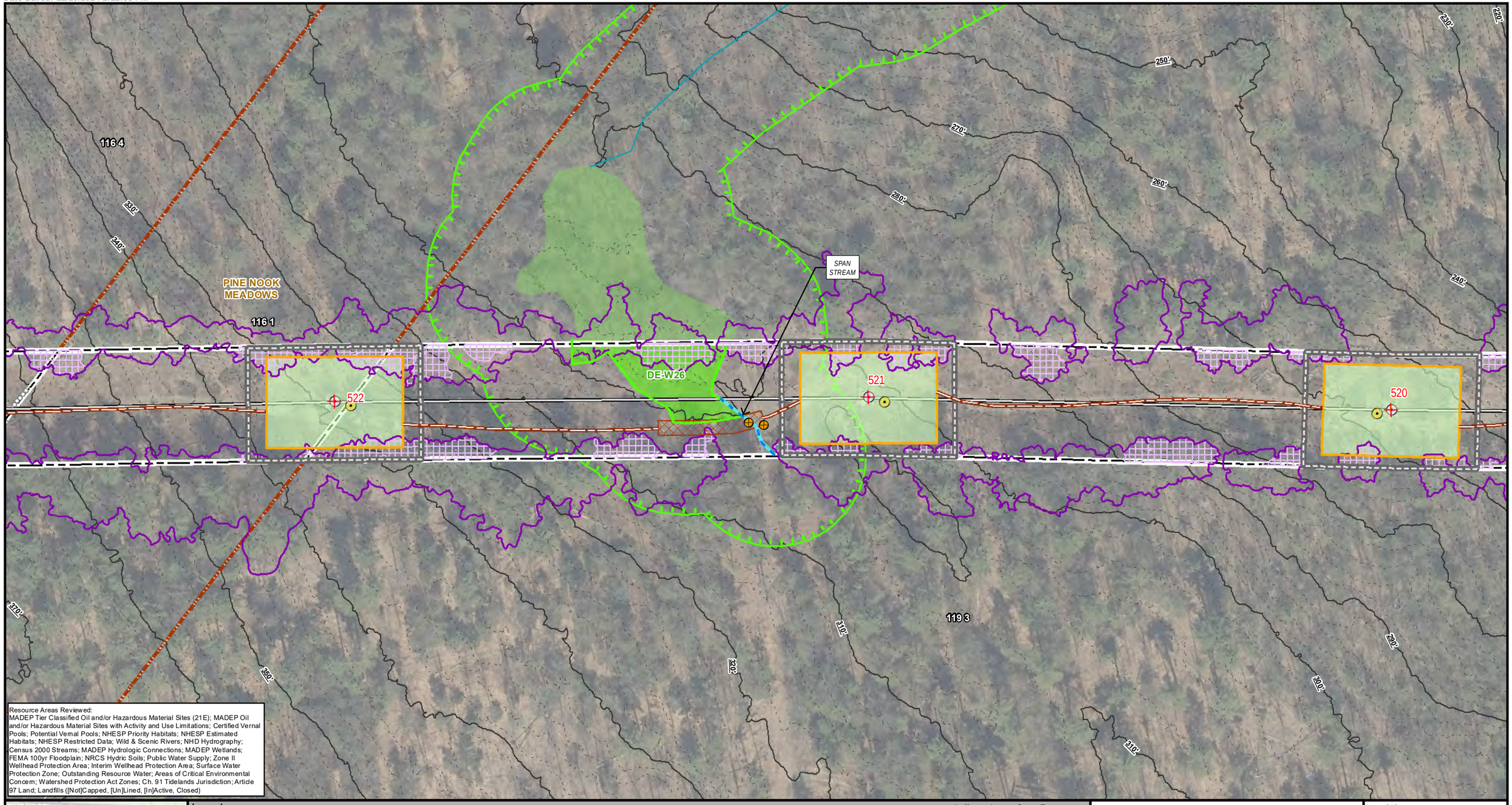

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- Town Boundary
- Parcel Boundaries

N

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Deerfield, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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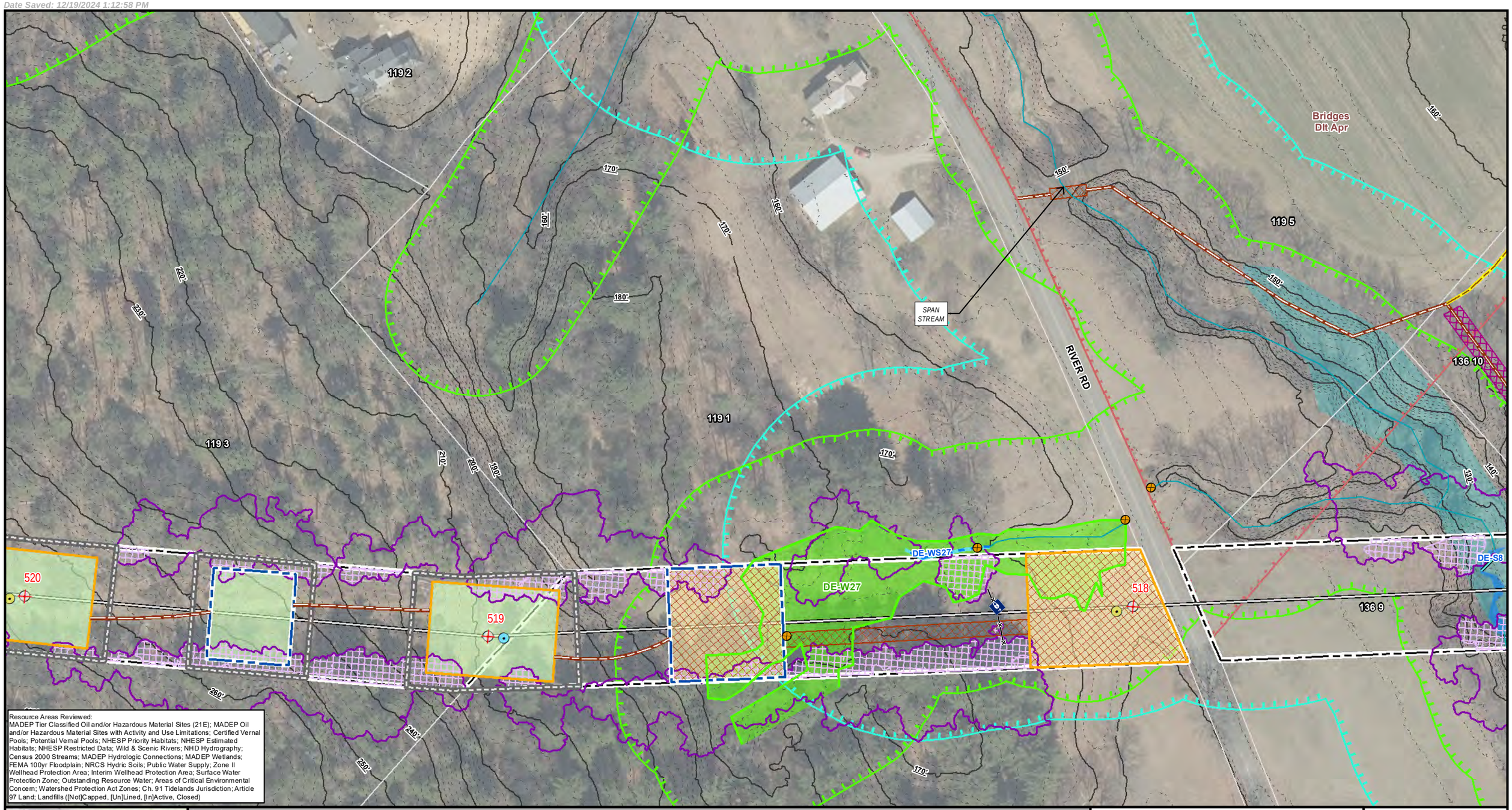
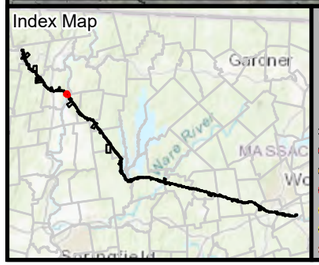


Index Map



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Article 97 Lands

- Private

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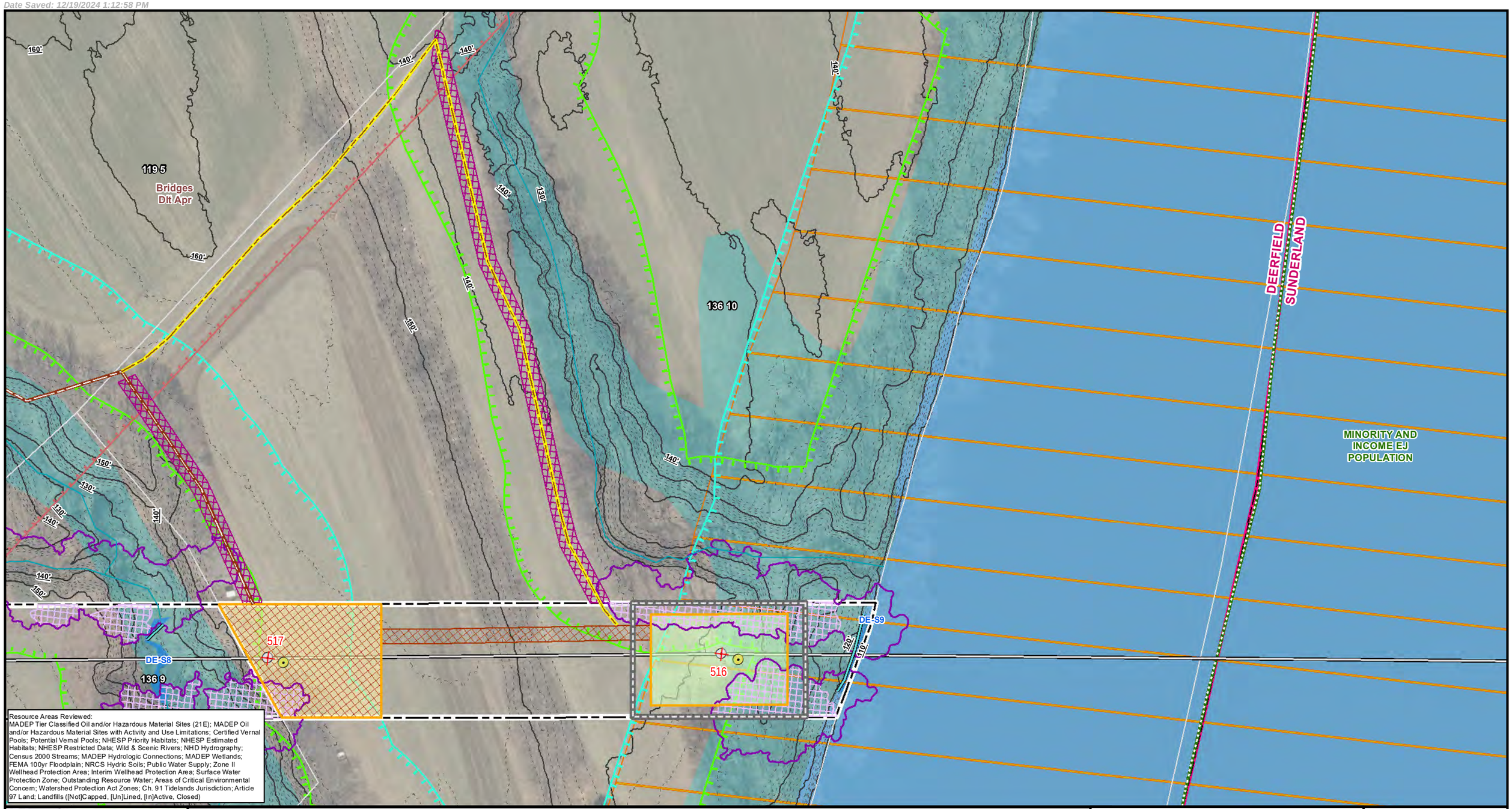

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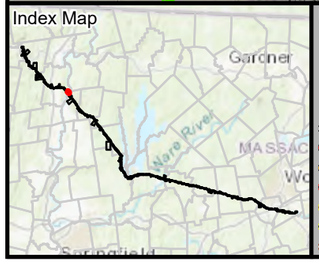

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Environmental Justice Populations 2020

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Deerfield & Sunderland, MA

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Connecticut River Greenway State Park

GUNN CROSS RD

1067 1066 1076 1068 1069 1075 1070

Gunn Brook

515 514

DE-S9

SU-W1 SU-W1 SU-WS1 SU-W2 SU-WS2

MINORITY AND INCOME EJ POPULATION

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Sheet 52A

Shilling

FALLS RD

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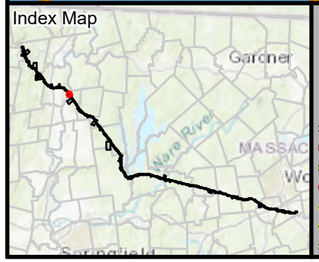

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Article 97 Lands

- DCR-State Parks & Recreation
- Private

Environmental Justice Populations 2020

- Minority and Income

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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Sunderland, MA

MassGIS
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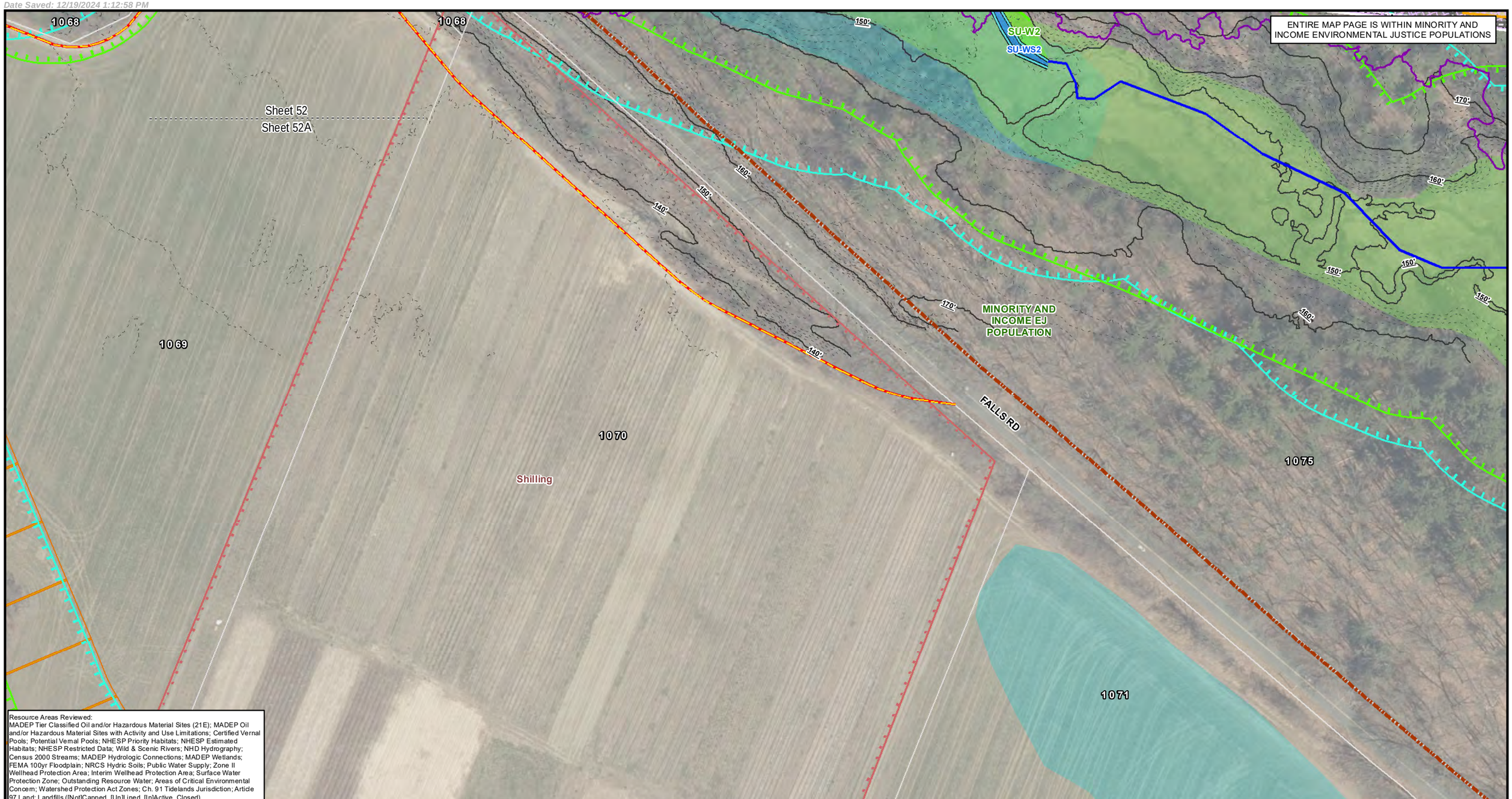

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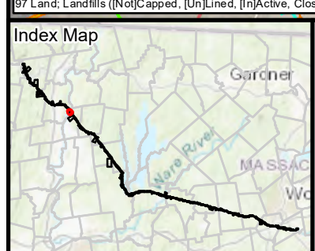

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Article 97 Lands

- Private

Environmental Justice Populations 2020

- Minority and Income

**Indicates Layers Set to Transparency*

N

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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Sunderland, MA
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MassGIS
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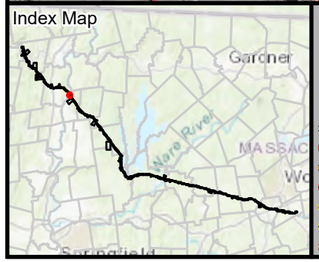

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Environmental Justice Populations 2020

- Minority and Income

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Sunderland, MA
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SPAN STREAM

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- Stonewall
- Existing Treeline
- Tree Removal
- Selective Tree Removal
- Pruning

*Indicates Layers Set to Transparency

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- Parcel Boundaries

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- Dept. of Fish & Game
- Private

Environmental Justice Populations 2020

- Minority and Income

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Sunderland, MA
Page 54 of 240

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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10 86
10 76
10 142
10 147
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10 118

MINORITY AND INCOME EJ POPULATION

MONTAGUE RD

47

SU-WS5
SU-WS5
SU-W5
SU-W6

Patterson Donald F Jr Apr

Sheet 54A
Sheet 54

270'
280'
290'
300'
310'
320'
330'
340'
250'

Resource Areas Reviewed:
MADEP Tier Classified Oil and/or Hazardous Material Sites (21E); MADEP Oil and/or Hazardous Material Sites with Activity and Use Limitations; Certified Vernal Pools; Potential Vernal Pools; NHESP Priority Habitats; NHESP Estimated Habitats; NHESP Restricted Data; Wild & Scenic Rivers; NHD Hydrography; Census 2000 Streams; MADEP Hydrologic Connections; MADEP Wetlands; FEMA 100yr Floodplain; NRCS Hydric Soils; Public Water Supply; Zone II Wellhead Protection Area; Interim Wellhead Protection Area; Surface Water Protection Zone; Outstanding Resource Water; Areas of Critical Environmental Concern; Watershed Protection Act Zones; Ch. 91 Tidelands Jurisdiction; Article 97 Land; Landfills ([Not]Capped, [Un]Lined, [In]Active, Closed)

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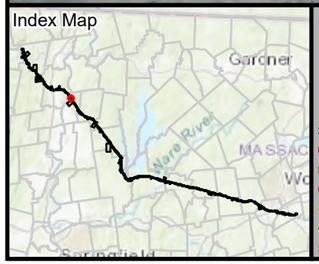

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Environmental Resources Map

Sunderland, MA
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Index Map
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Springfield

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Environmental Justice Populations 2020
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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Sunderland, MA

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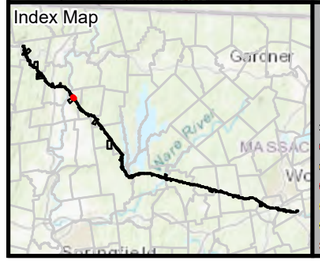
Index Map



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- Dept. of Fish & Game

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Sunderland, MA
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MassGIS
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SU-W13
SU-S25
SU-S27
SU-VP-502-3
SPAN STREAM
SPAN STREAM
N MOUNTAIN RD
Mt. Toby Wma
MINORITY AND INCOME EJ POPULATION
UNKNOWN
UNKNOWN
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Sheet 56A
Sheet 56A
Sheet 56B
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2024
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2012
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1 inch = 200 feet
0 100 200
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Sunderland, MA
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Sheet 56A
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MINORITY AND INCOME EJ POPULATION

UNKNOWN

SU-VP-502-2
SU-VP-502-3

SU-S27
SU-WS26
SU-W26
SU-WS26
SU-W24
SU-WS24
SU-W24
SU-WS24
SU-W24
SU-W23
SU-WS23
SU-W23
SU-WS23
SU-W22
SU-W21
SU-W20
SU-W20

N BEARS DEN DR
BEARS DEN DR
PARK RD
N MOUNTAIN RD
CLAYBROOK RD
GUNN MTN RD

Mt. Toby Wma

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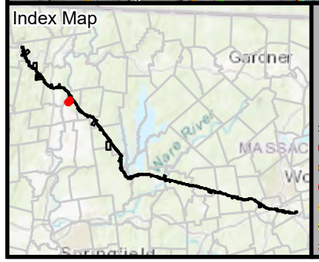

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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

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MINORITY AND INCOME EJ POPULATION
SPAN STREAM
SPAN STREAM
SU-W13
502
SU-W14
SU-WS13
SU-WS13A
SU-S2
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3010
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3032
3031
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209
Mt. Toby Wma
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497
MINORITY AND INCOME EJ POPULATION

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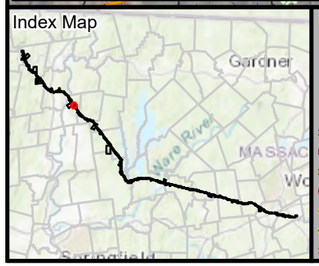

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Indicates Layers Set to Transparency

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Article 97 Lands

- Dept. of Fish & Game

Environmental Justice Populations 2020

- Minority and Income

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Sunderland, MA
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MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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ENTIRE MAP PAGE IS WITHIN MINORITY AND INCOME ENVIRONMENTAL JUSTICE POPULATIONS

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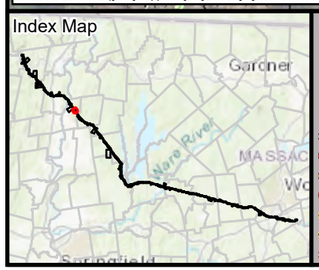

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Sunderland, MA

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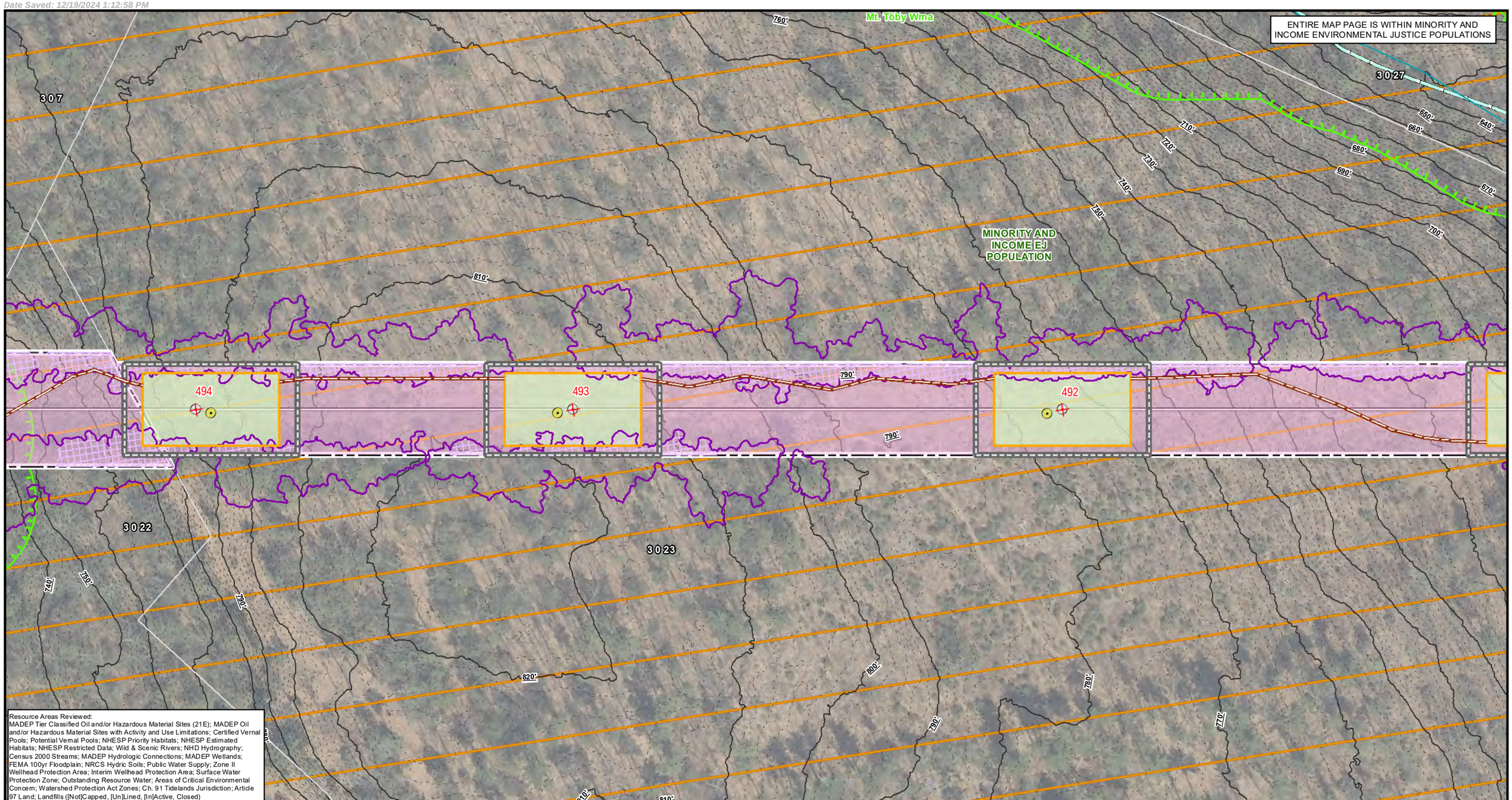

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Environmental Resources Map

Sunderland, MA
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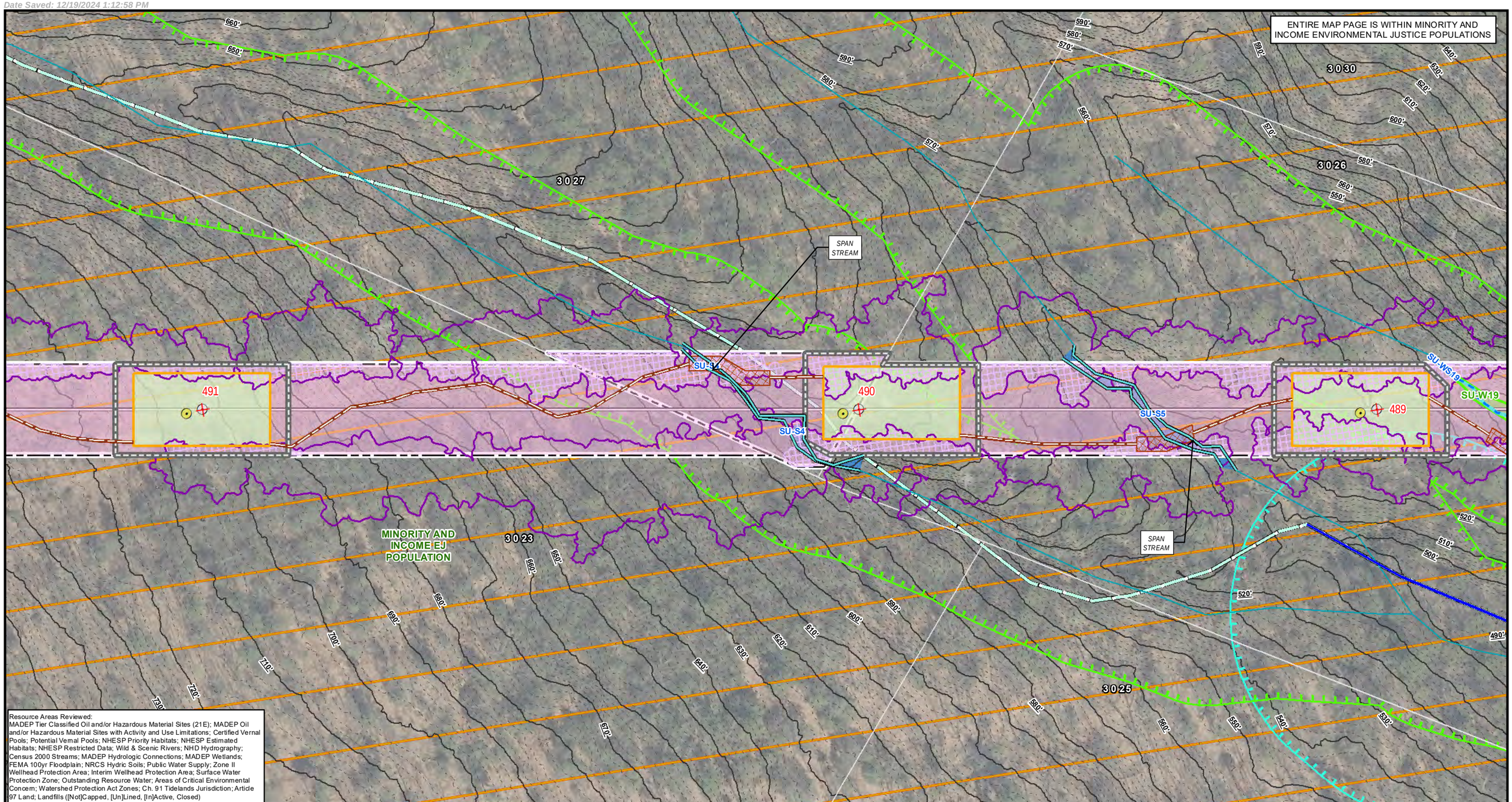

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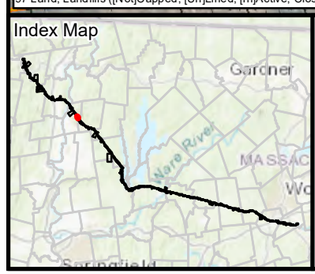

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Sunderland, MA

MassGIS
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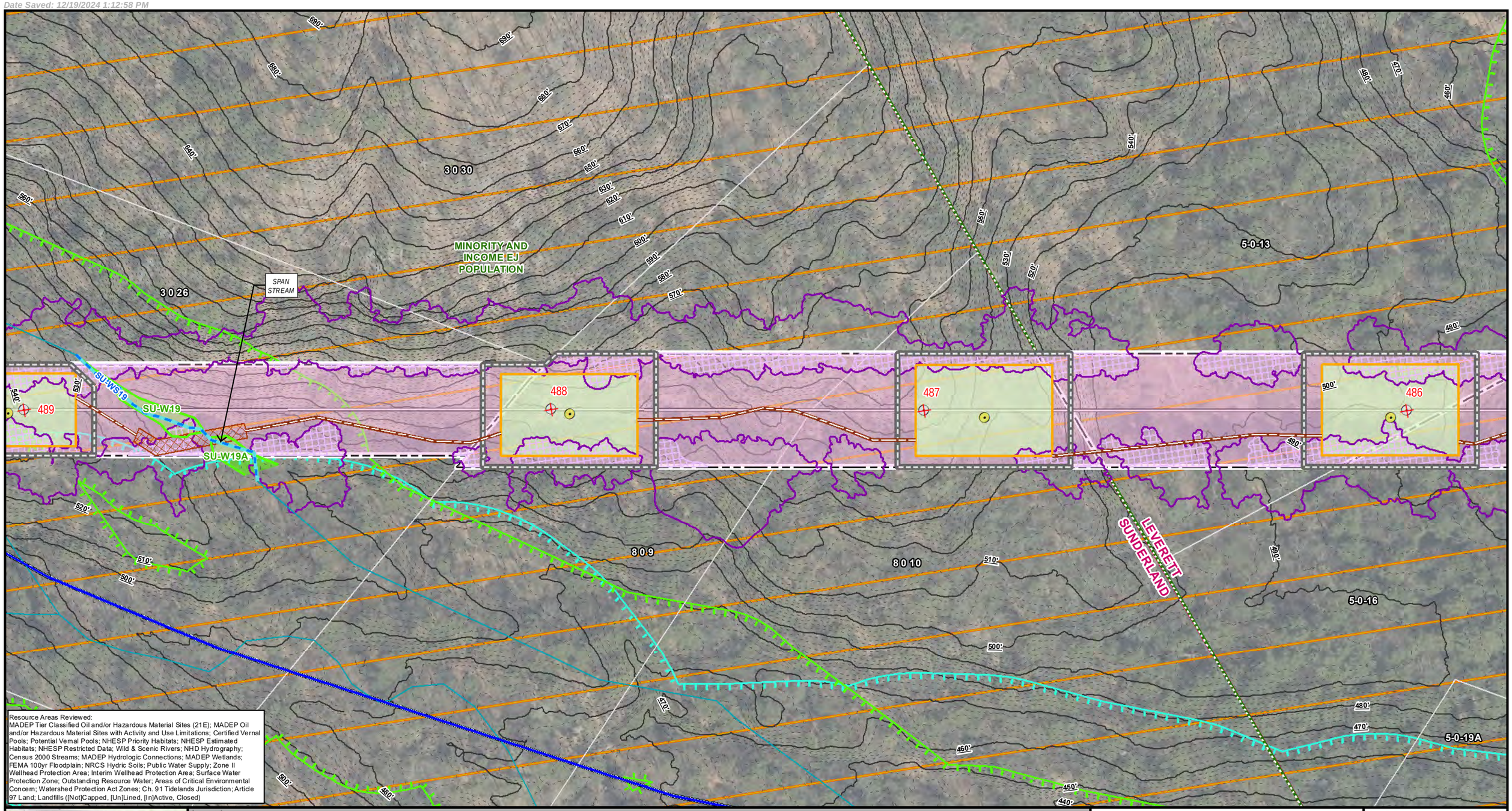

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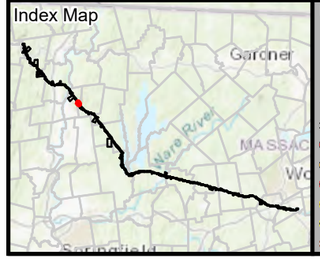

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Environmental Justice Populations 2020

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Sunderland & Leverett, MA
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MassGIS
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SPAN STREAM

LE-S1

LE-W1

LE-W1

LE-WS1

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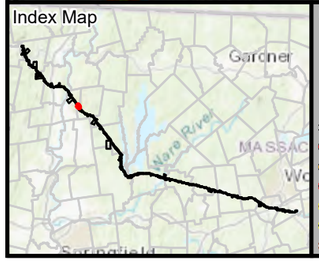

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

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Leverett, MA

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

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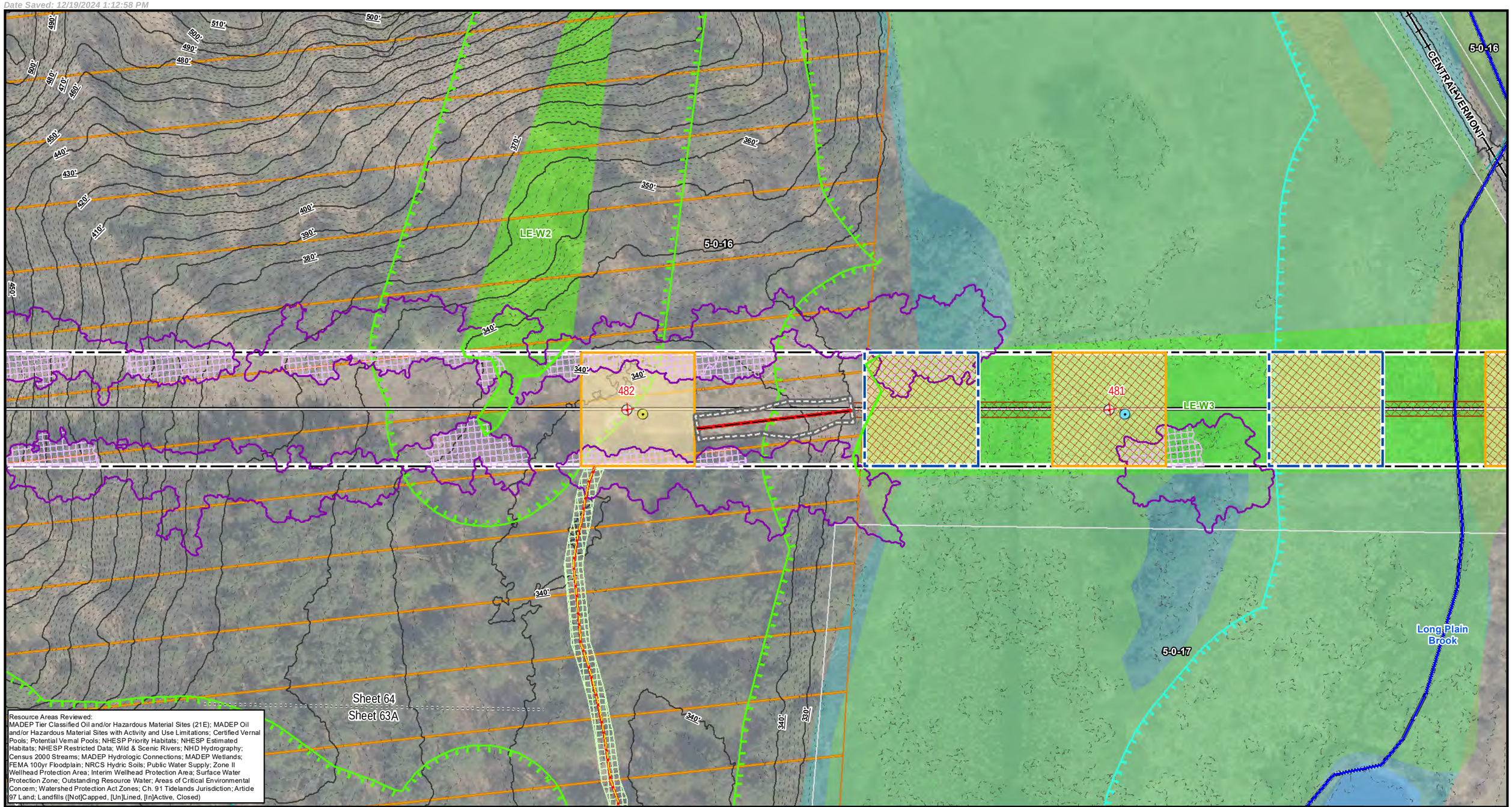

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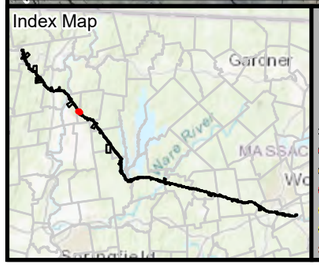

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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Leverett, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

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Leverett, MA
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MassGIS
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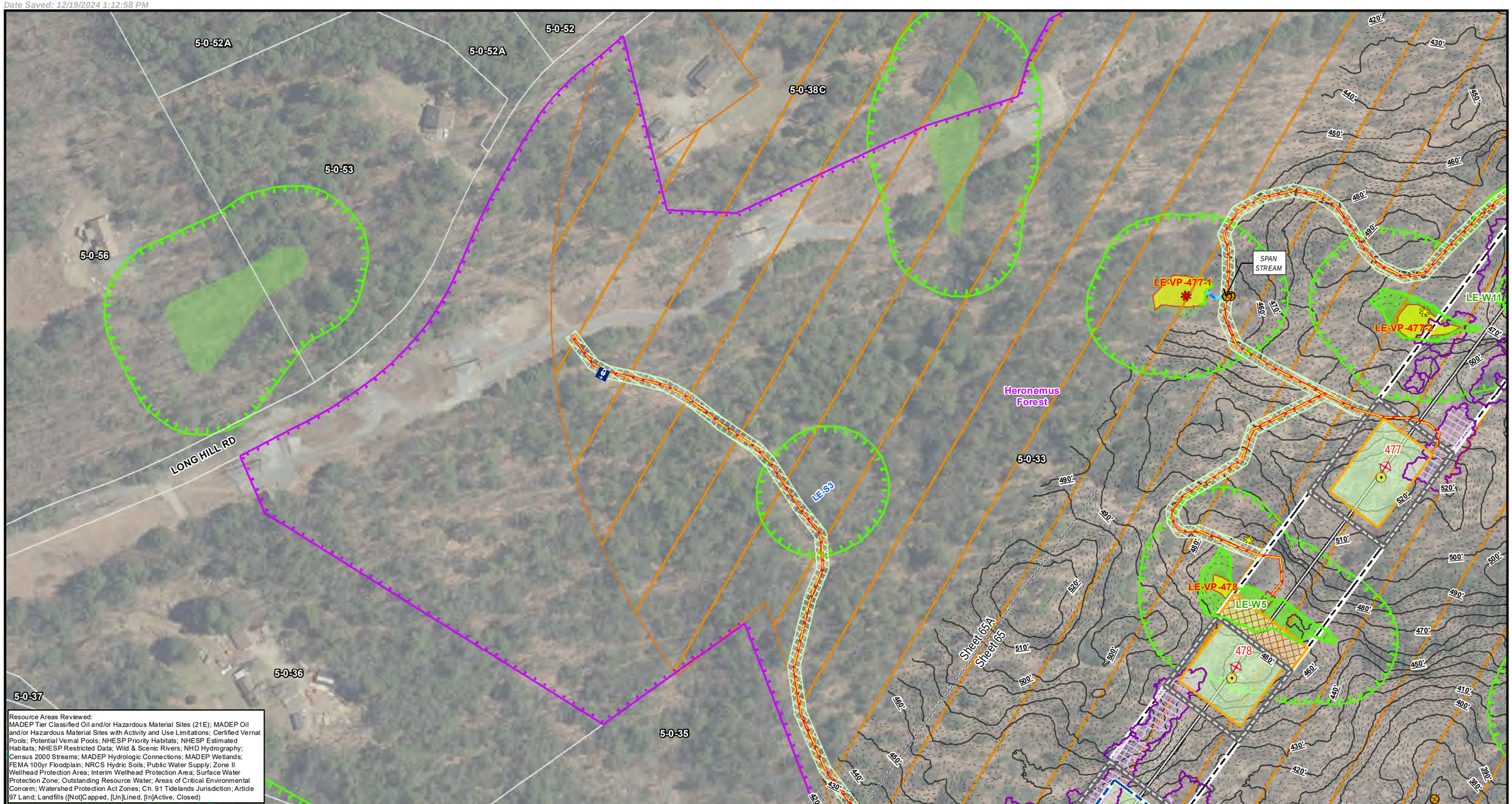

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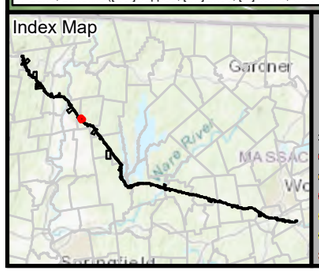

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0 75 150
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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Leverett, MA
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MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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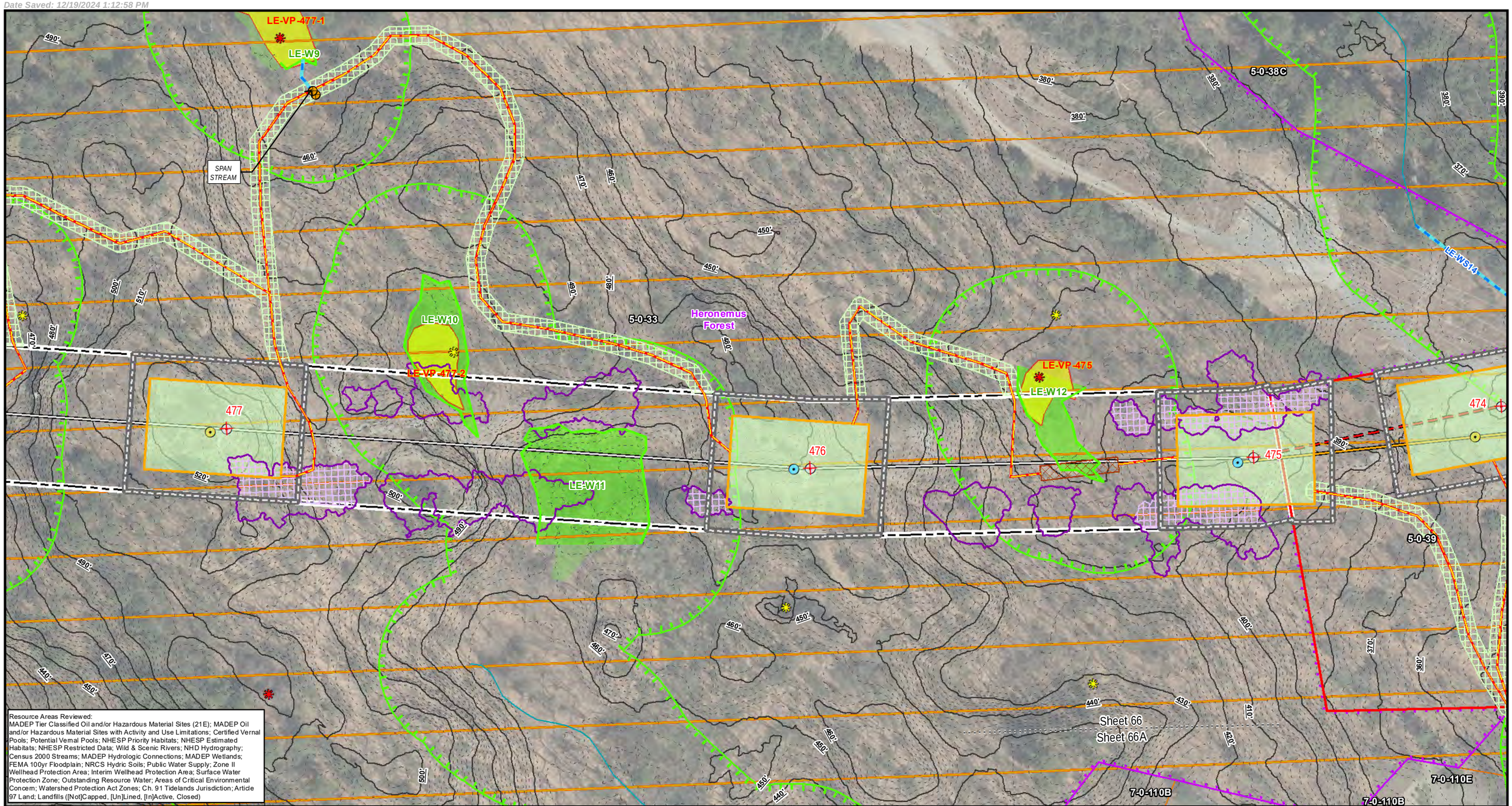

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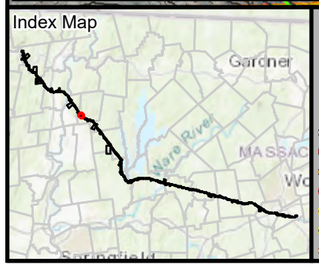

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

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MassGIS
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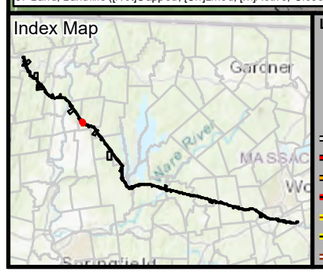

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

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MassGIS
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Environmental Resources Map

Leverett, MA

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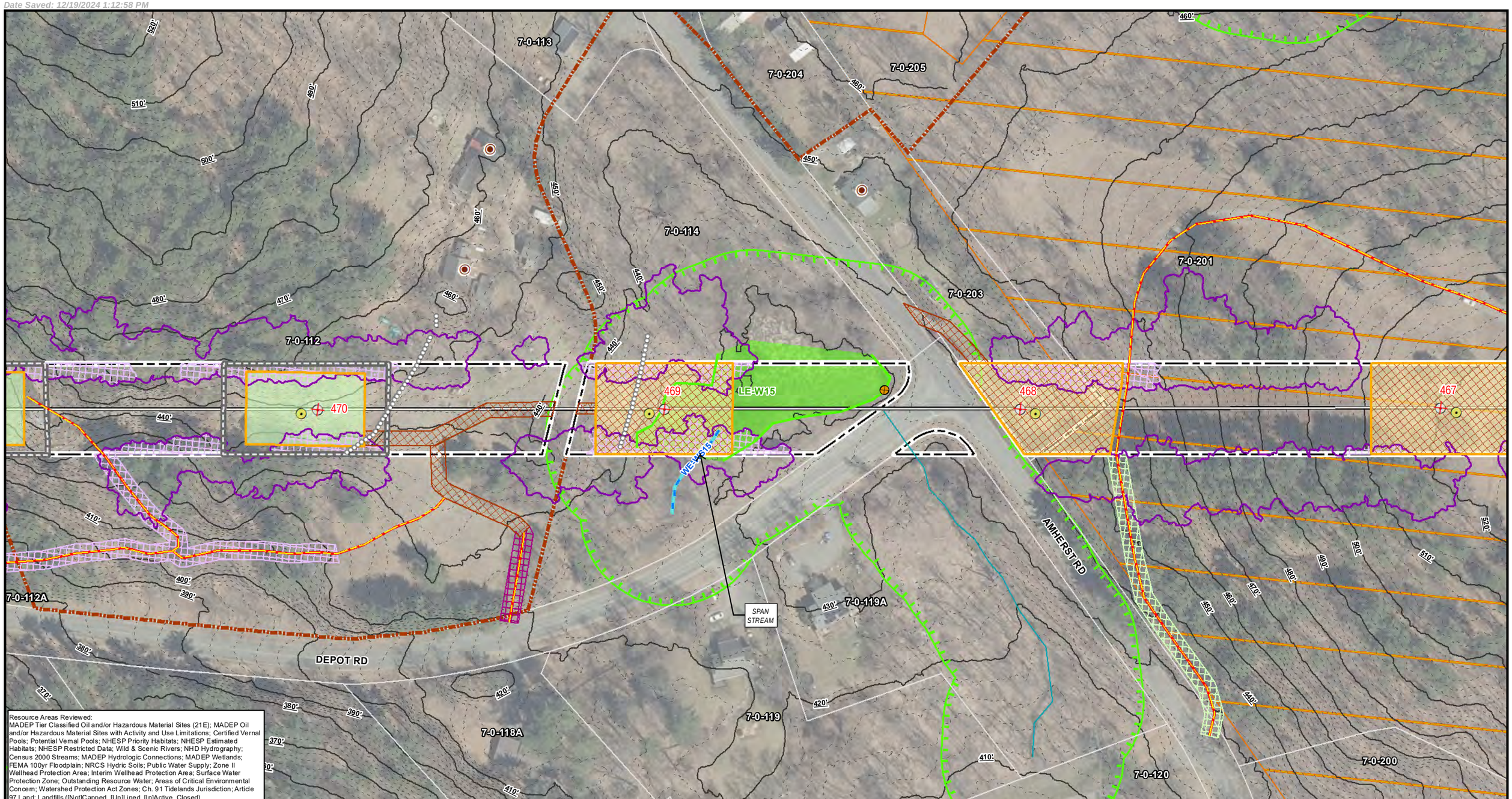

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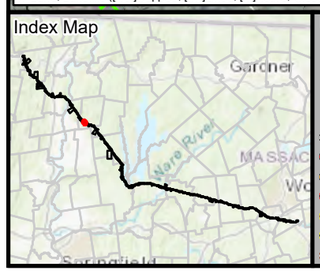

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

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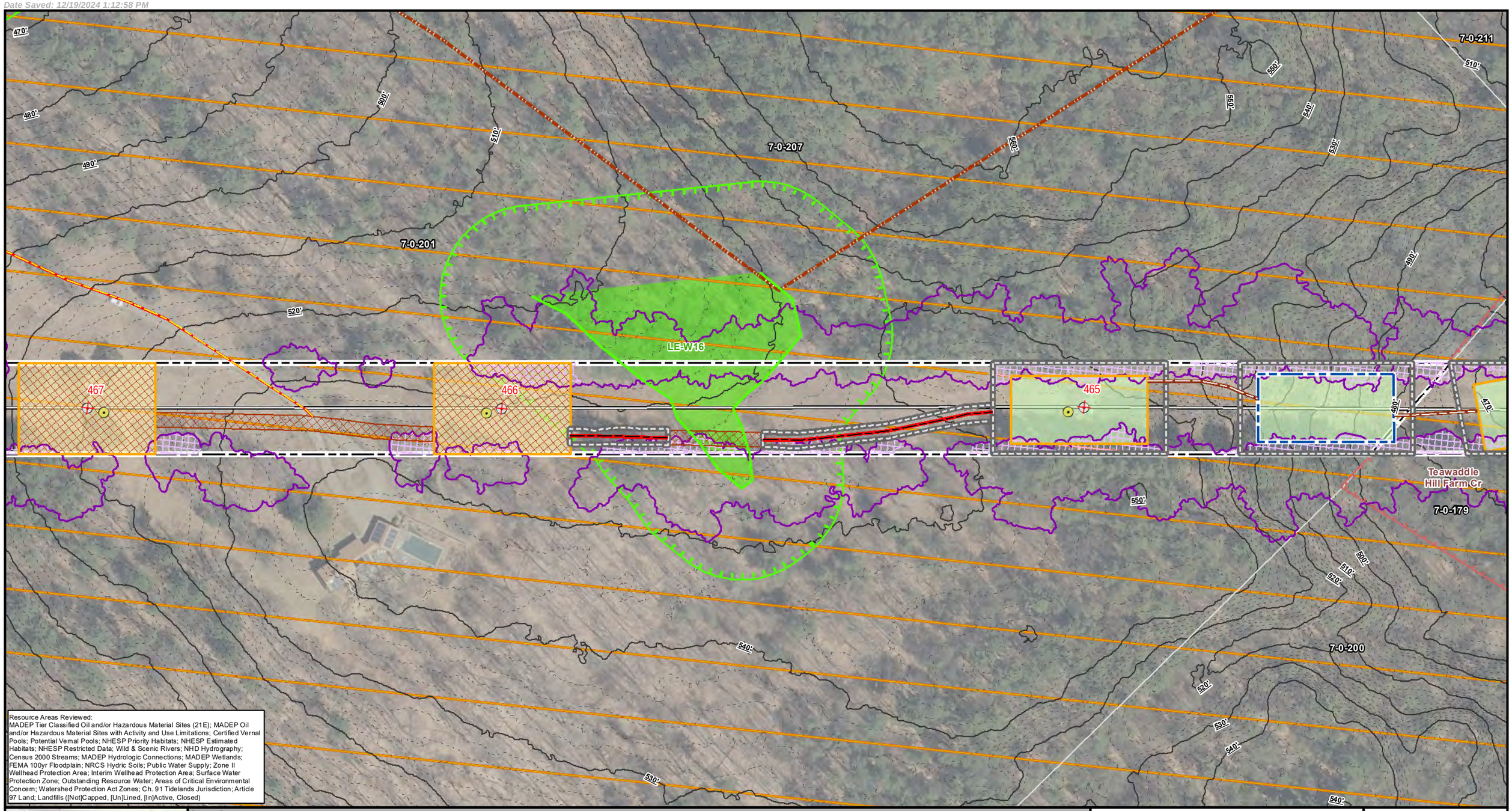

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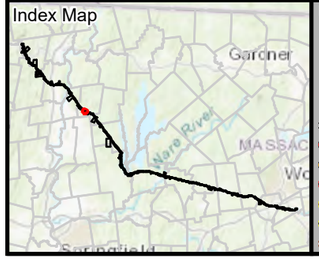

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Article 97 Lands

- Private

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Leverett, MA

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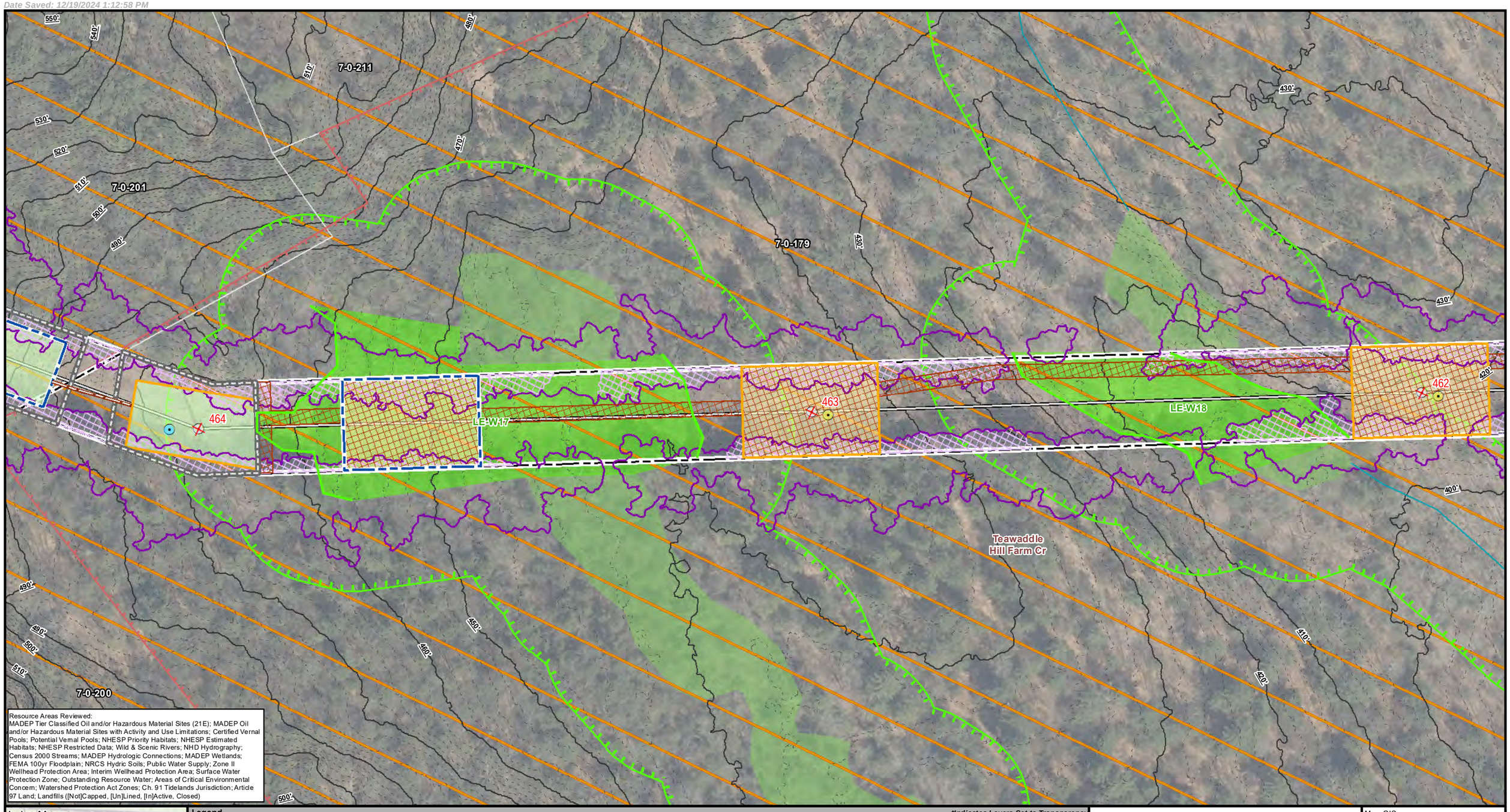

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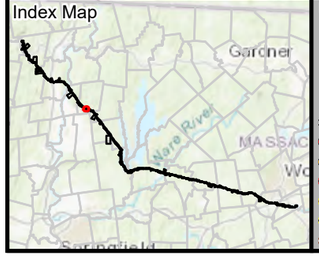

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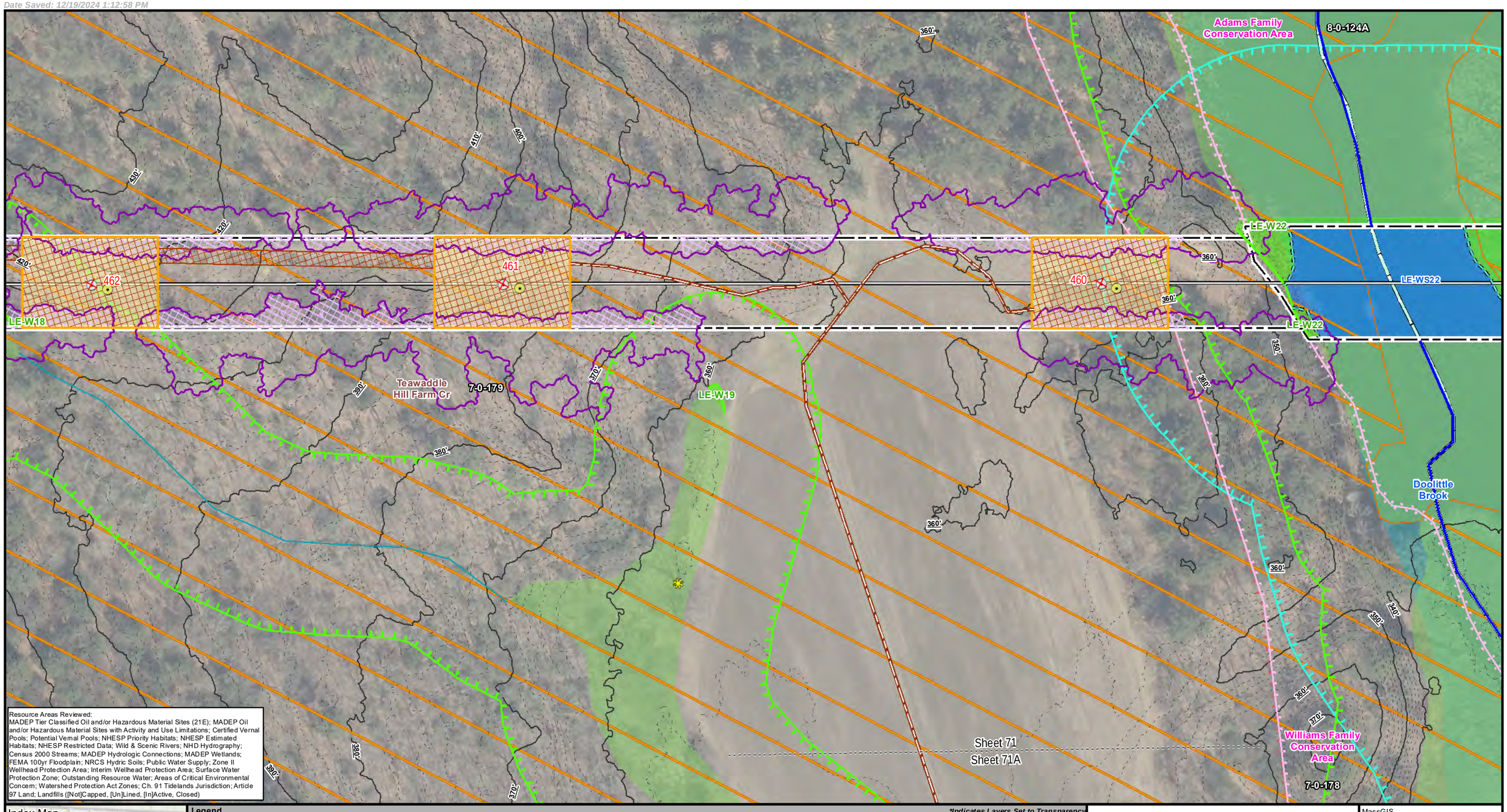

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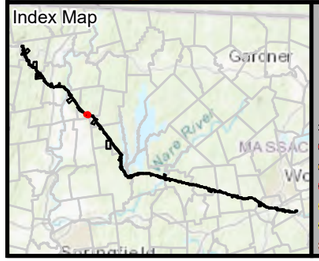

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Environmental Resources Map

Leverett, MA

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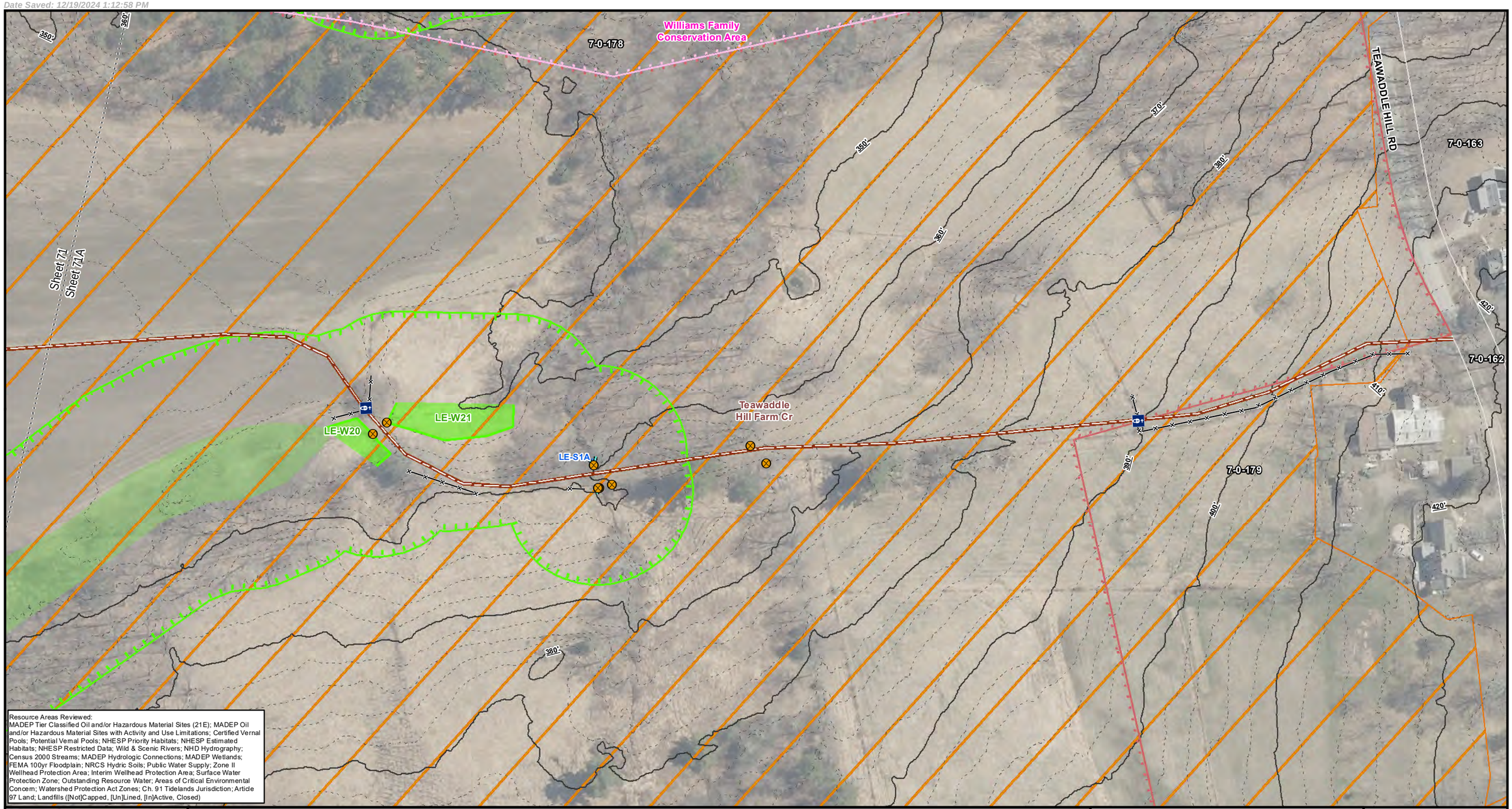

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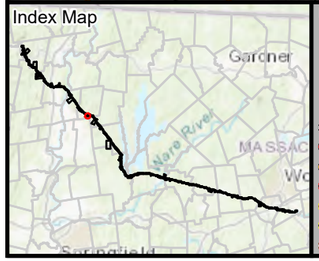

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Adams Family Conservation Area
8-0-124
LE-W23
LE-W25
LE-W24
LE-W22
LE-WS22
LE-WS23
459
458
457
350'
SPAN STREAM
Doolittle Brook
8-0-124A
8-0-125
7-0-175
340'

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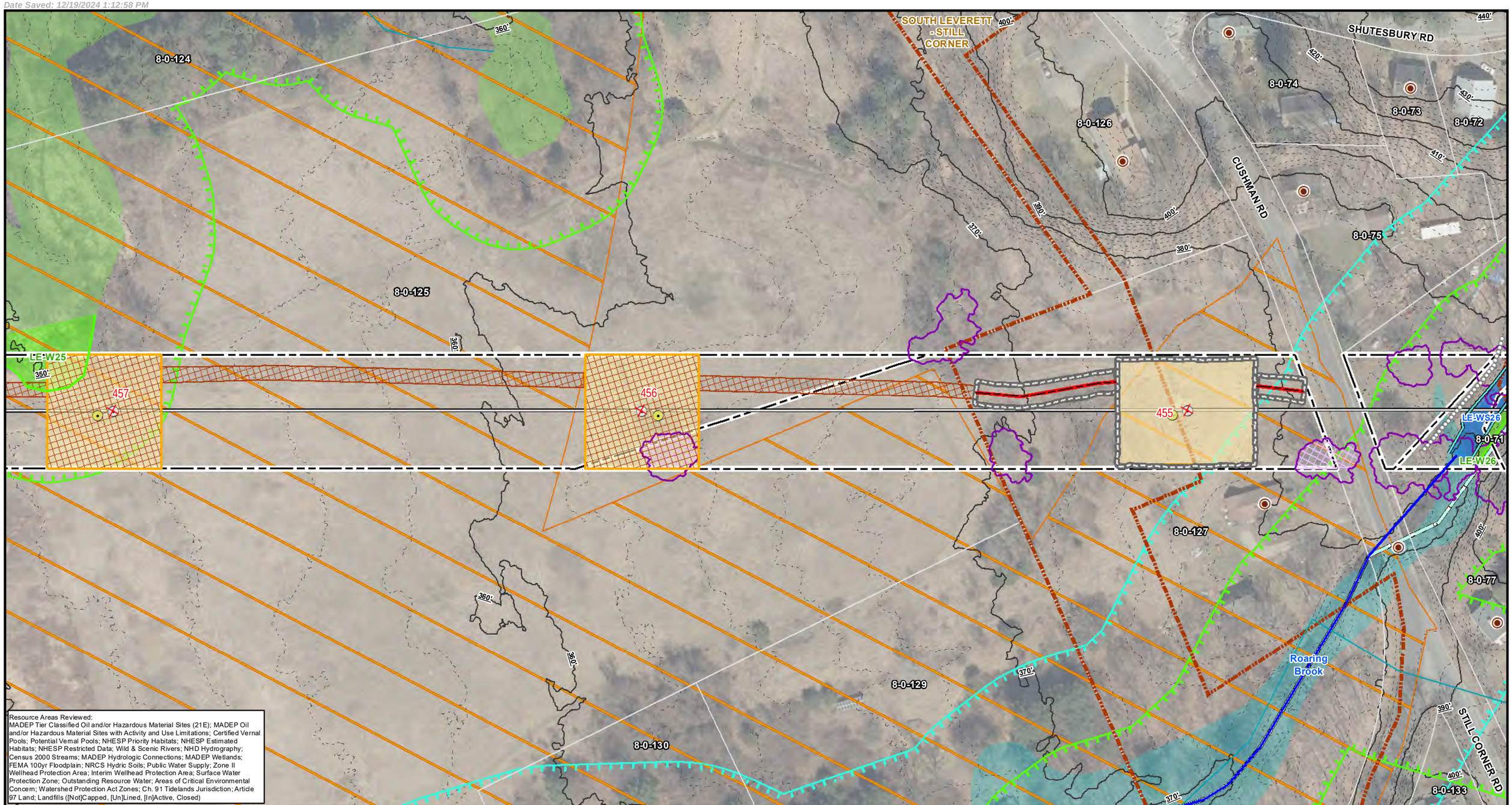

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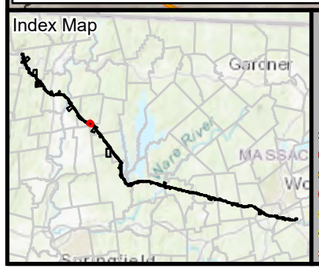

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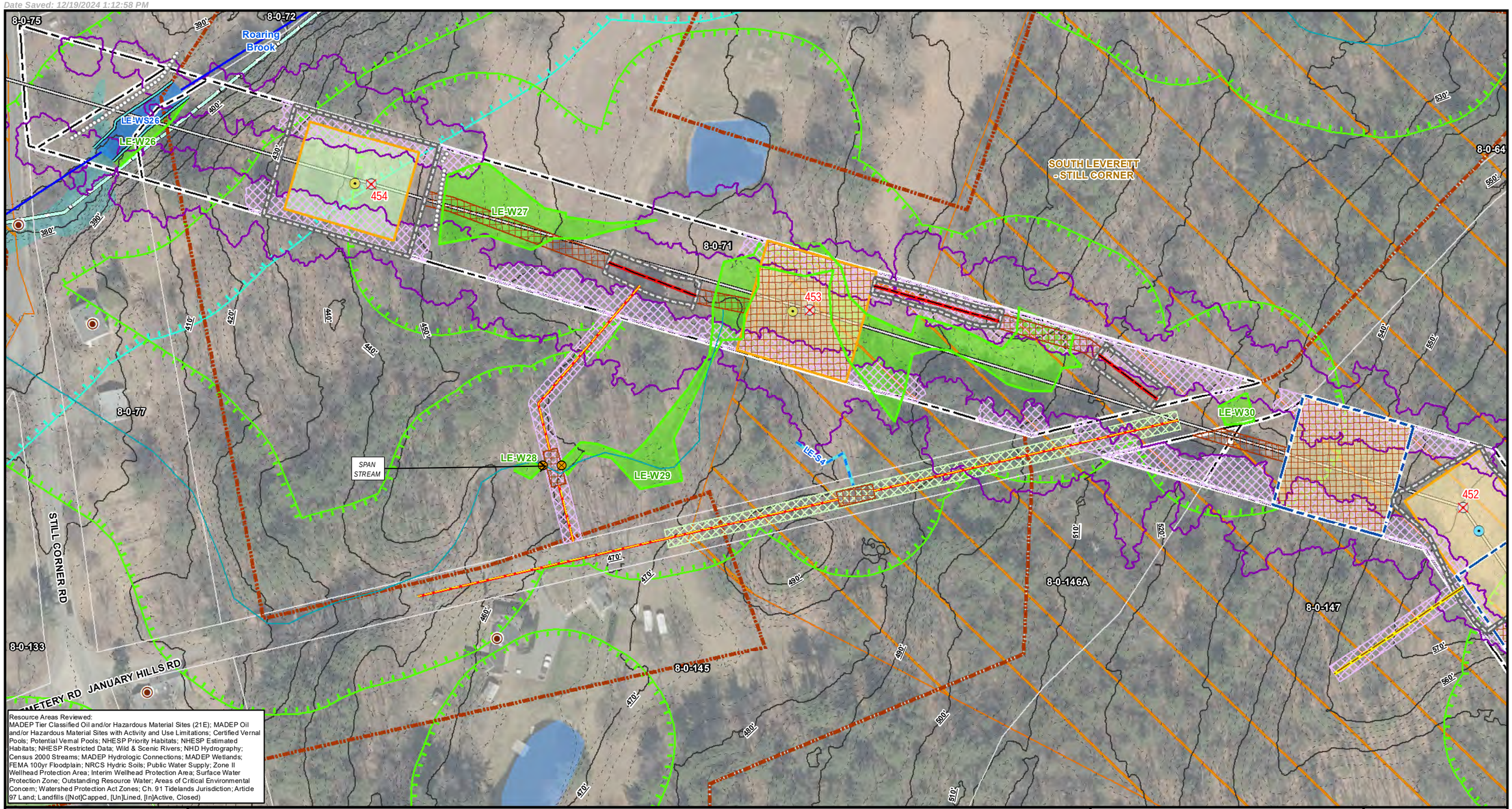

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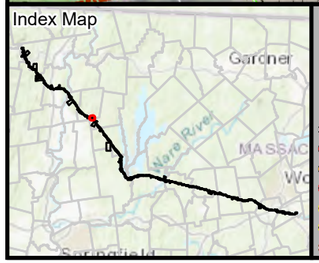

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N

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Leverett, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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OLD JANUARY HILL RD

LEVERETT
SHUTESBURY

SPAN STREAM

8-0-147

SPAN STREAM

Walter Cowls Jones Working Forest Wce

452

451

450

LE-W31

LE-WS32

LE-W32

SHU-W1

SHU-W1

Resource Areas Reviewed:
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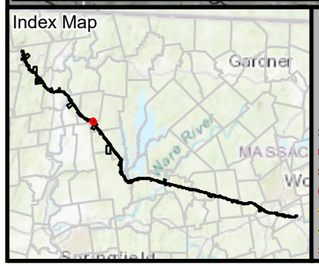

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Leverett & Shutesbury, MA

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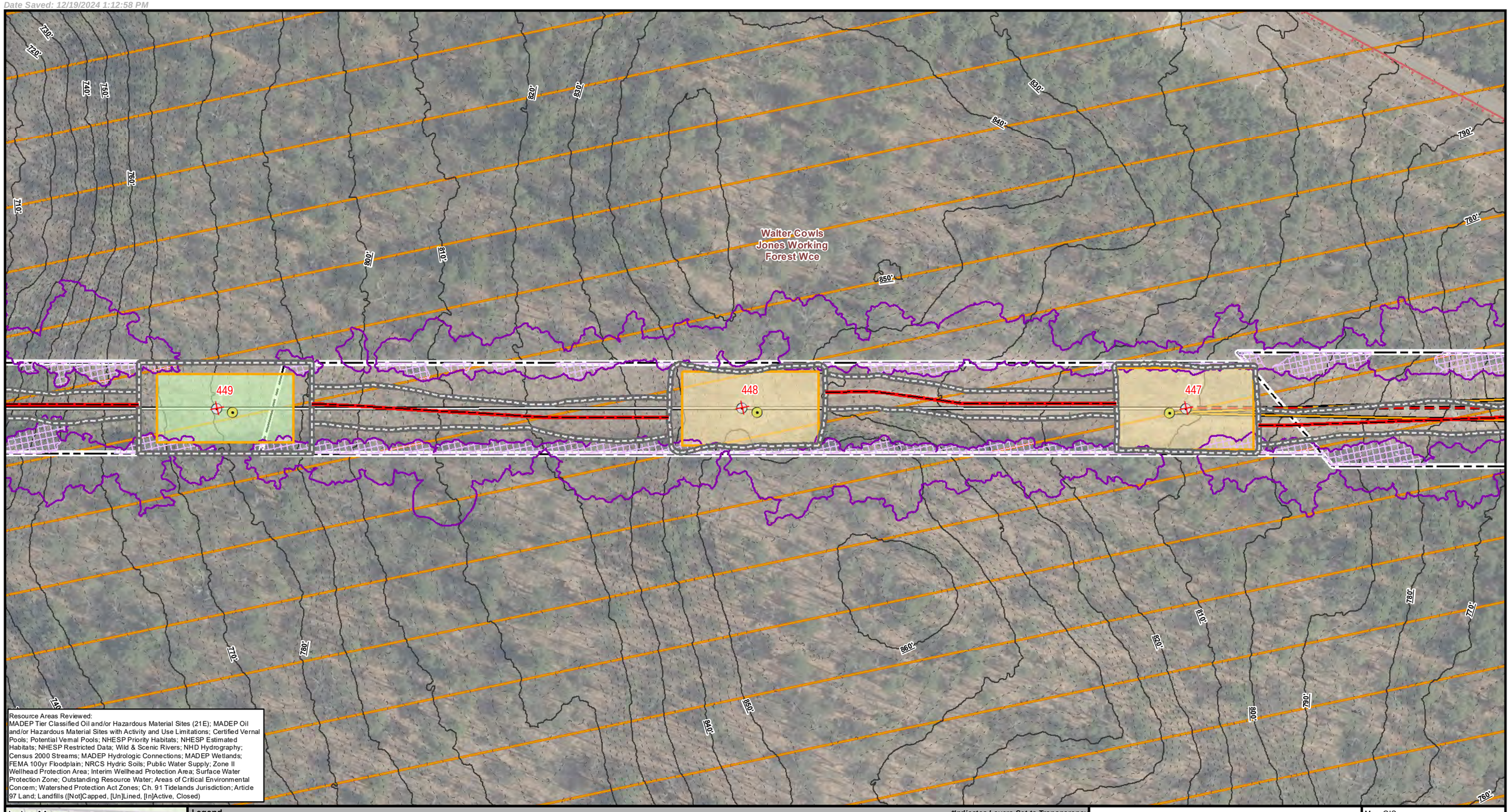

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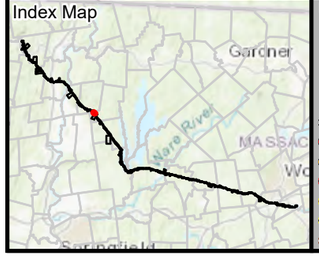

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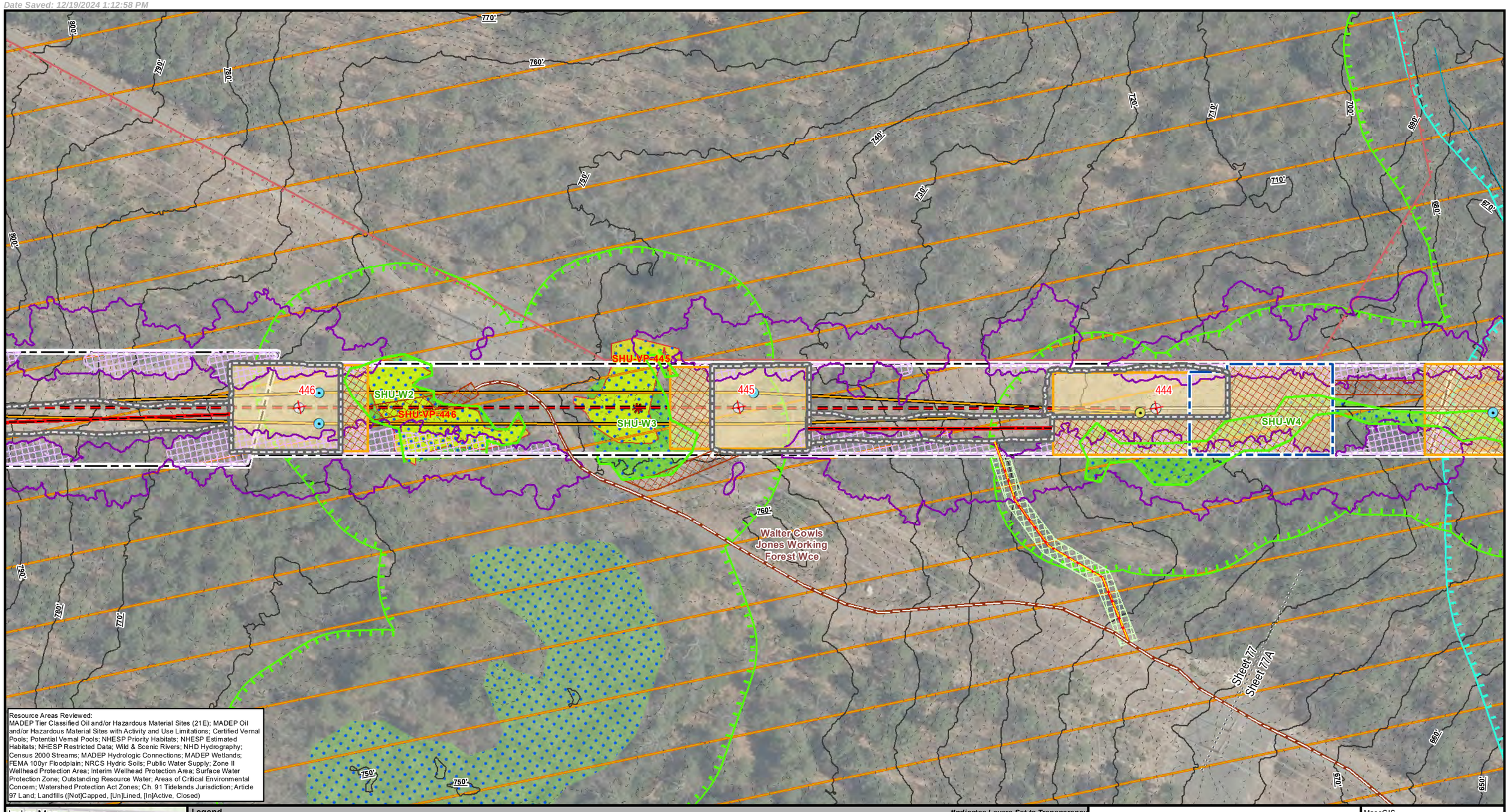

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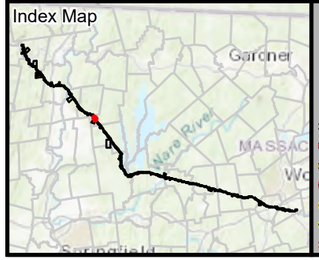

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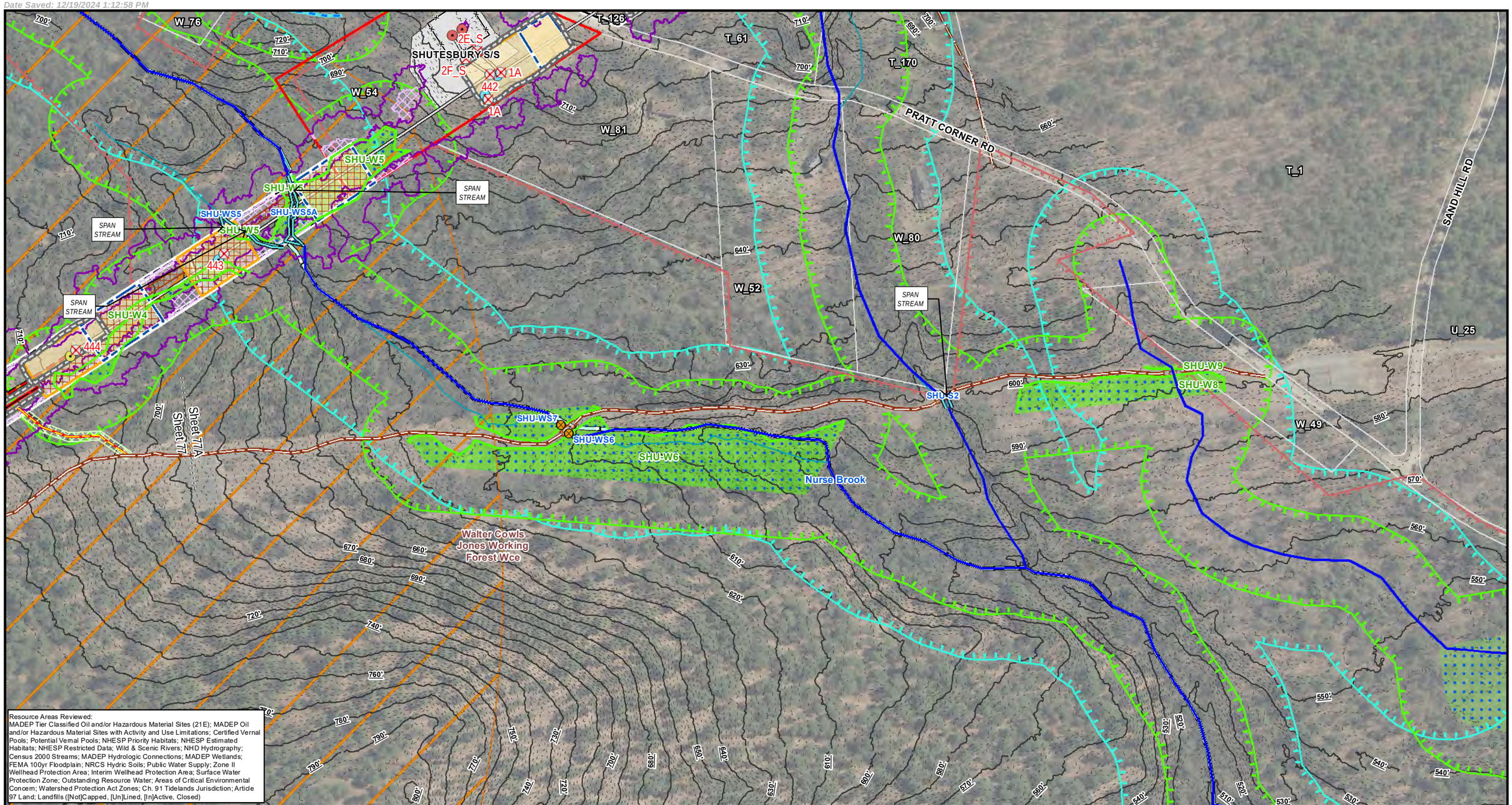

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N

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Environmental Resources Map

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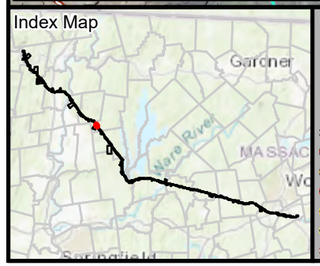

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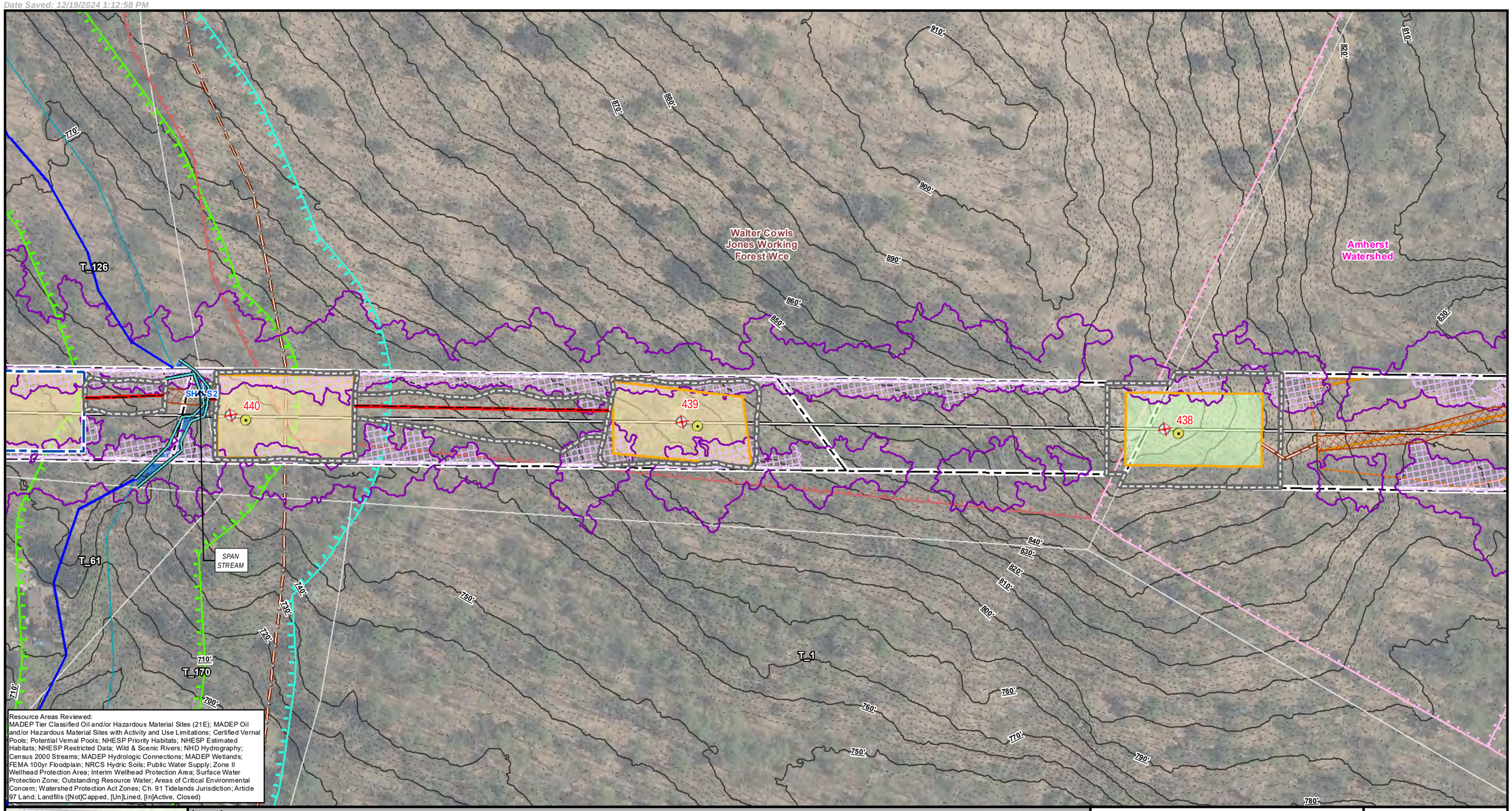

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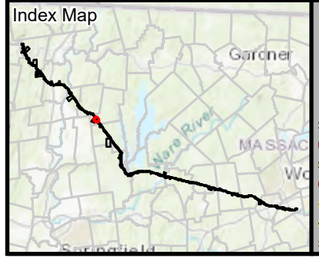

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Walter Cowls Jones Working Forest Wce

SAND HILL RD

Dean Brook

T_6

SHU-WS10

SHU-W10

SHU-S3

SHU-W11

437

436

SPAN STREAM

U_8

Amherst Watershed

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Gardner

Springfield

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- Private

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0 50 100
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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Shutesbury, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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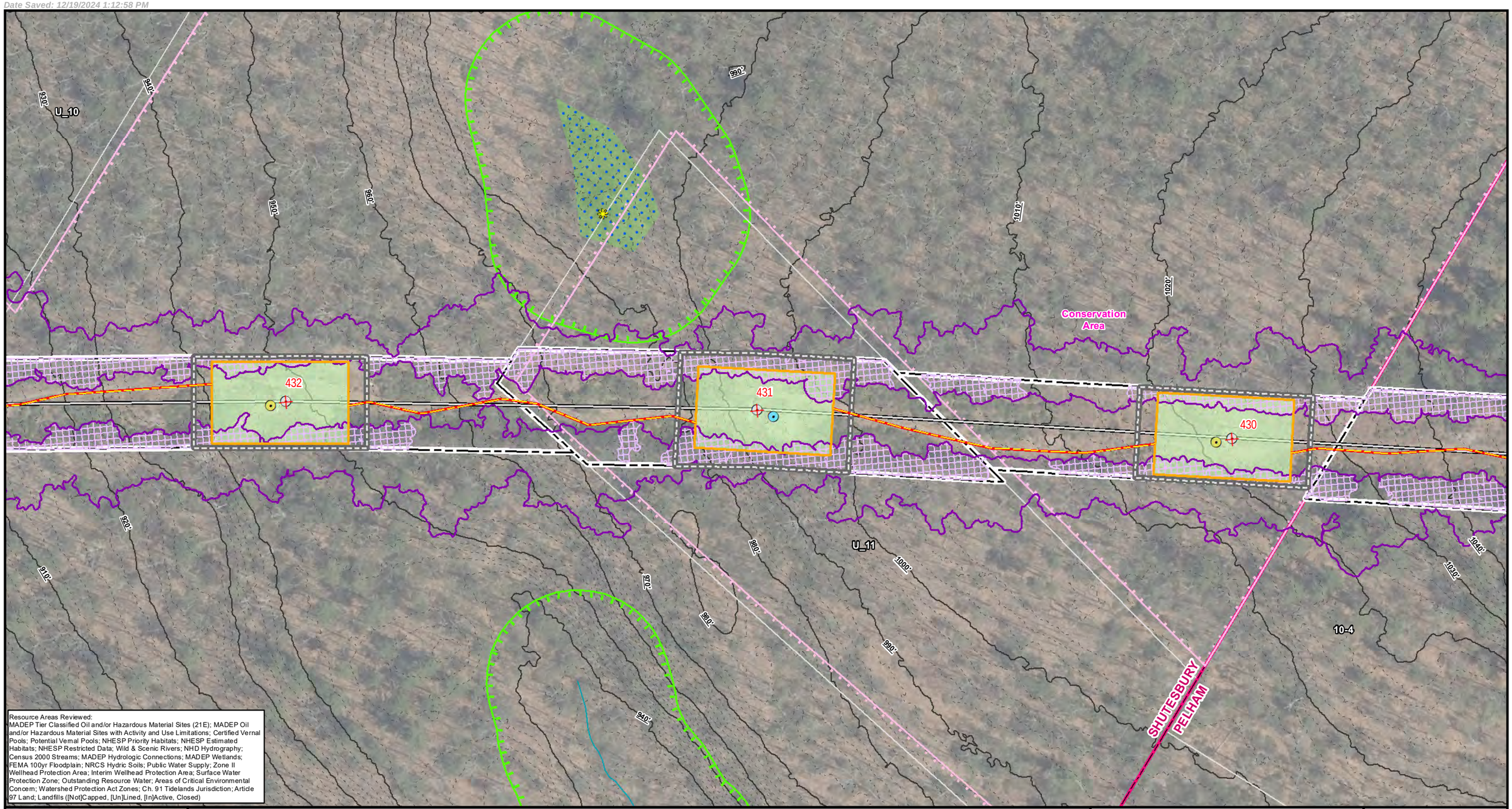

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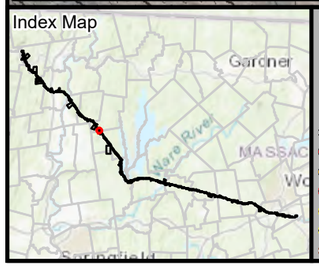

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Conservation Area

SHUTESBURY

PELHAM

10-5-6

10-4

429

428

427

PE-W1

1100'

1080'

1090'

1070'

1060'

1050'

1040'

1030'

1020'

1099'

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Gardner

Springfield

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Environmental Resources Map

Pelham, MA

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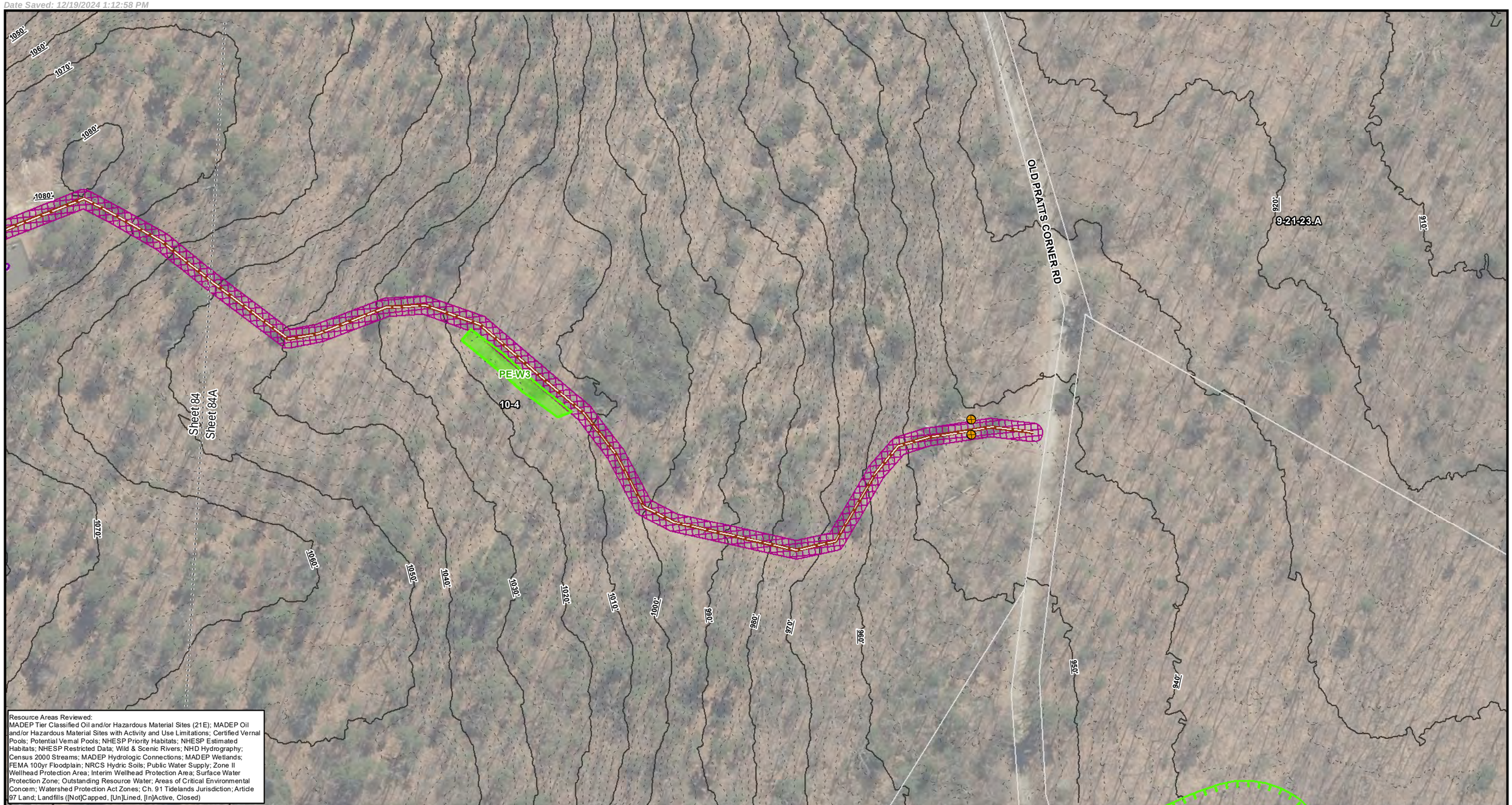

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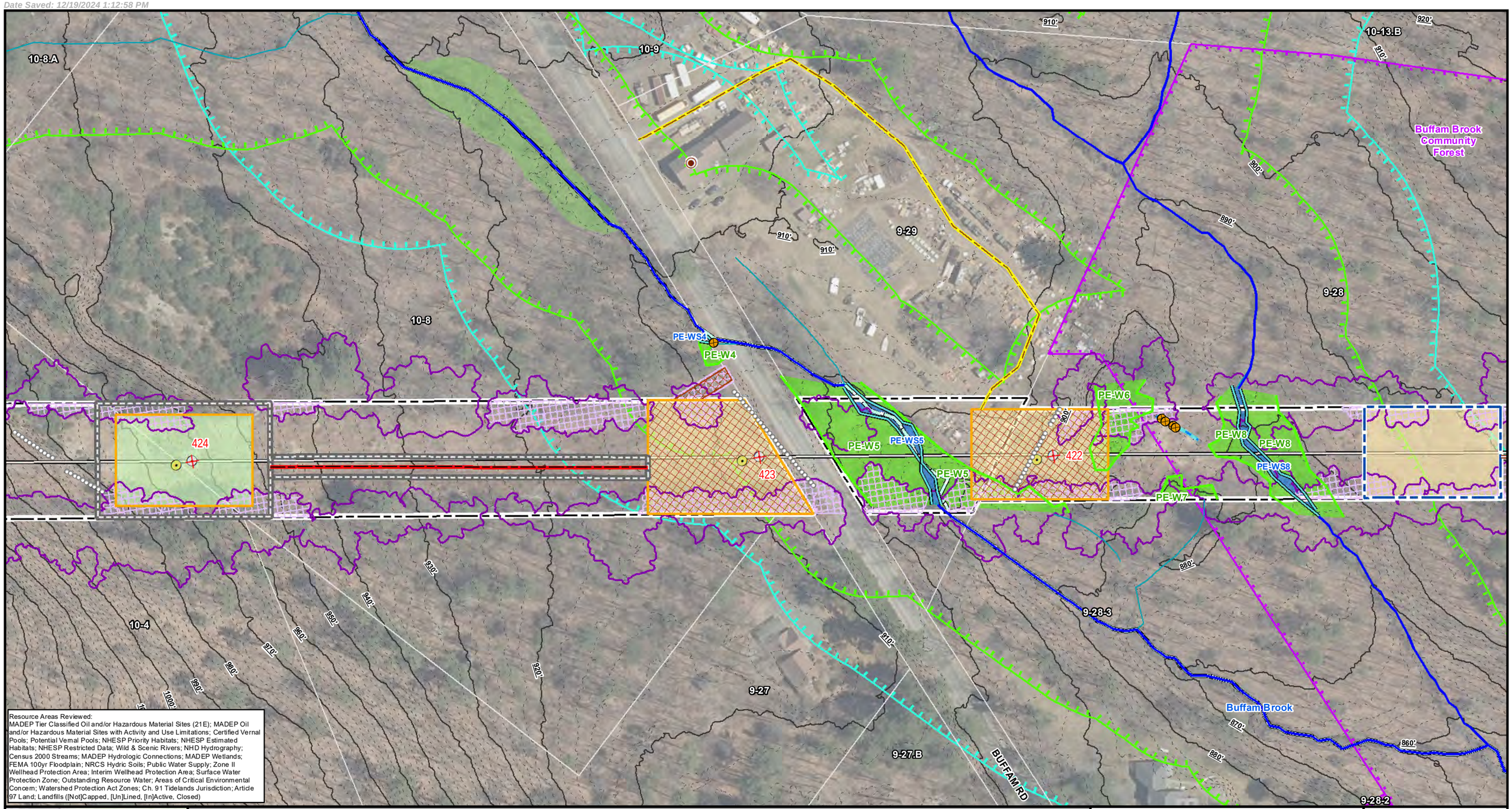

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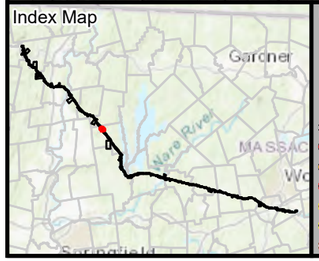

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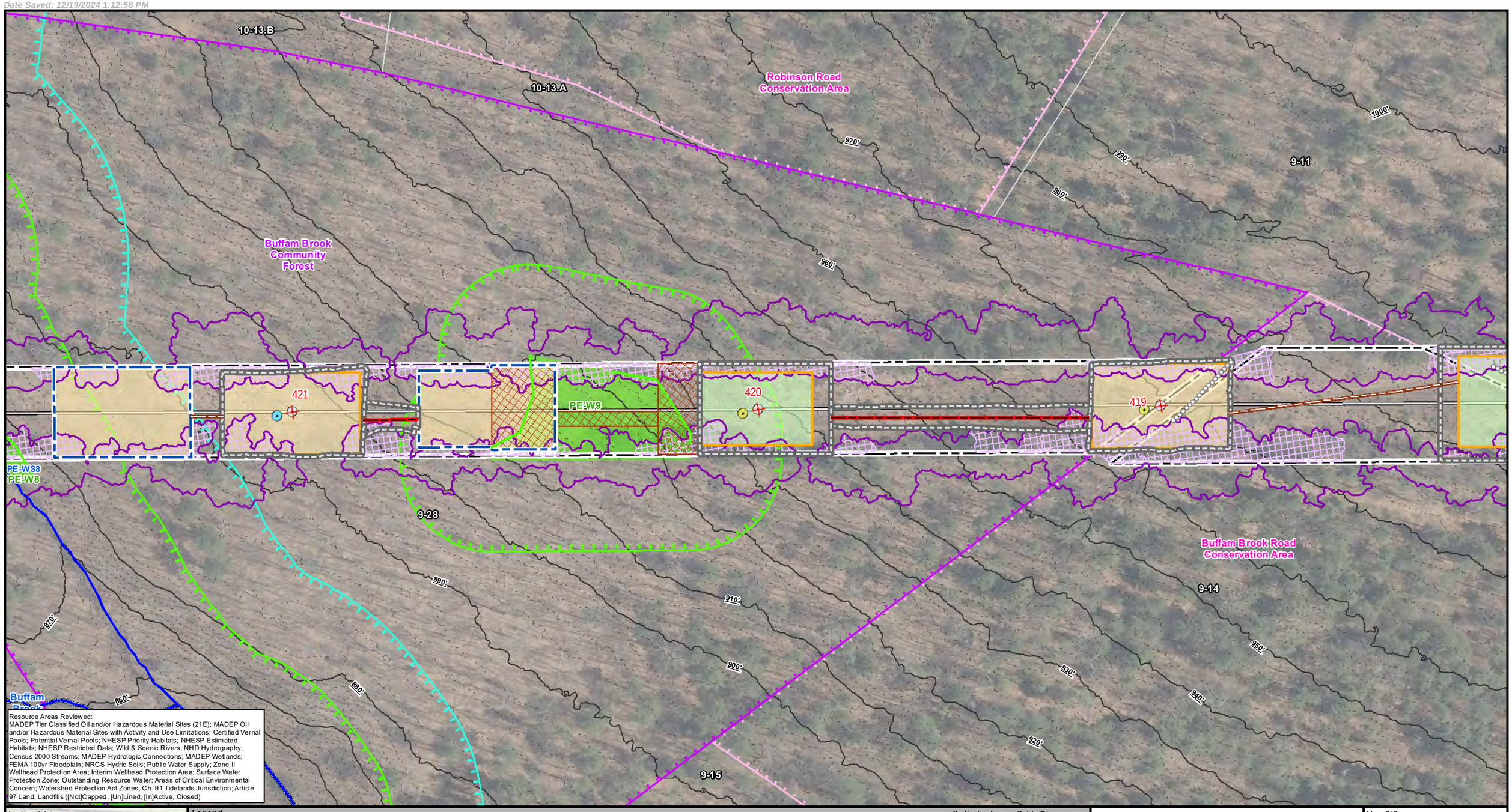

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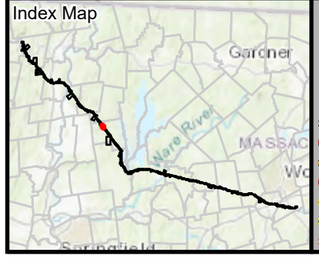

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9-14
9-10
Amherst Water Supply Land
Buffam Brook Community Forest
Buffam Brook Road Conservation Area
PE-W10
PE-W11
416
417
418
1000'
990'
980'
970'
960'
950'

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- Town Boundary
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Article 97 Lands

- Municipal
- Land Trust

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Pelham, MA

MassGIS
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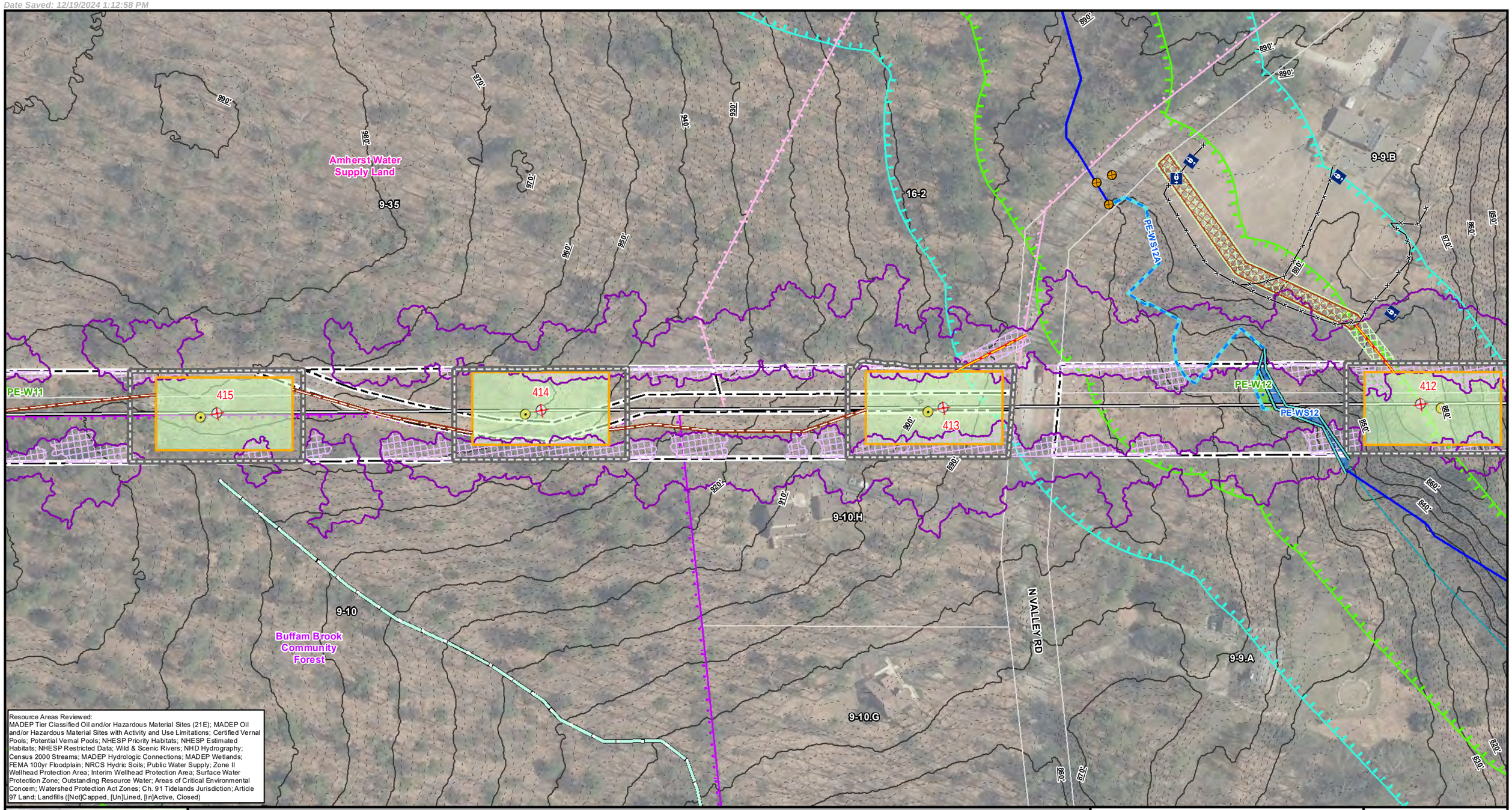

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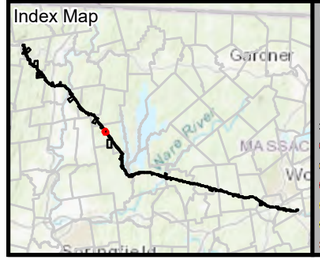

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Article 97 Lands

- Municipal

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Environmental Resources Map

Pelham, MA

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Amherst Water Supply Land
16-1
16-2
16-1
BREWER RD
N VALLEY RD
NEW ENGLAND TRAIL
970'
960'
950'
940'
930'
920'
910'
900'
890'
880'
870'
860'
850'
840'
830'
820'
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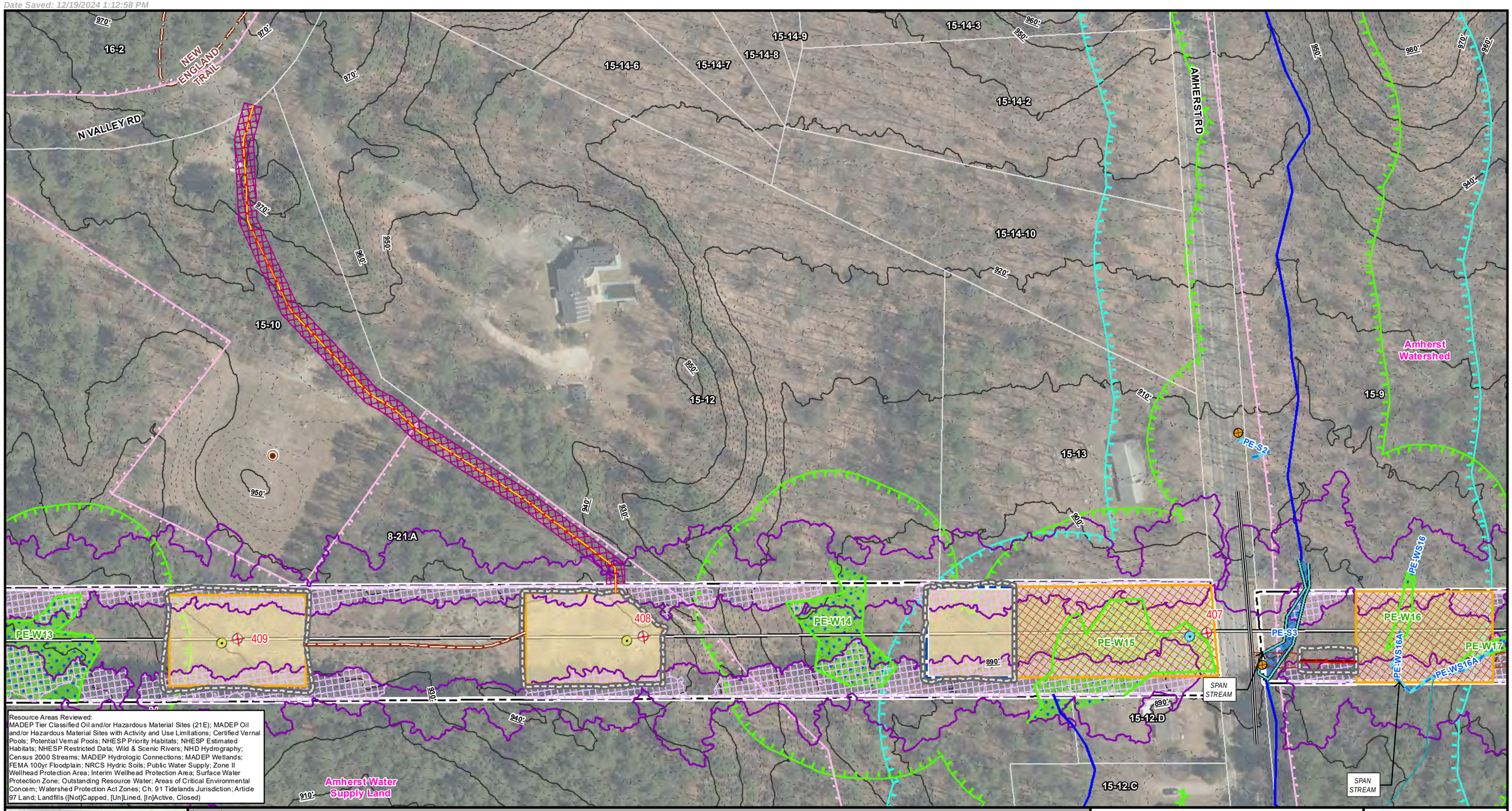

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Amherst Watershed

Dunlop Brook

SPAN STREAM

SPAN STREAM

PE-S3

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PE-WS16

PE-WS16A

PE-W17

PE-WS17

PE-WS16A

406

PE-W18

PE-WS18

PE-WS18A

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405

PE-W19

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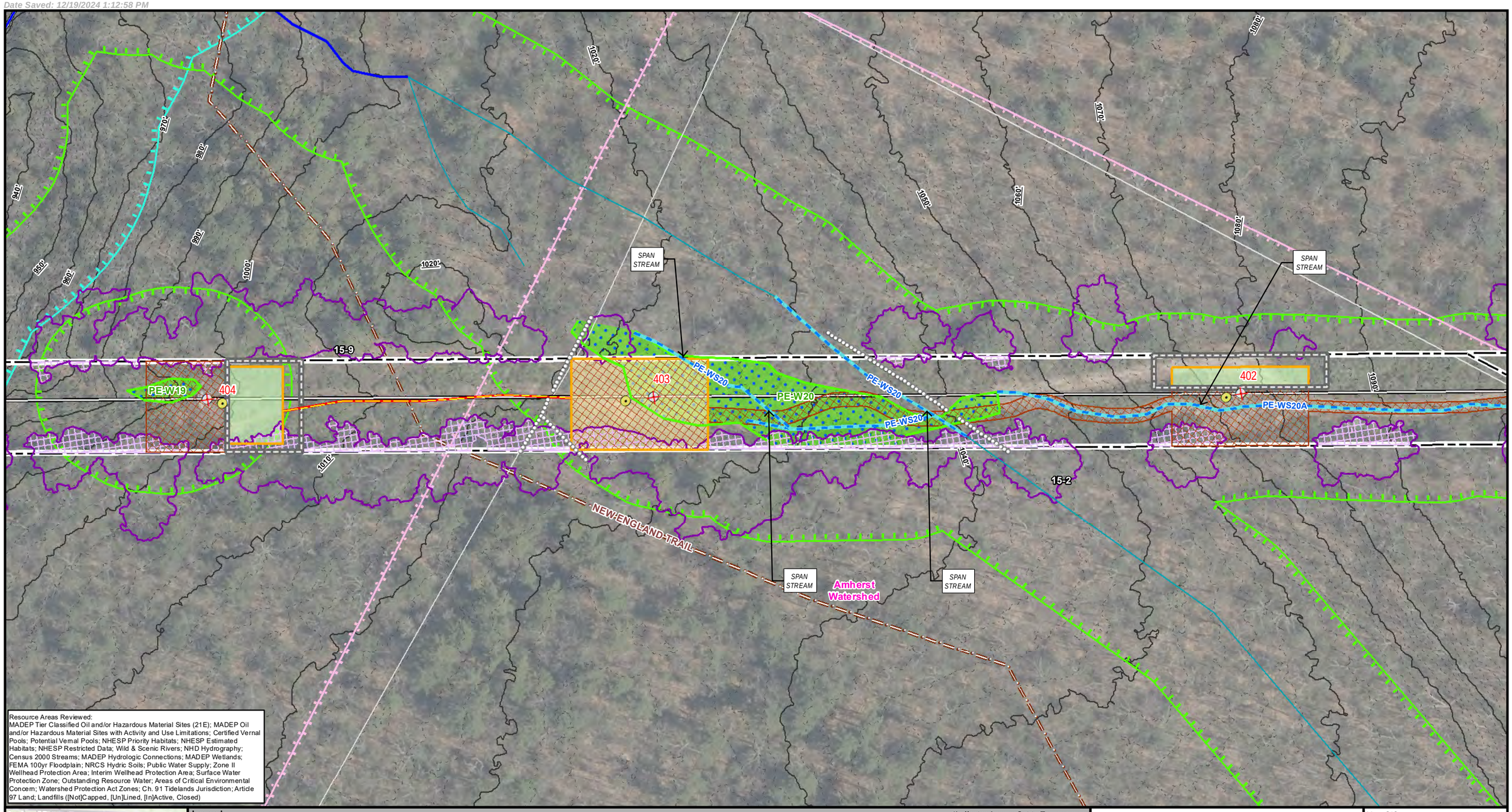

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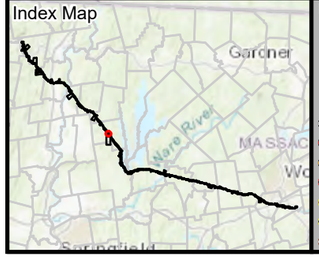

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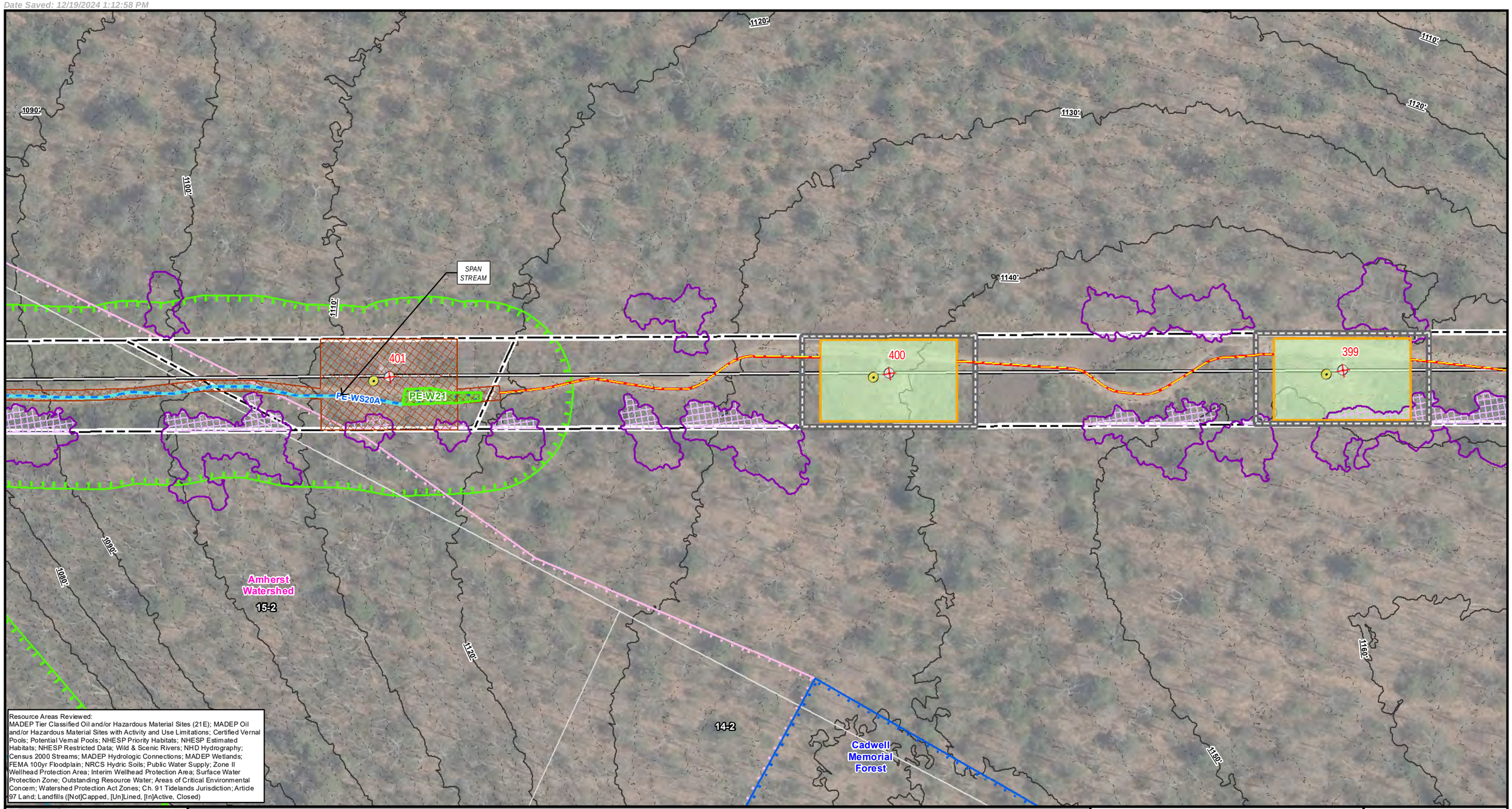

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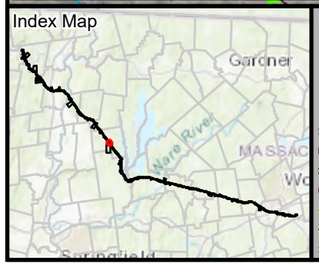

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- Selective Tree Removal
- Pruning
- Town Boundary
- Parcel Boundaries

Article 97 Lands

- Commonwealth of Massachusetts
- Municipal

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Pelham, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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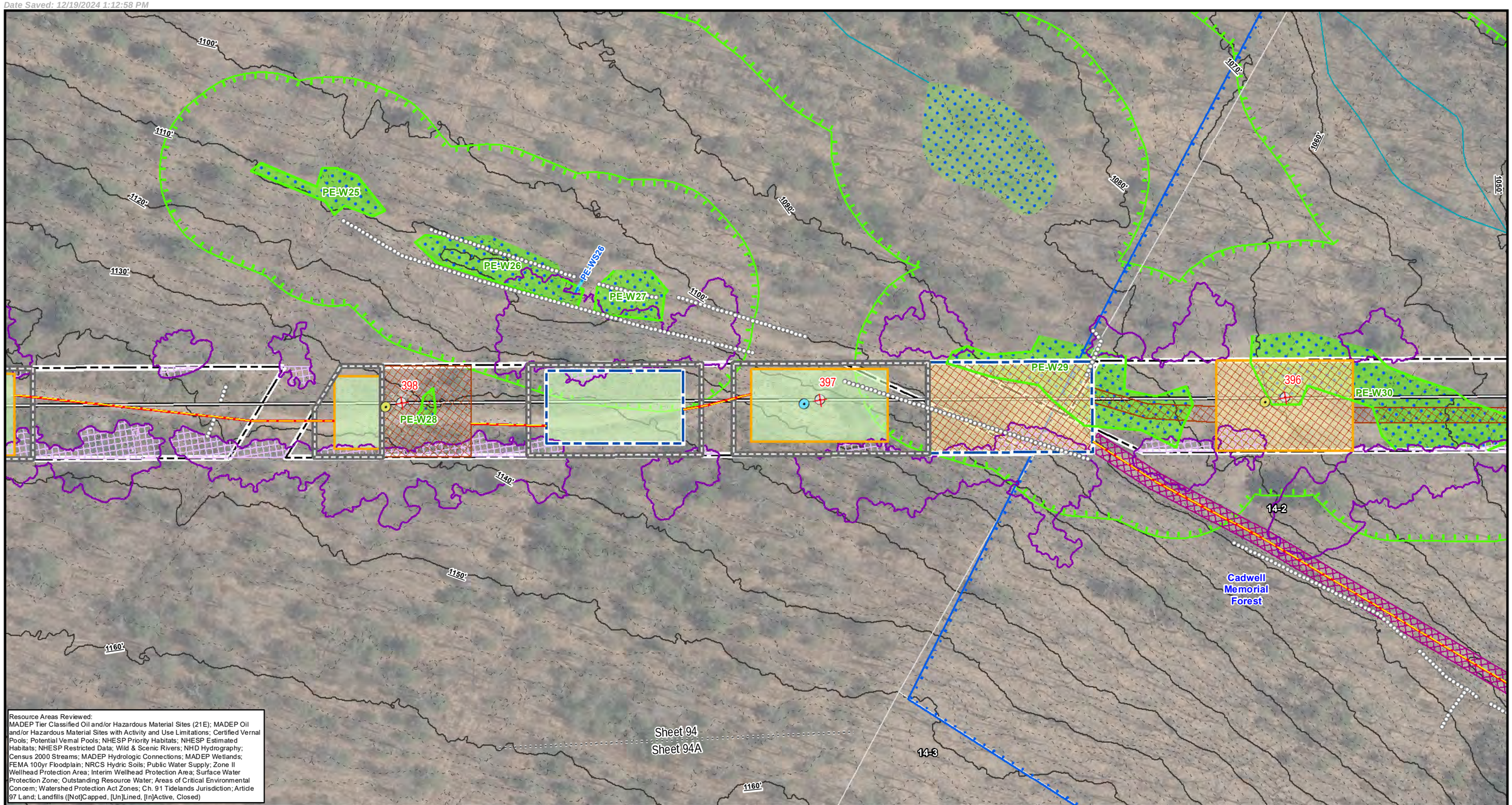

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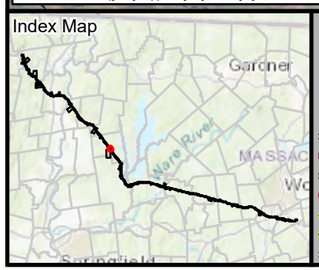

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Article 97 Lands

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1 inch = 100 feet
0 50 100
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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Pelham, MA

MassGIS
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PE-W31
PE-W30
PE-W43
PE-W41
PE-S4
SPAN STREAM
SPAN STREAM
SPAN STREAM
Jabish Brook
Cadwell Memorial Forest
Meads Corner Conservation Area
GULF RD
GOLD ST
PACKARDVILLE RD
NEW ENGLAND TRAIL
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Article 97 Lands

- Commonwealth of Massachusetts
- Municipal

1 inch = 500 feet
0 260 520
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Belchertown & Pelham, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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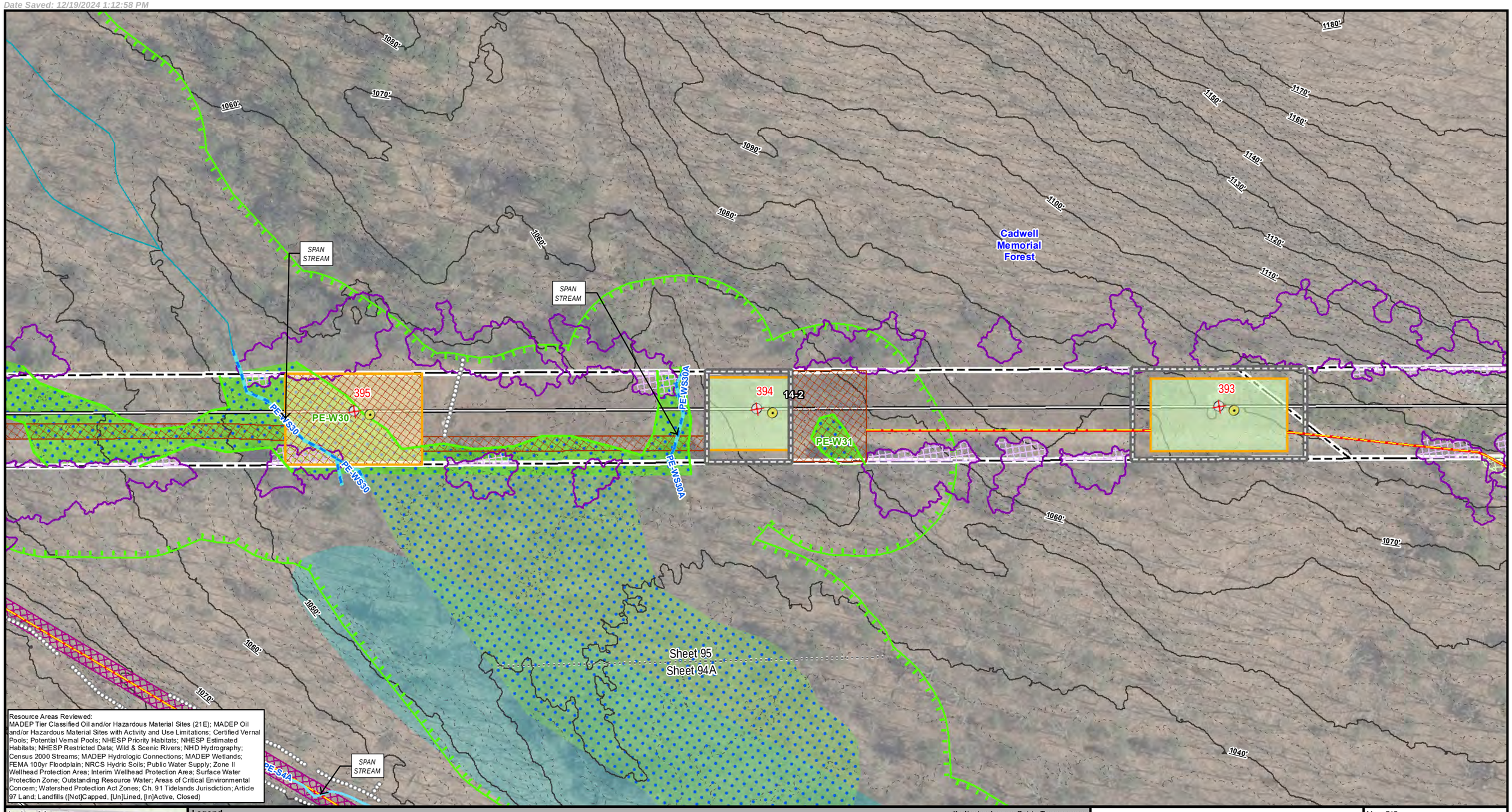

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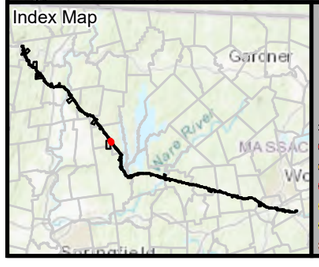

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Pelham, MA

MassGIS
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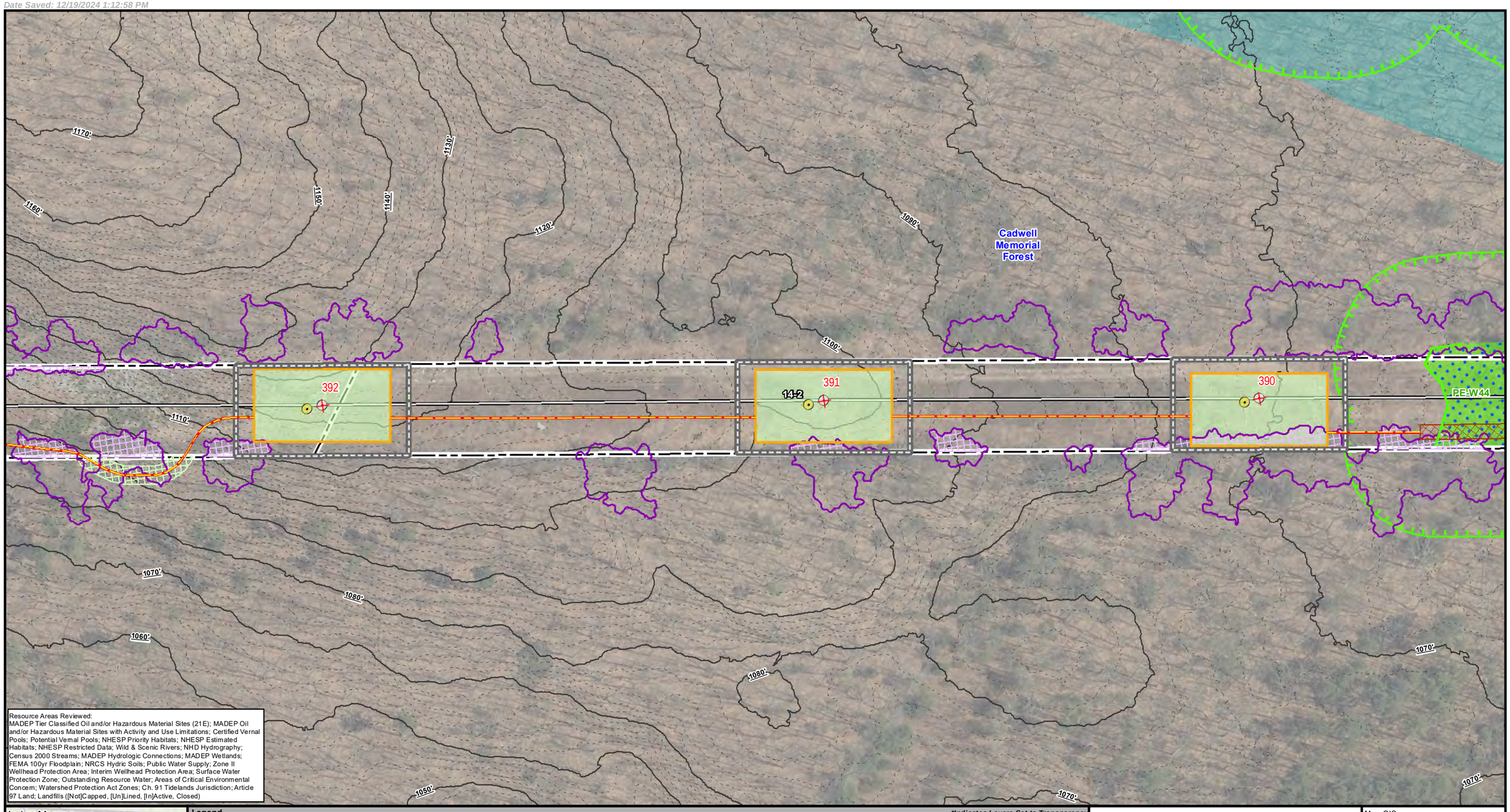

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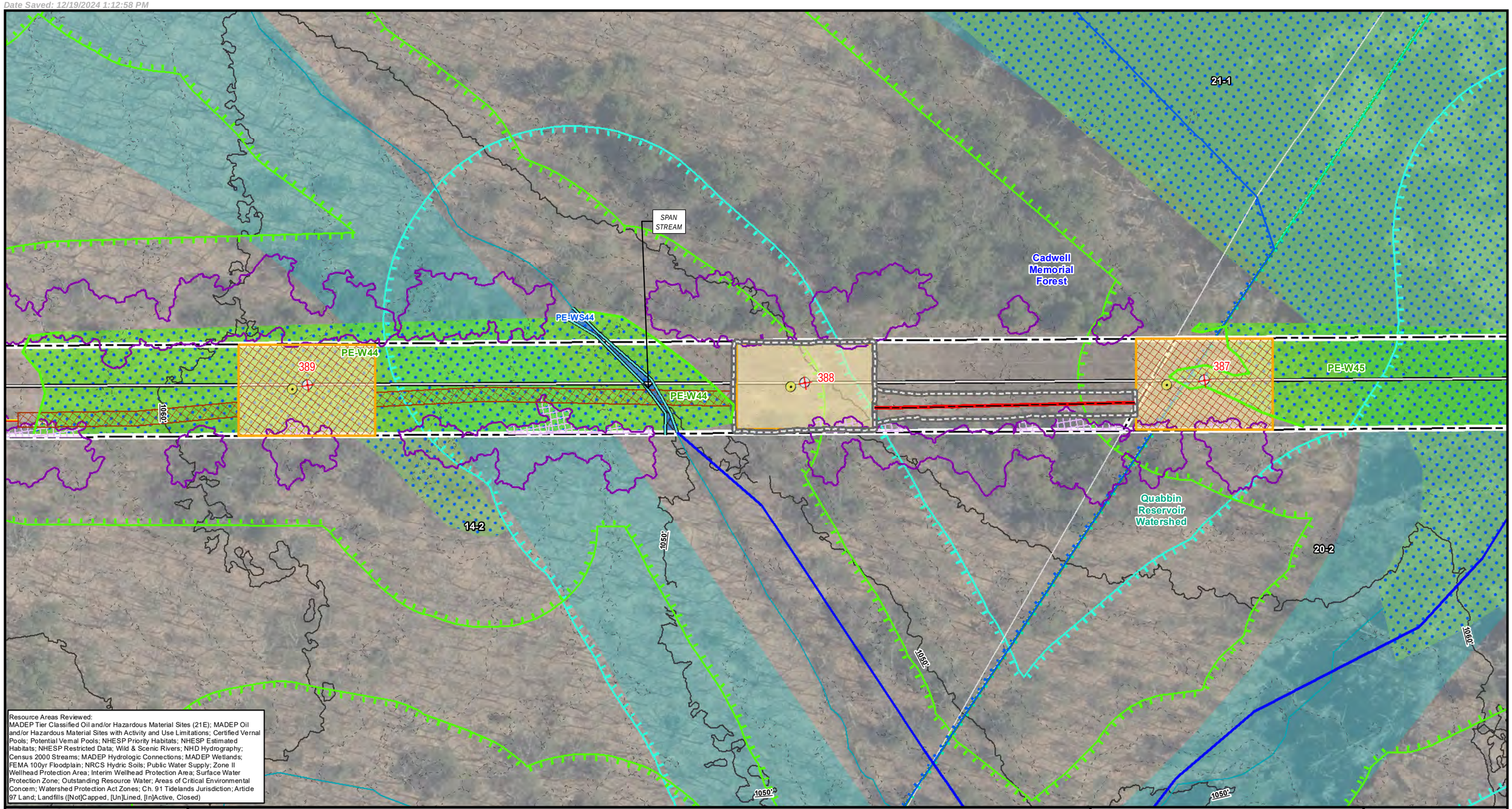

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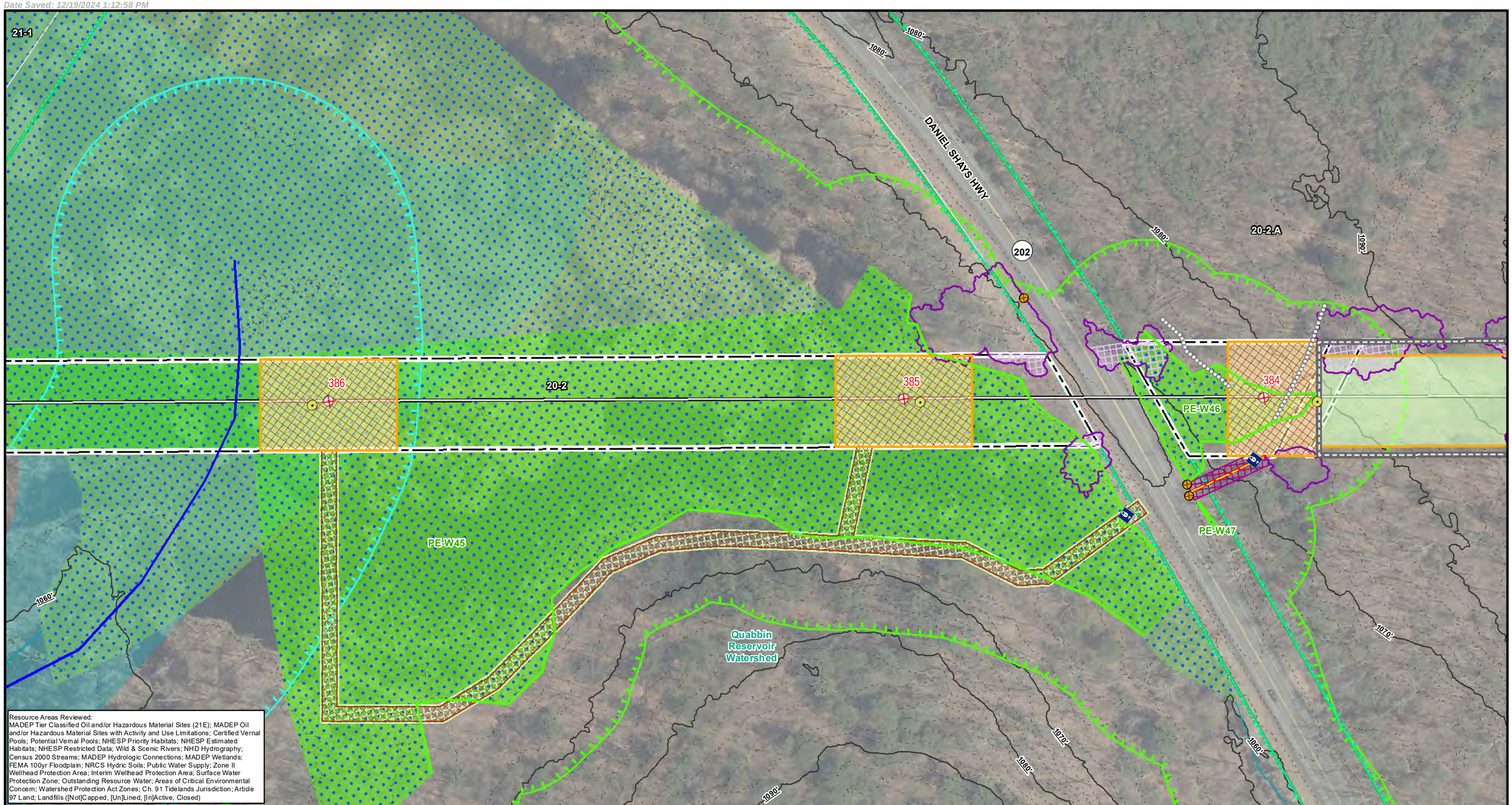

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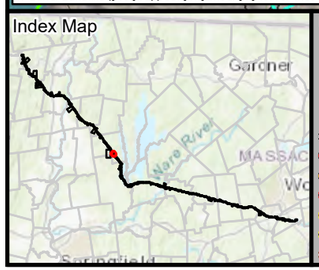

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- DCR-Water Supply Protection

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Pelham, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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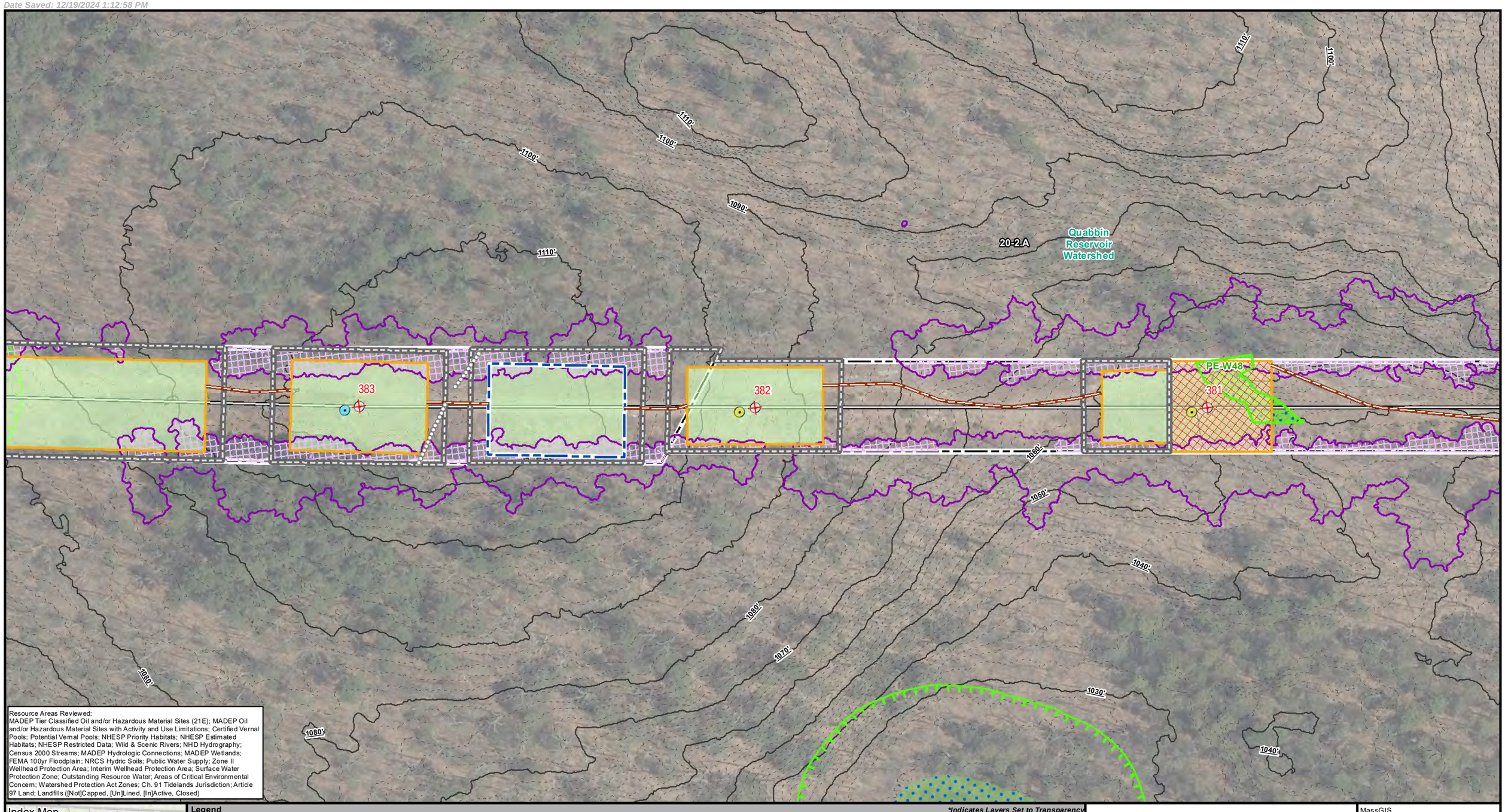

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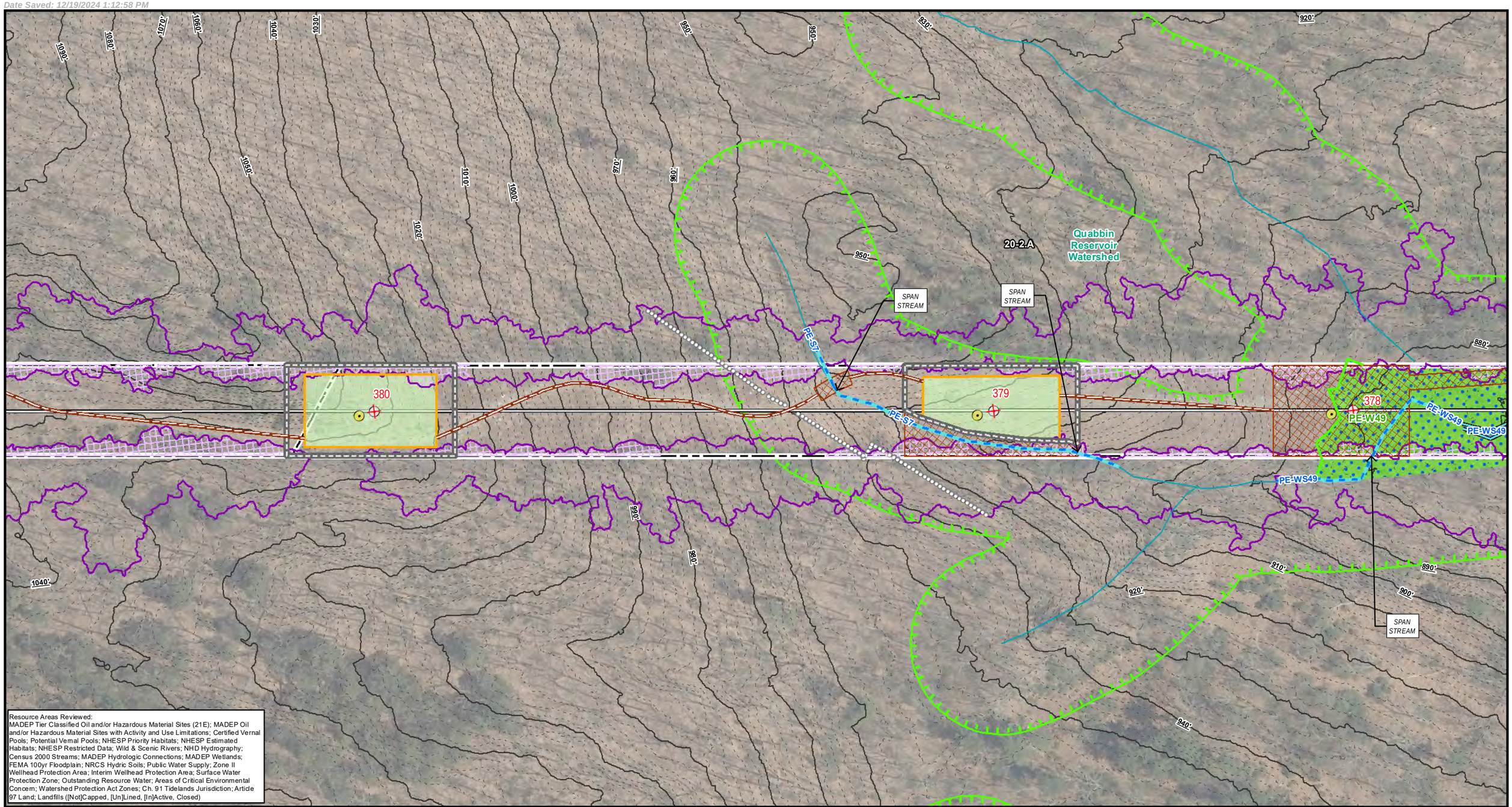

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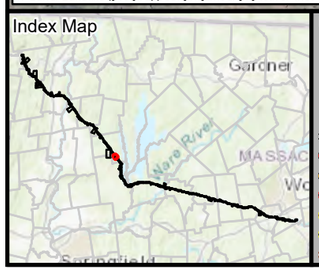

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Cadwell Creek

SPAN STREAM

SPAN STREAM

SPAN STREAM

20-2.A

Quabbin Reservoir Watershed

377

376

375

PE-W49

PE-WS49

PE-WS49C

910'

900'

890'

880'

870'

860'

840'

820'

810'

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Gardner

Springfield

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Environmental Resources Map

Pelham, MA

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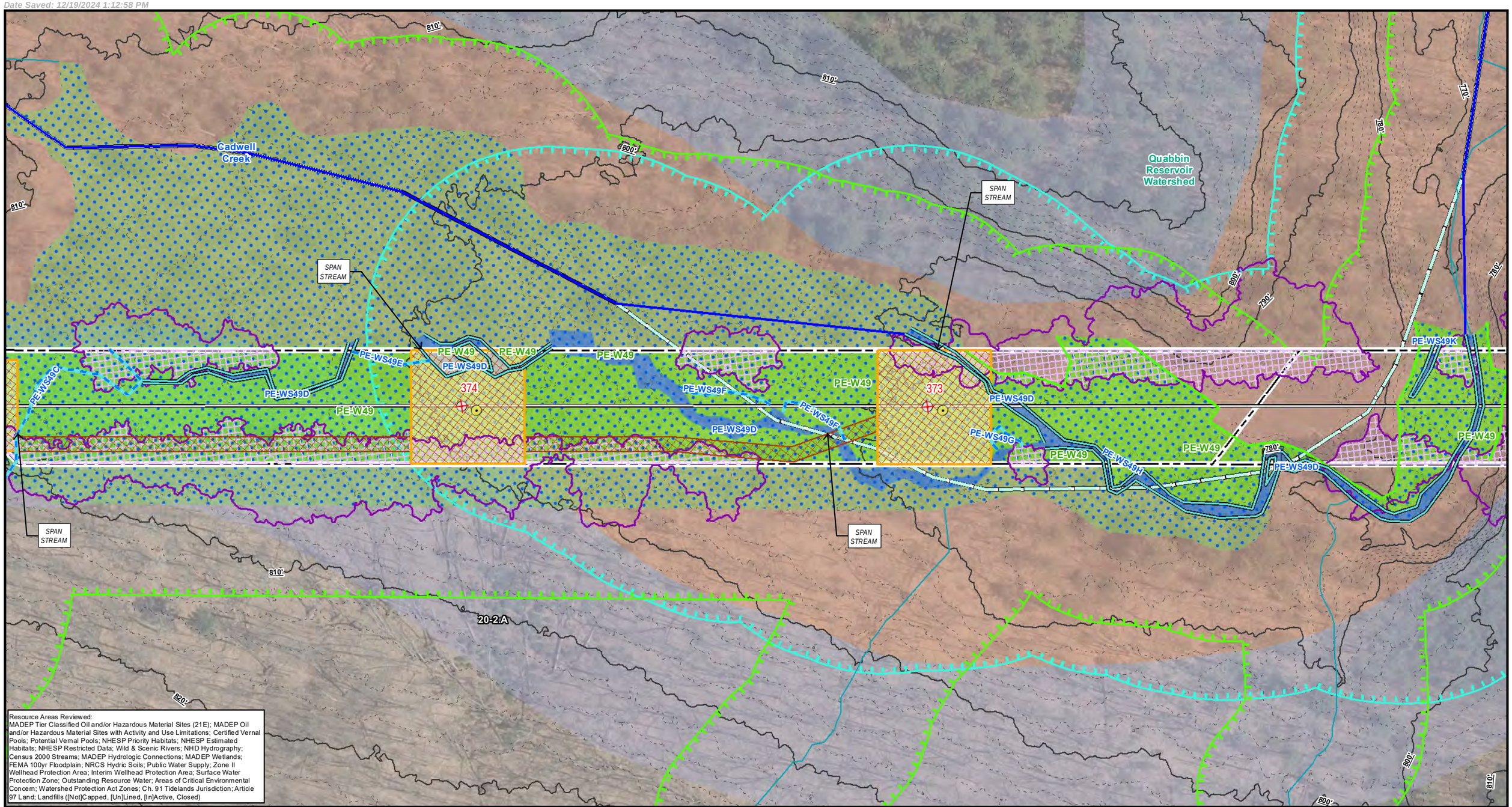

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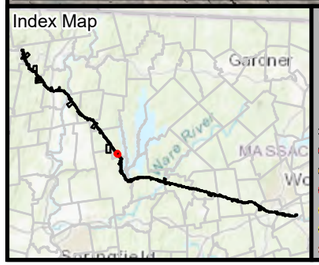

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Cadwell Creek
JUCKETT HILL RD
Quabbin Reservoir Watershed
20-2.A
PE-W51
PE-WS51
PE-WS49K
PE-W49
PE-WS49D
372
371
370
PE-WS50
PE-W50
PE-W52
PE-WS52
PE-WS52B
PE-WS52A
PE-W53
SPAN STREAM
SPAN STREAM
PACKARDVILLE RD
770'
780'
790'
800'
810'
820'
840'
850'

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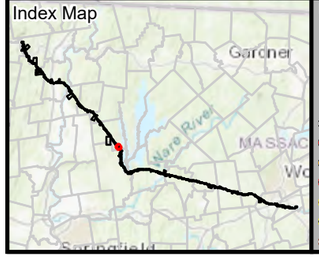

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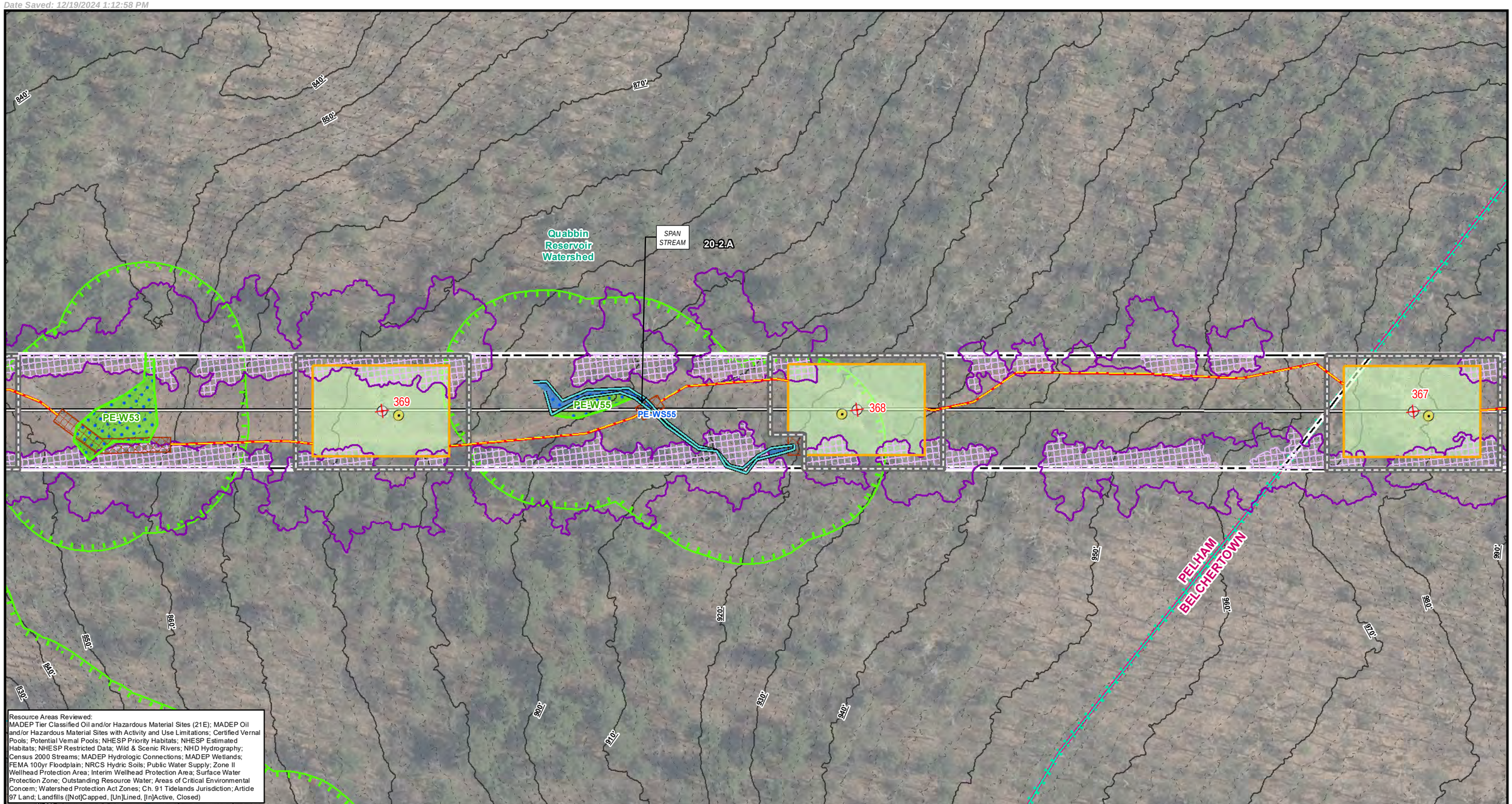

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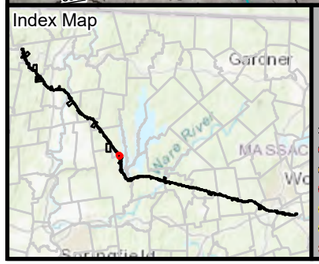

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20-2.A

PELHAM
BELCHERTOWN

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Quabbin Reservoir Watershed

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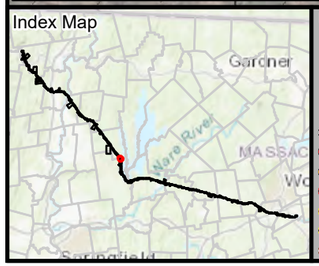

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- Guardrail
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- Existing Treeline
- Tree Removal
- Selective Tree Removal
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Indicates Layers Set to Transparency

- Town Boundary
- Parcel Boundaries

Article 97 Lands

- DCR-Water Supply Protection

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Pelham & Belchertown, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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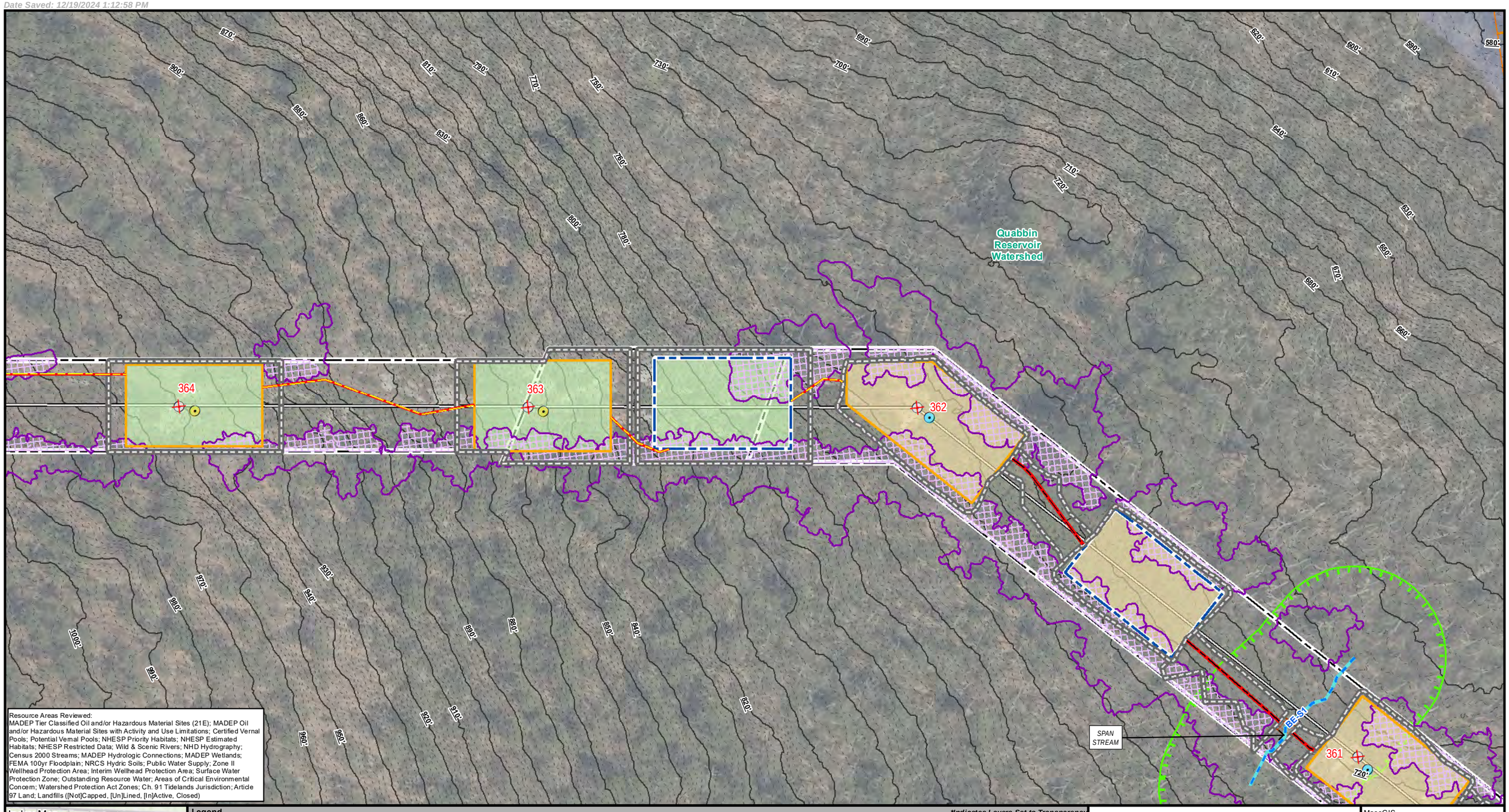

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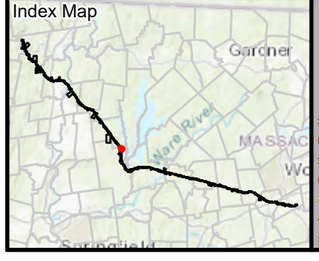

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Belchertown, MA

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Quabbin Reservoir Watershed

SPAN STREAM

SPAN STREAM

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BE-S1

BE-W1

BE-WS1

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Index Map

Gardner

Springfield

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Article 97 Lands

- DCR-Water Supply Protection

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1 inch = 100 feet

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Belchertown, MA

MassGIS
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Quabbin Reservoir Watershed

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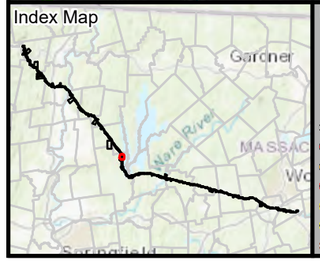

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

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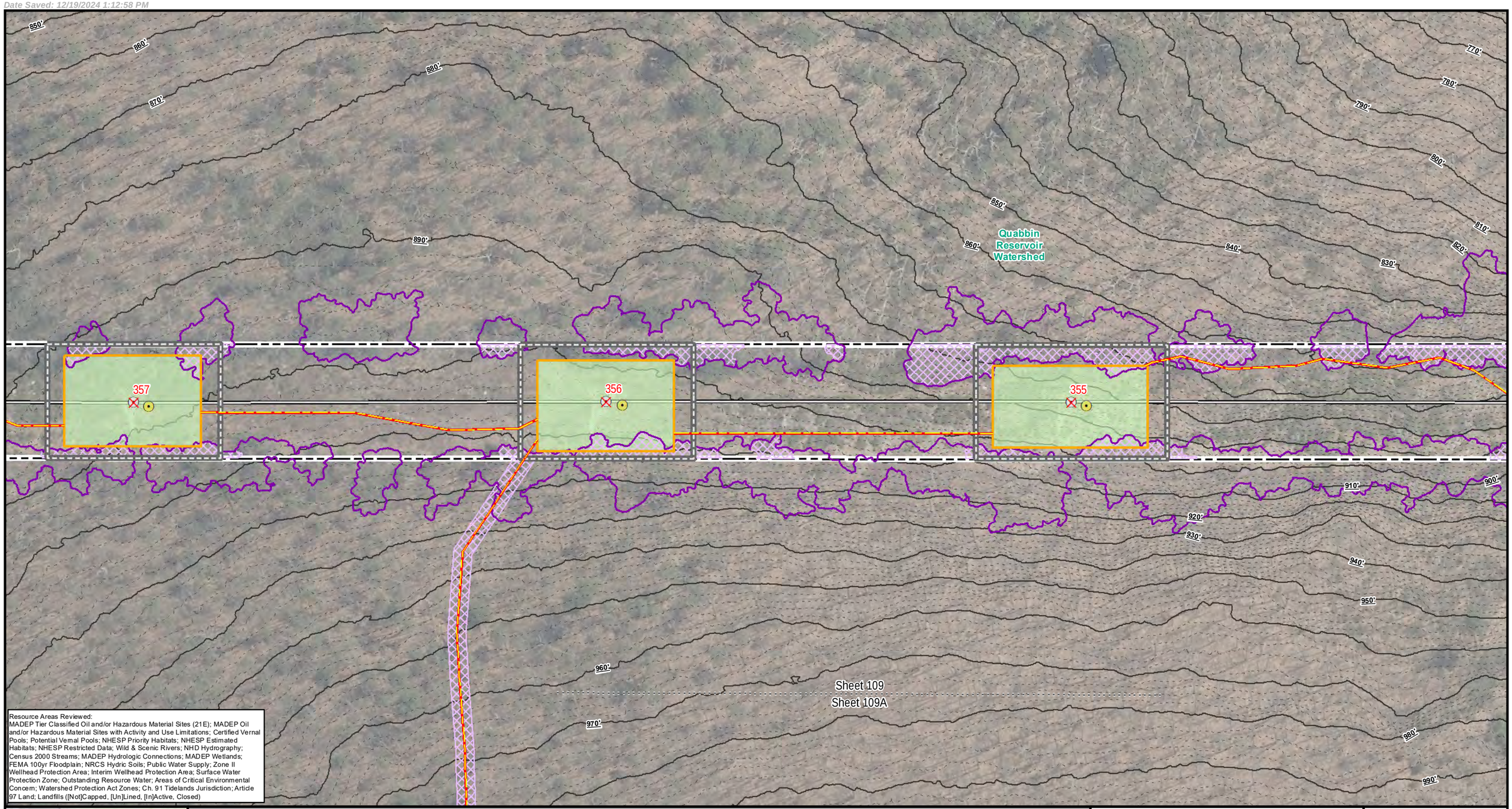

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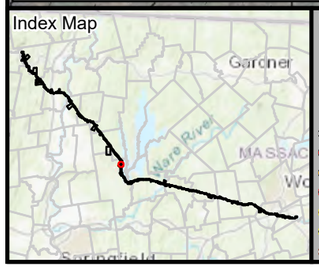

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Belchertown, MA

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Sheet 109

Sheet 109A

Quabbin Reservoir Watershed

BE-W3

BE-W4

JUCKETT RD

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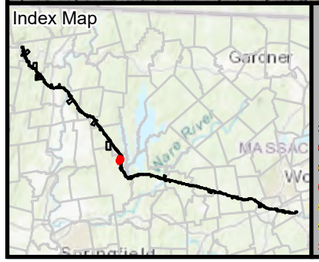

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Feet

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Environmental Resources Map

Belchertown, MA
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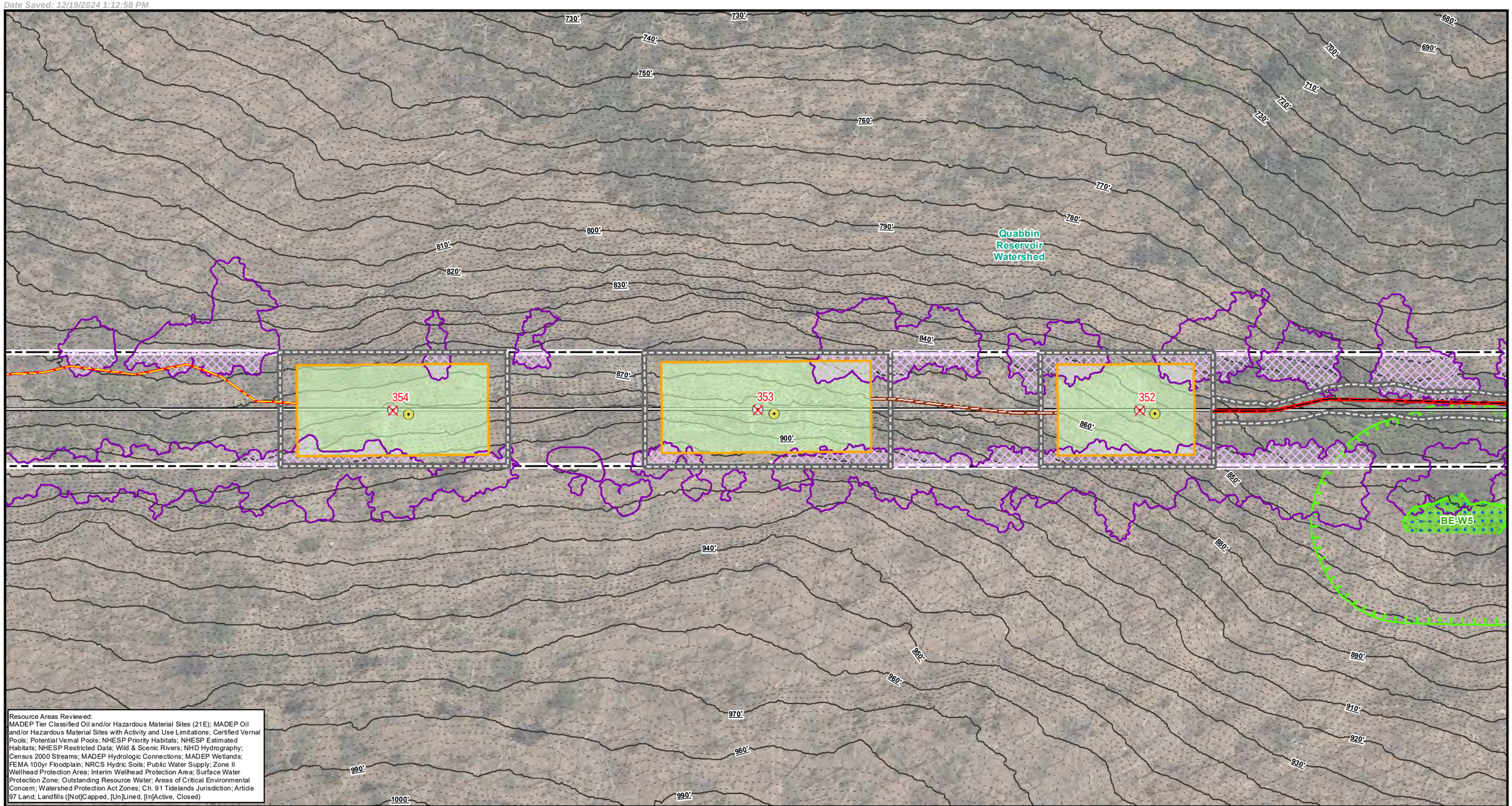

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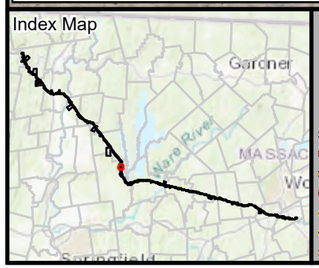

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Belchertown, MA
Page 110 of 240

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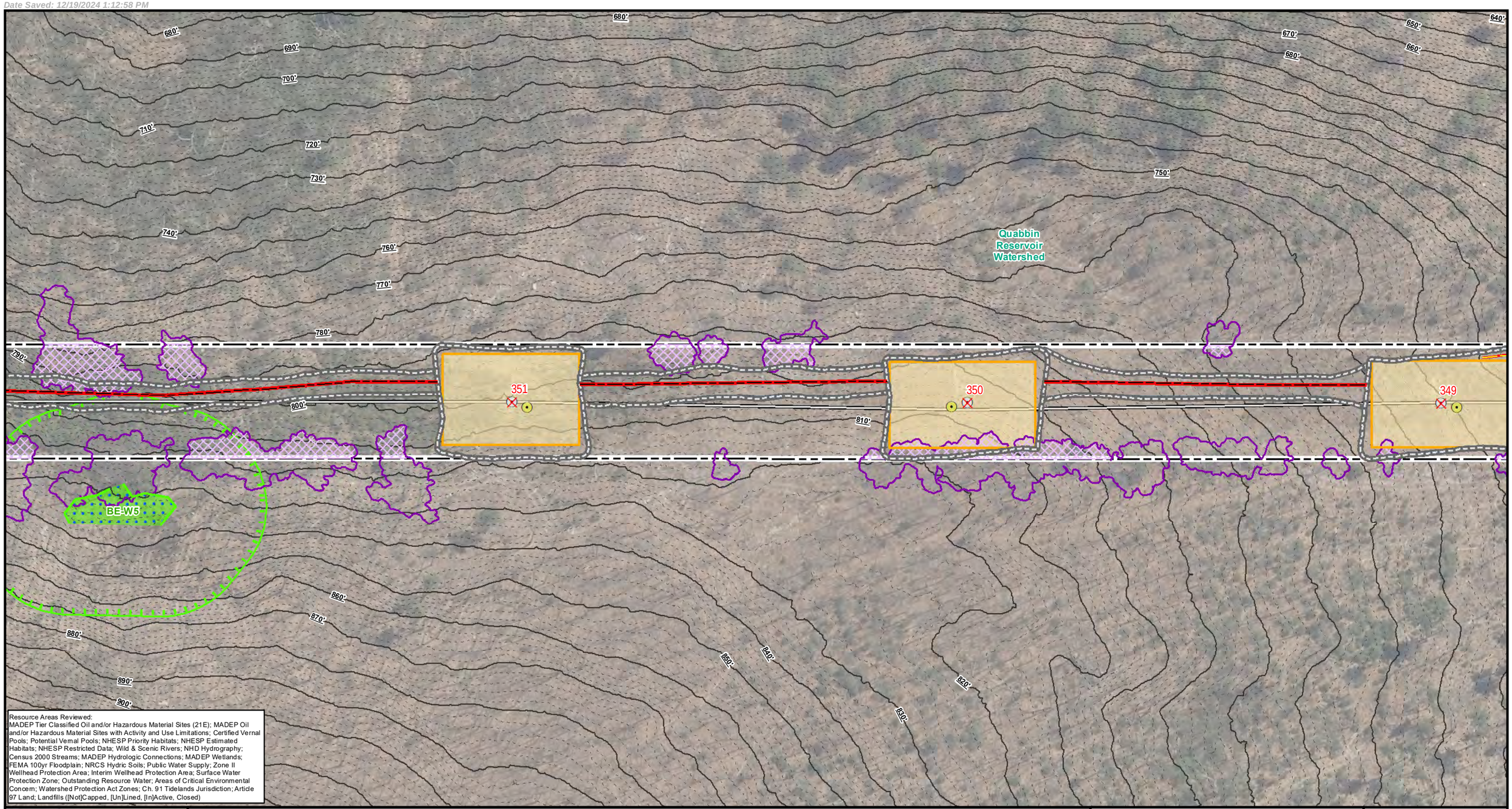

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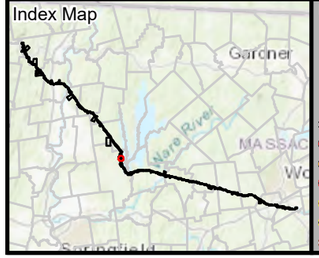

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Article 97 Lands

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1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Belchertown, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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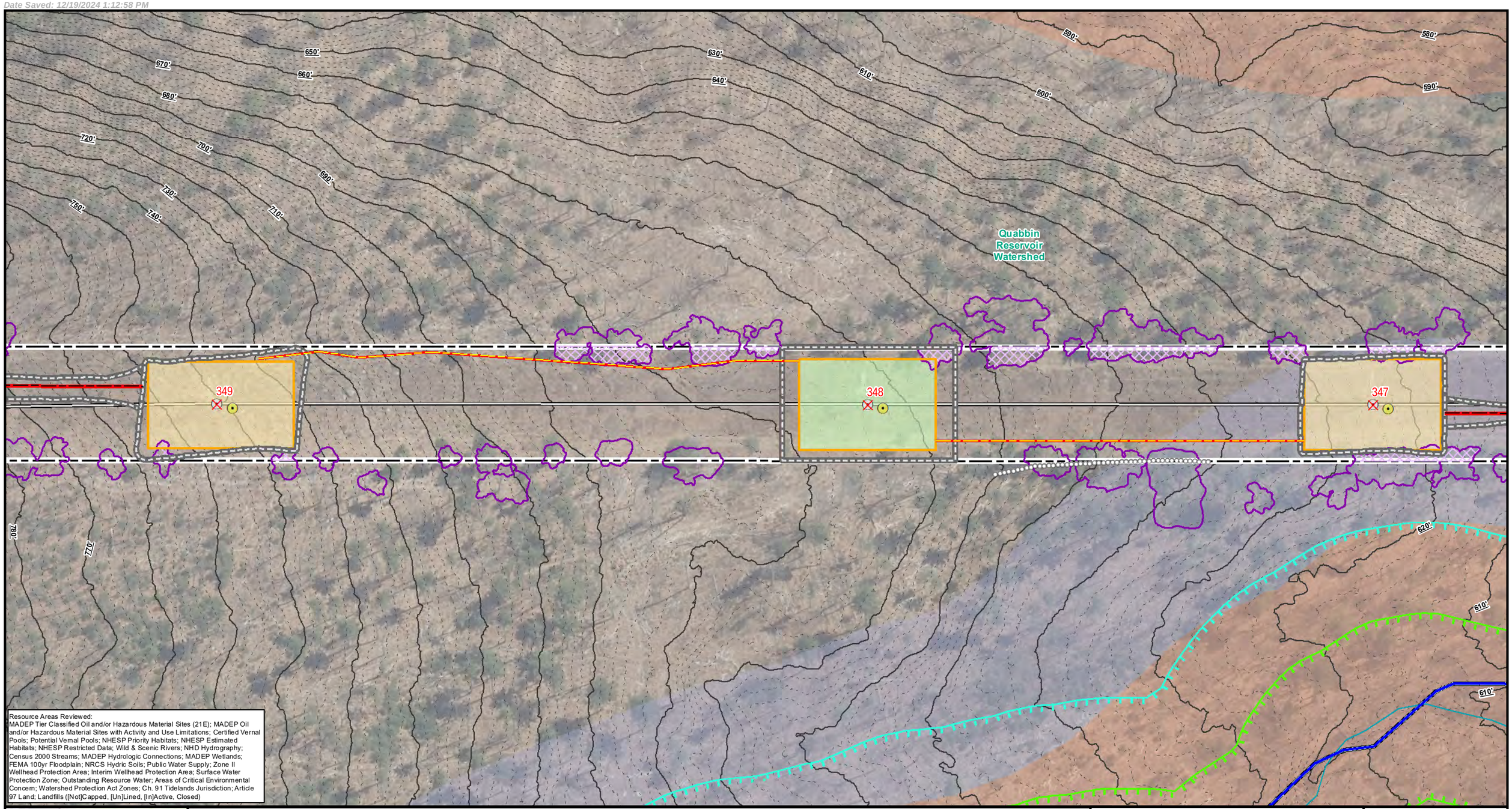

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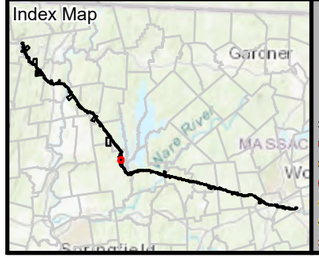

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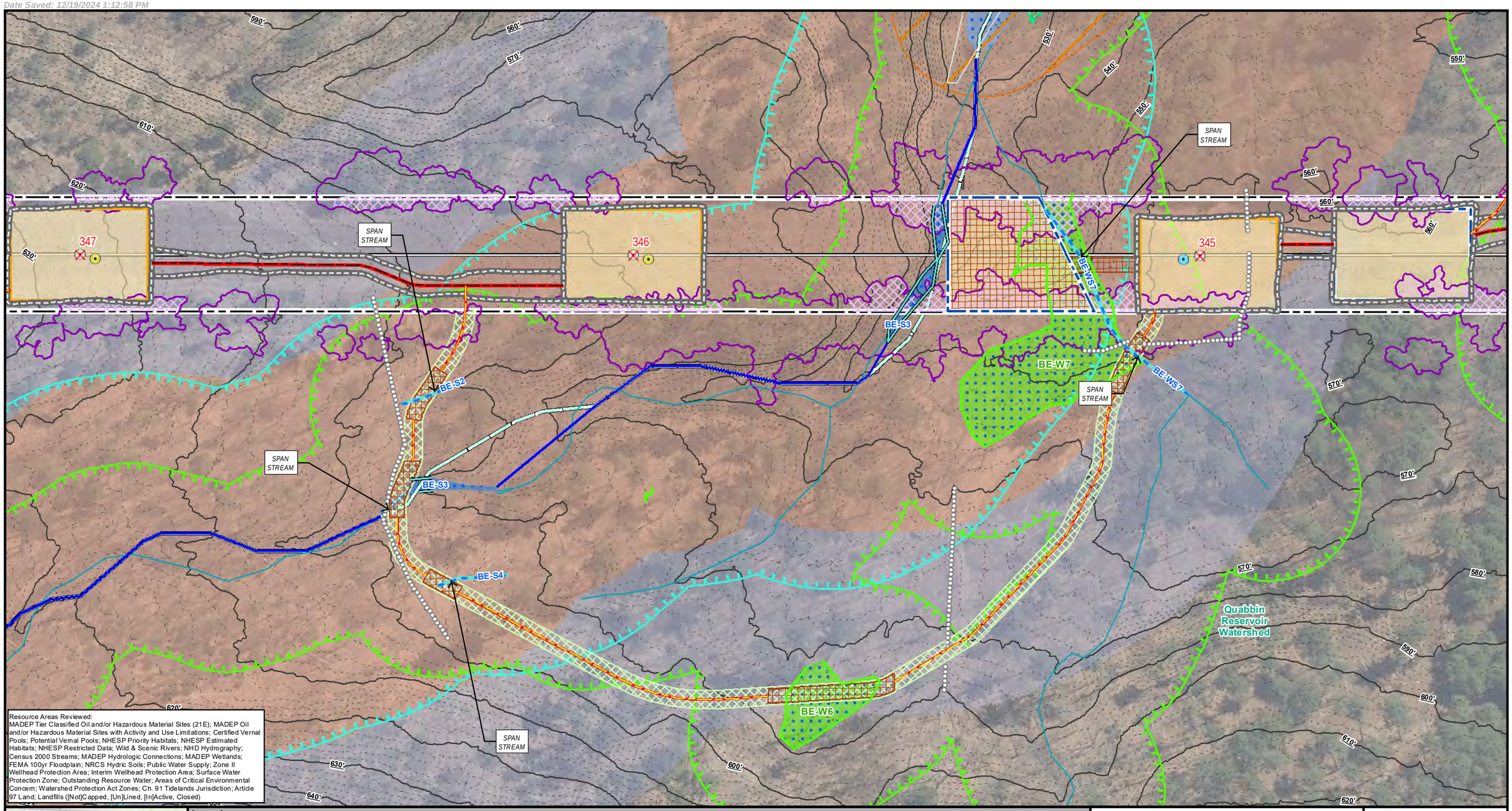

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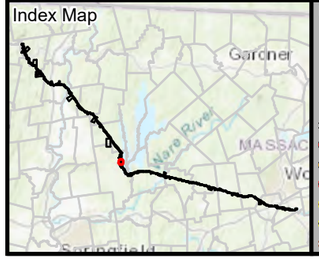

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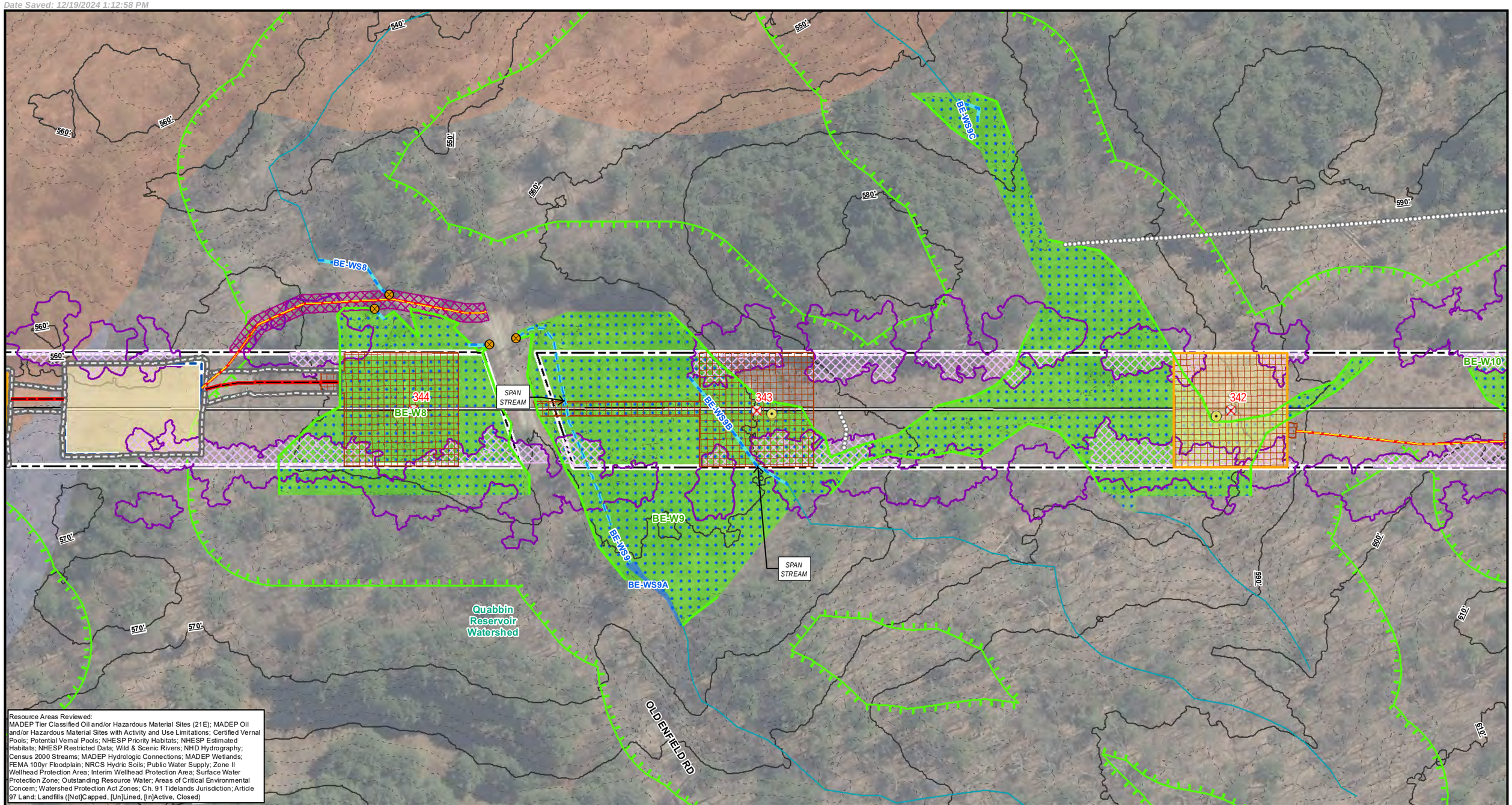

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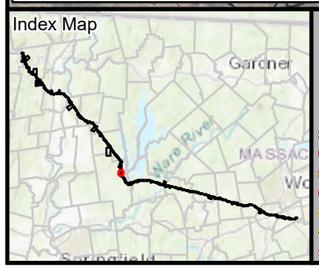

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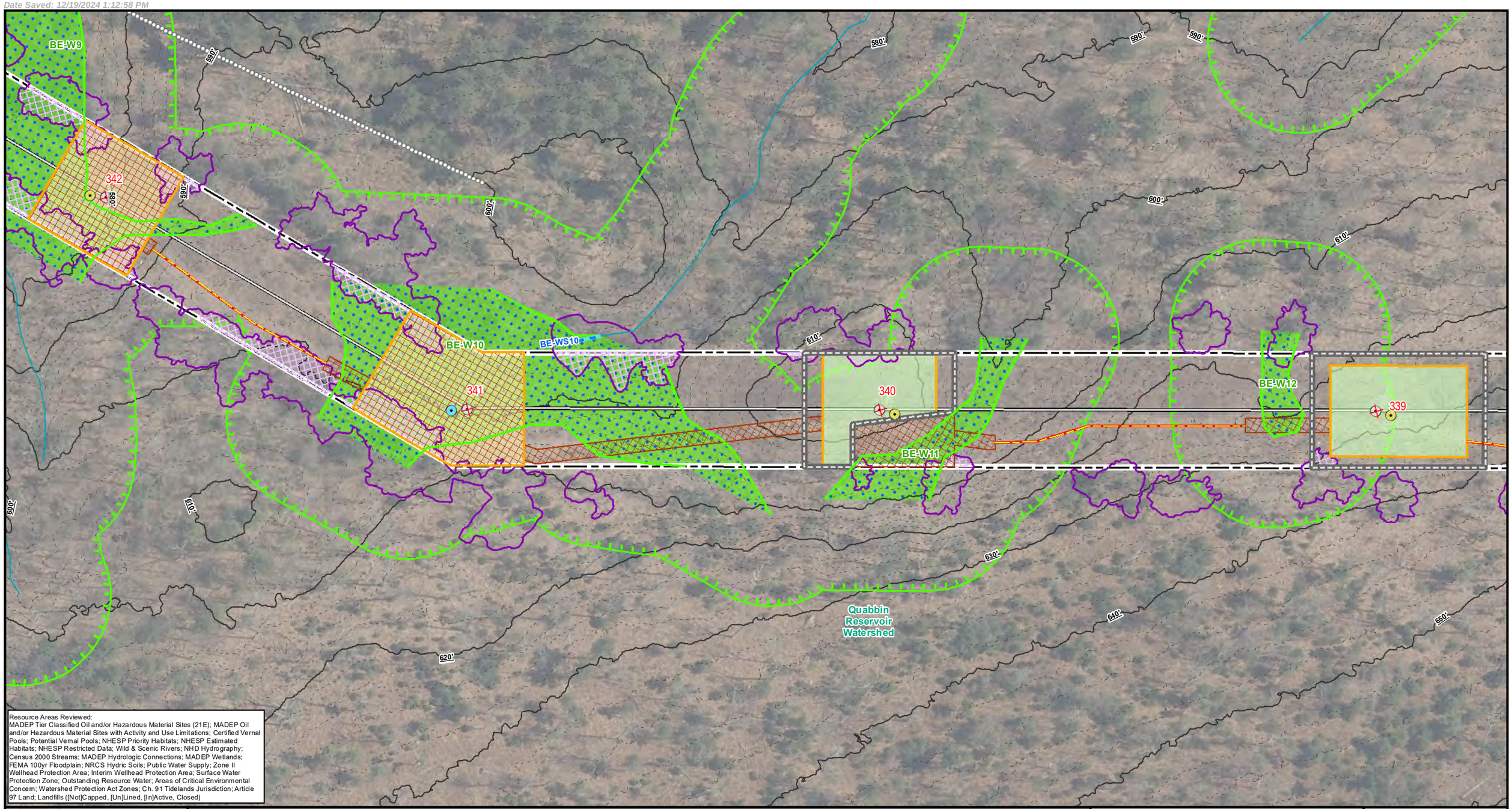

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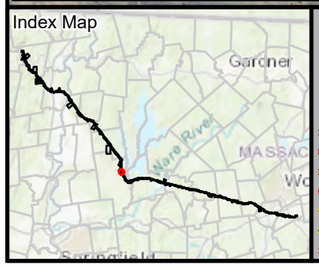

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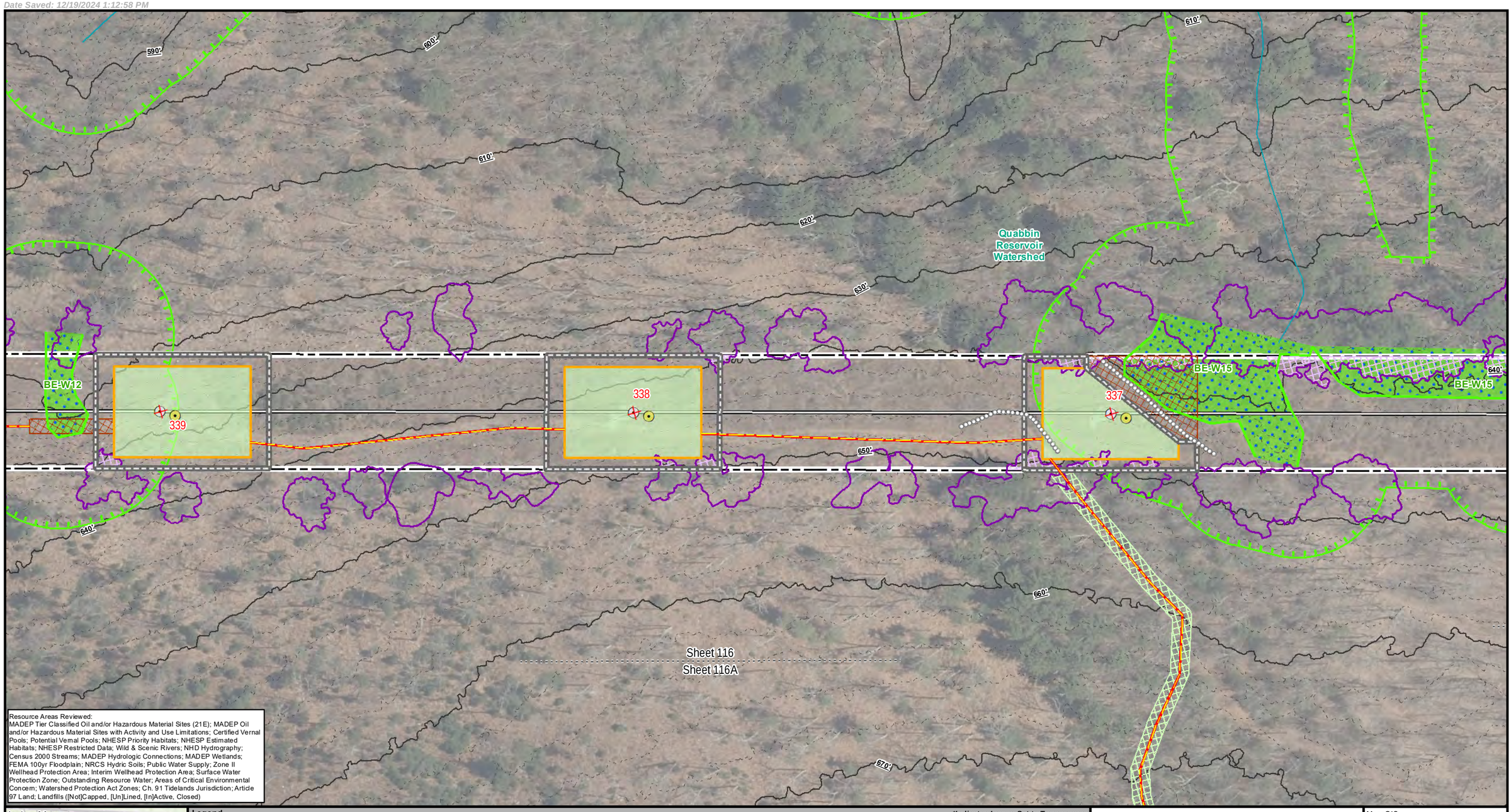

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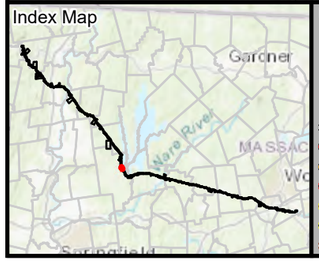

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Gardner
Springfield

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Belchertown, MA
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Article 97 Lands

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0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Belchertown, MA

MassGIS
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640'
650'
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Quabbin Reservoir Watershed
333
332
331

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Index Map
Gardner
Springfield

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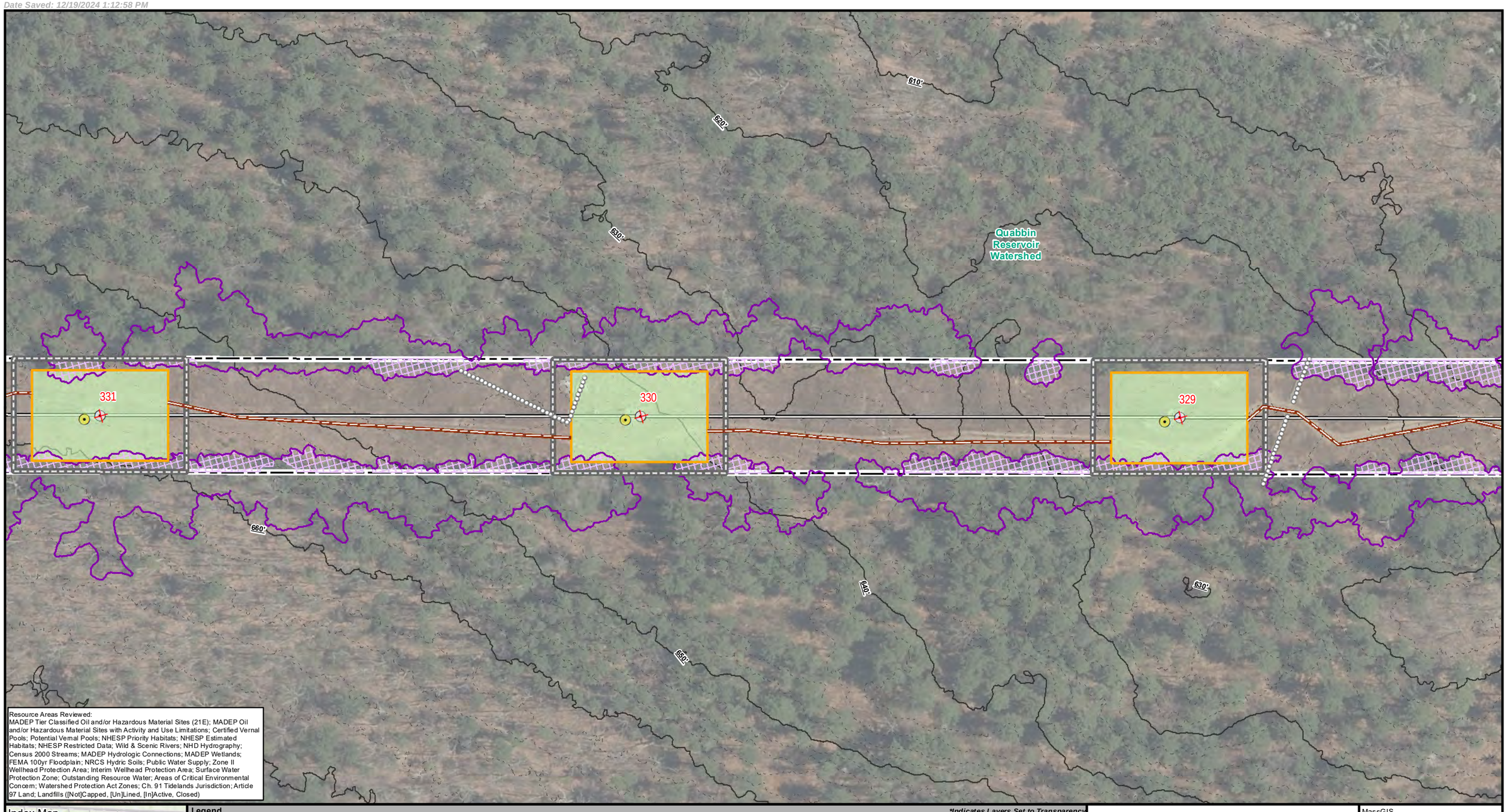

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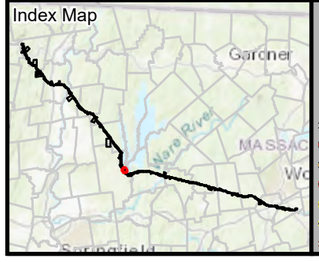

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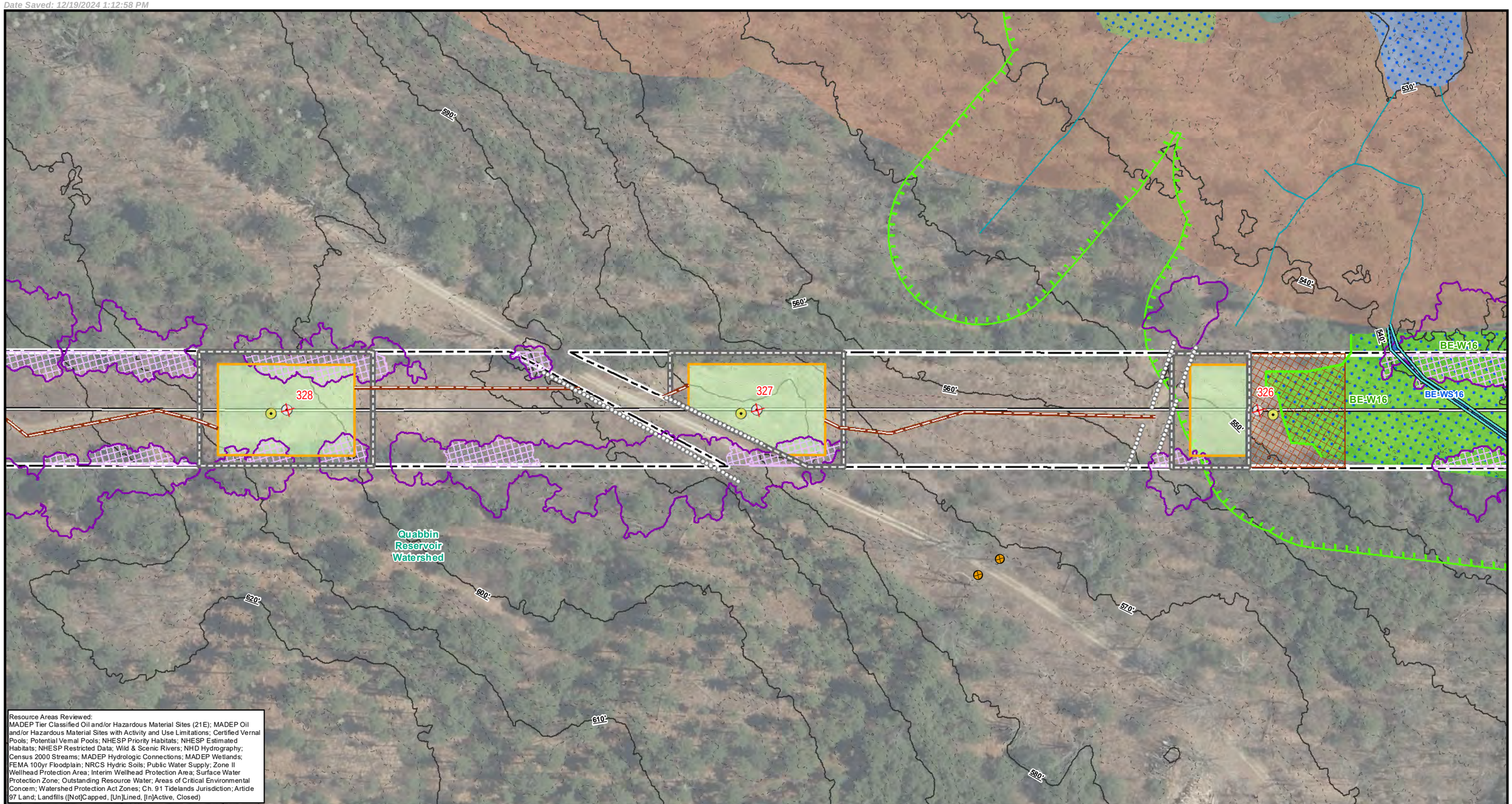

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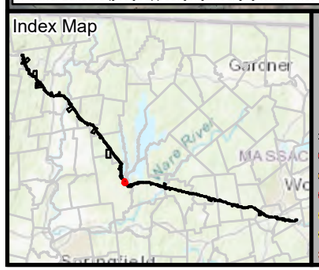

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Environmental Resources Map

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Quabbin Reservoir Watershed

BE-W16

BE-W17

BE-W18

BE-WS16

BE-WS16A

SPAN STREAM

326

325

324

530'

540'

570'

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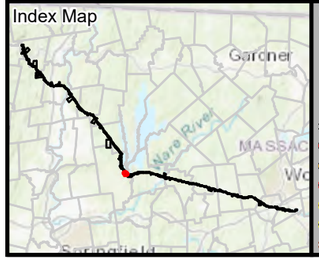

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BE-W16
BE-W17
BE-W18
BE-W19
BE-W20
324
323
322
1E
1F
2E
2F
3E
3F
6T1
6T2
530'
540'
550'
Quabbin Reservoir Watershed
QUABBIN RESERVOIR WORKER HOUSING
BLUE MEADOW RD

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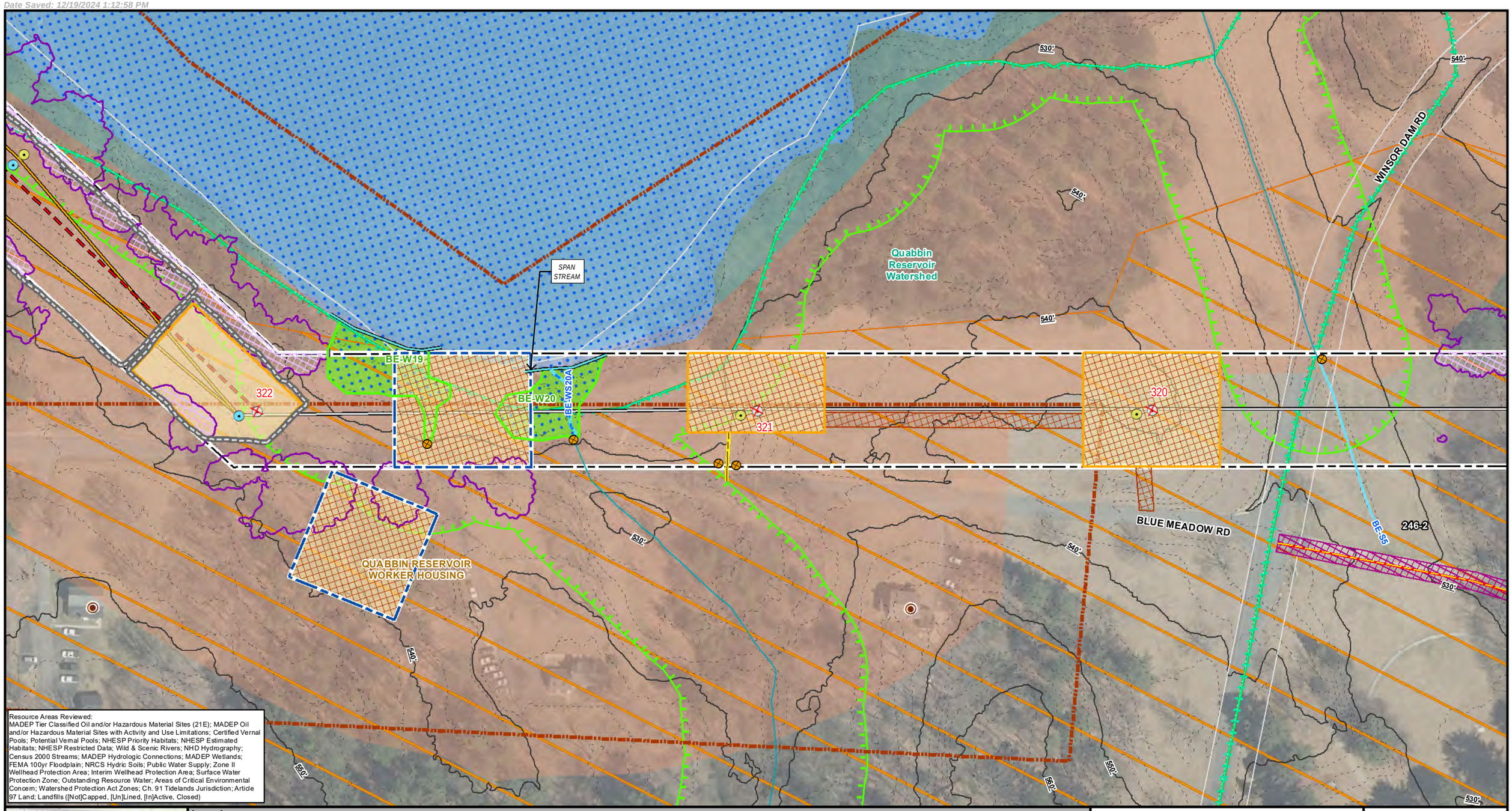

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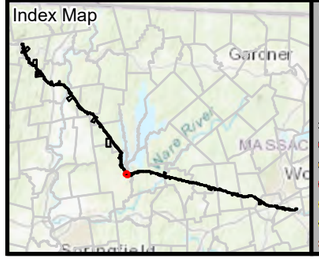

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WINSOR DAM RD

Quabbin Reservoir Watershed

246-2

319

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Sheet 124
Sheet 124A

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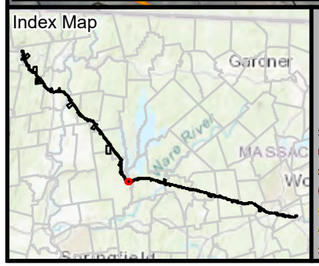

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Article 97 Lands

- DCR-Water Supply Protection

N

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Belchertown, MA
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MassGIS
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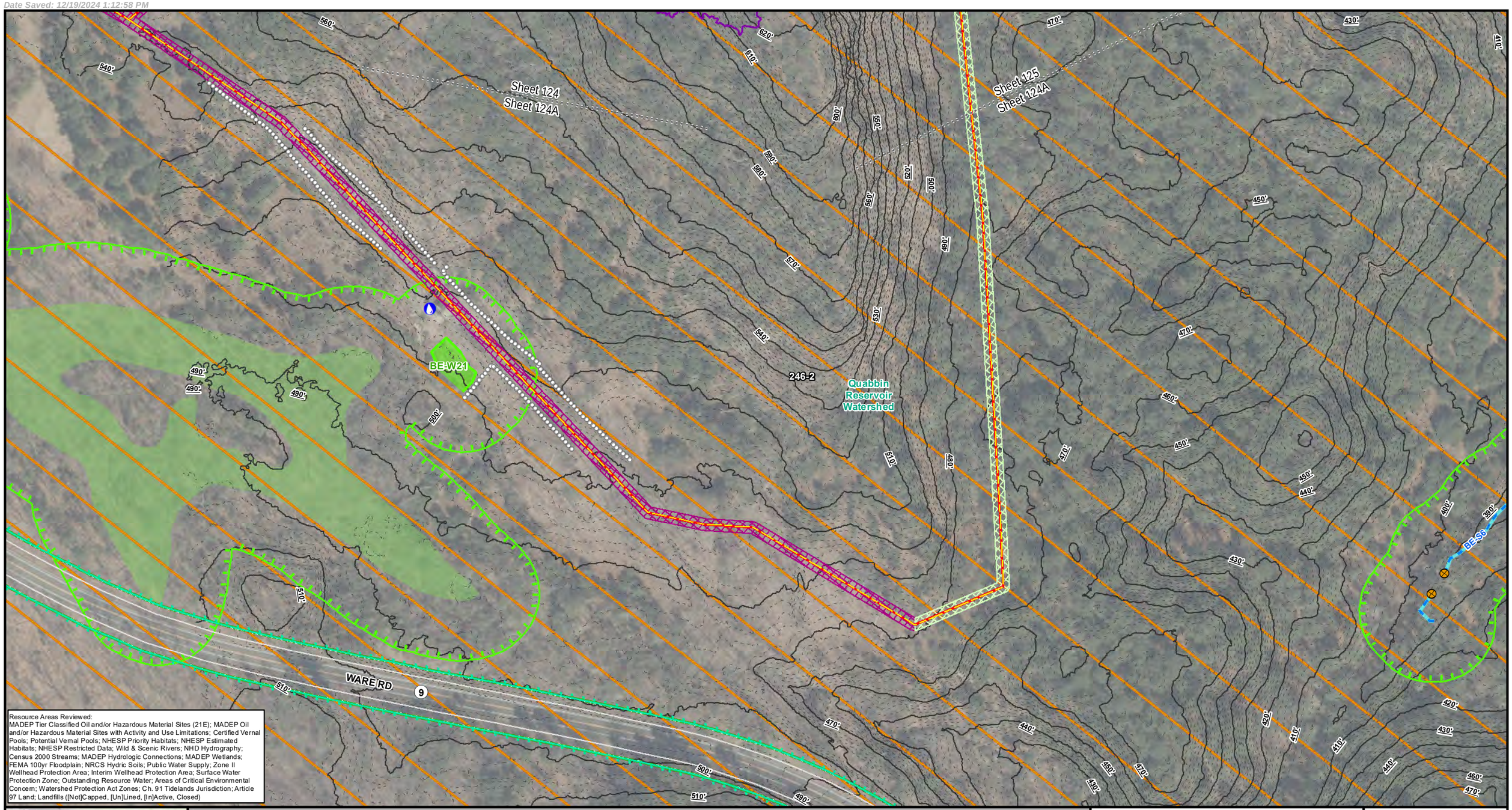

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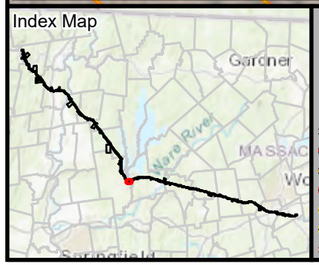

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Environmental Resources Map

Belchertown, MA

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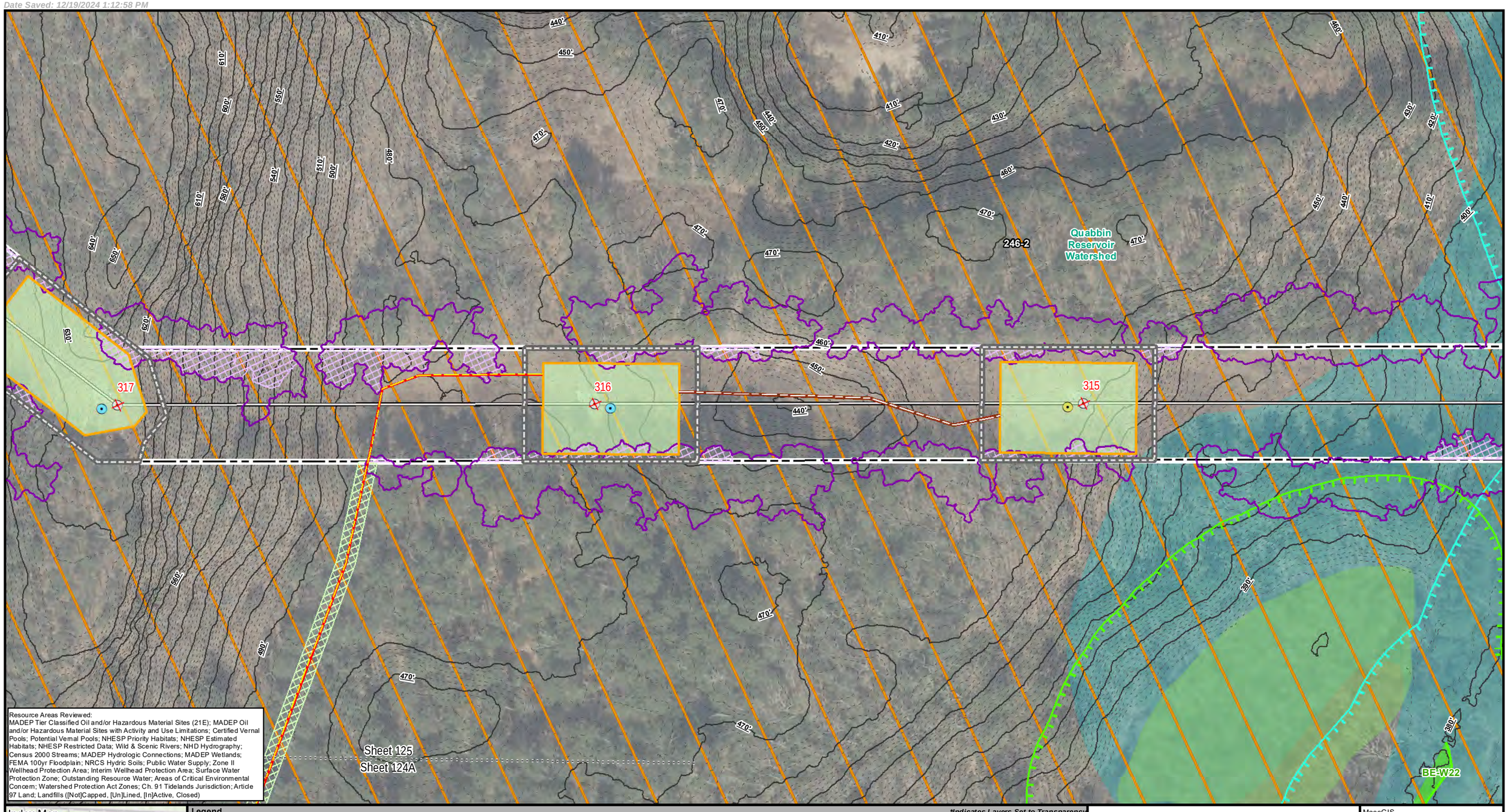

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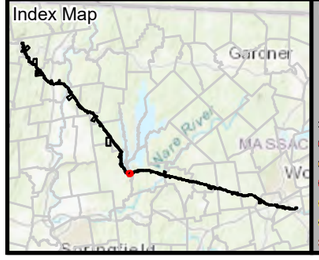

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Quabbin Reservoir Watershed
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Article 97 Lands

- DCR-Water Supply Protection

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Belchertown & Ware, MA

MassGIS
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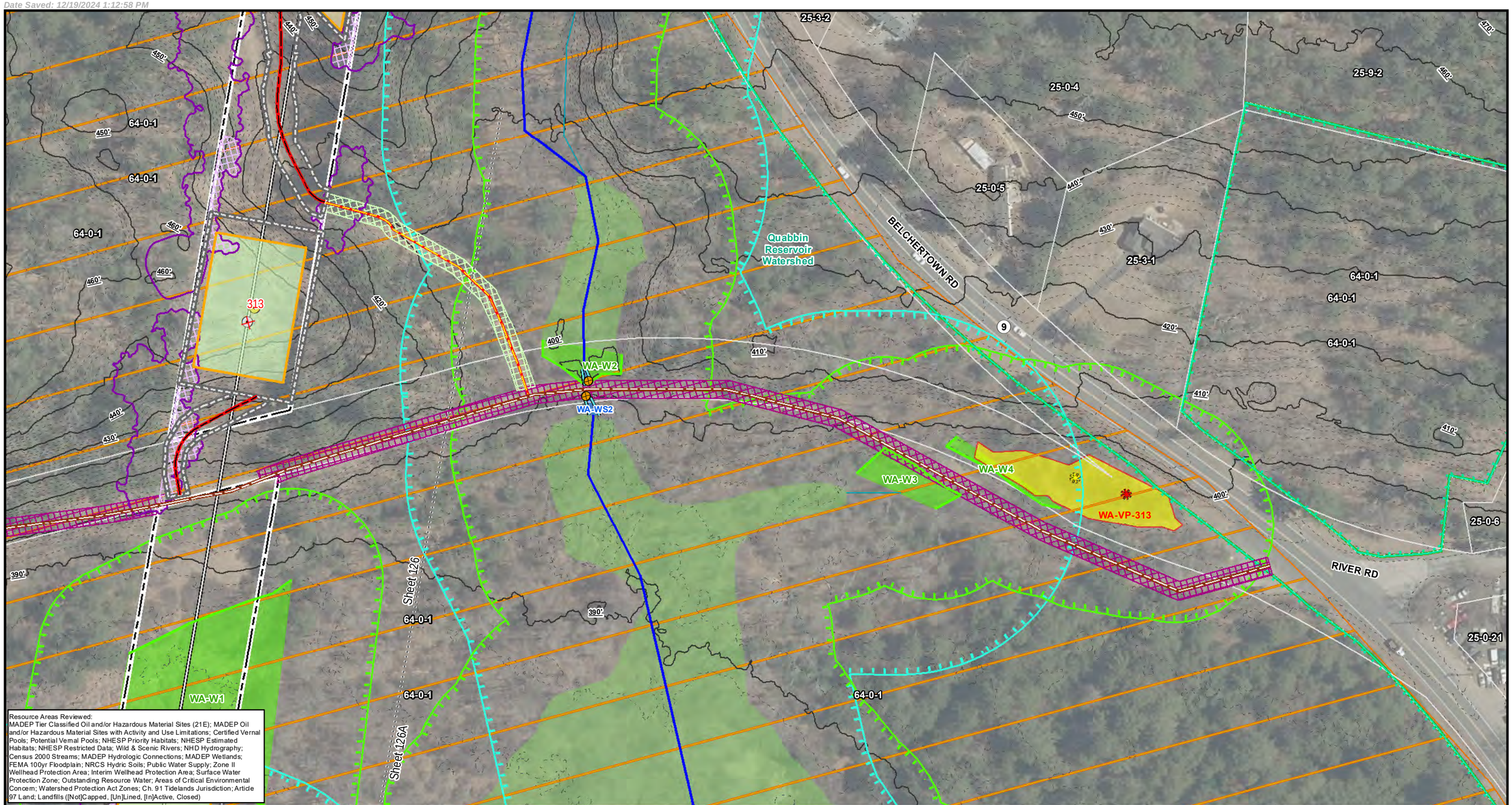

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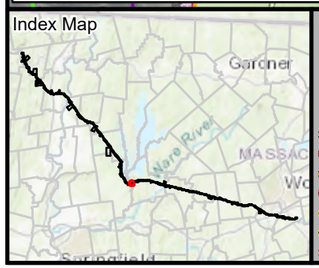

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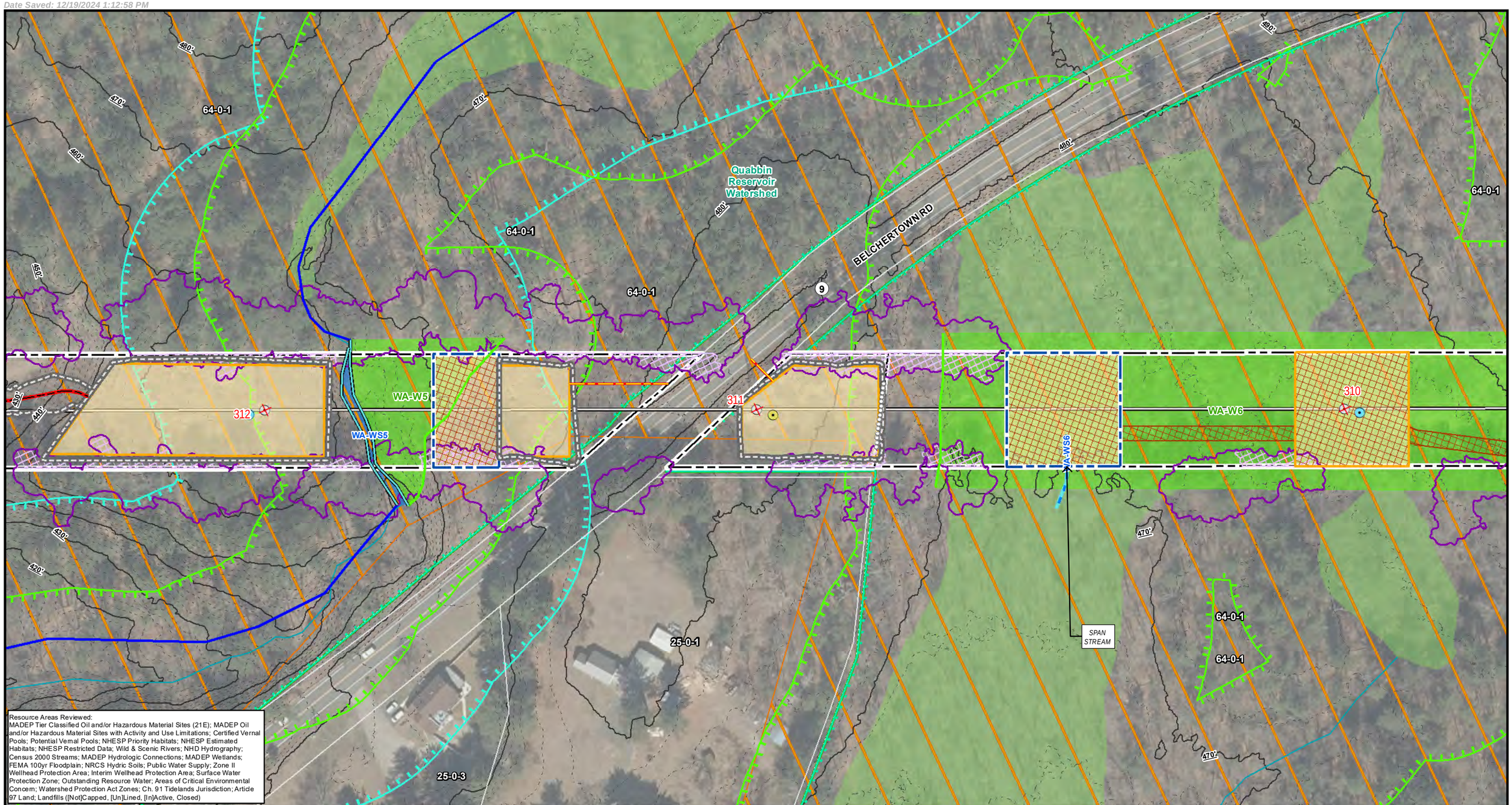

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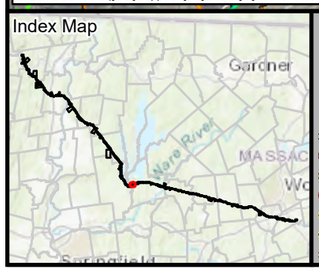

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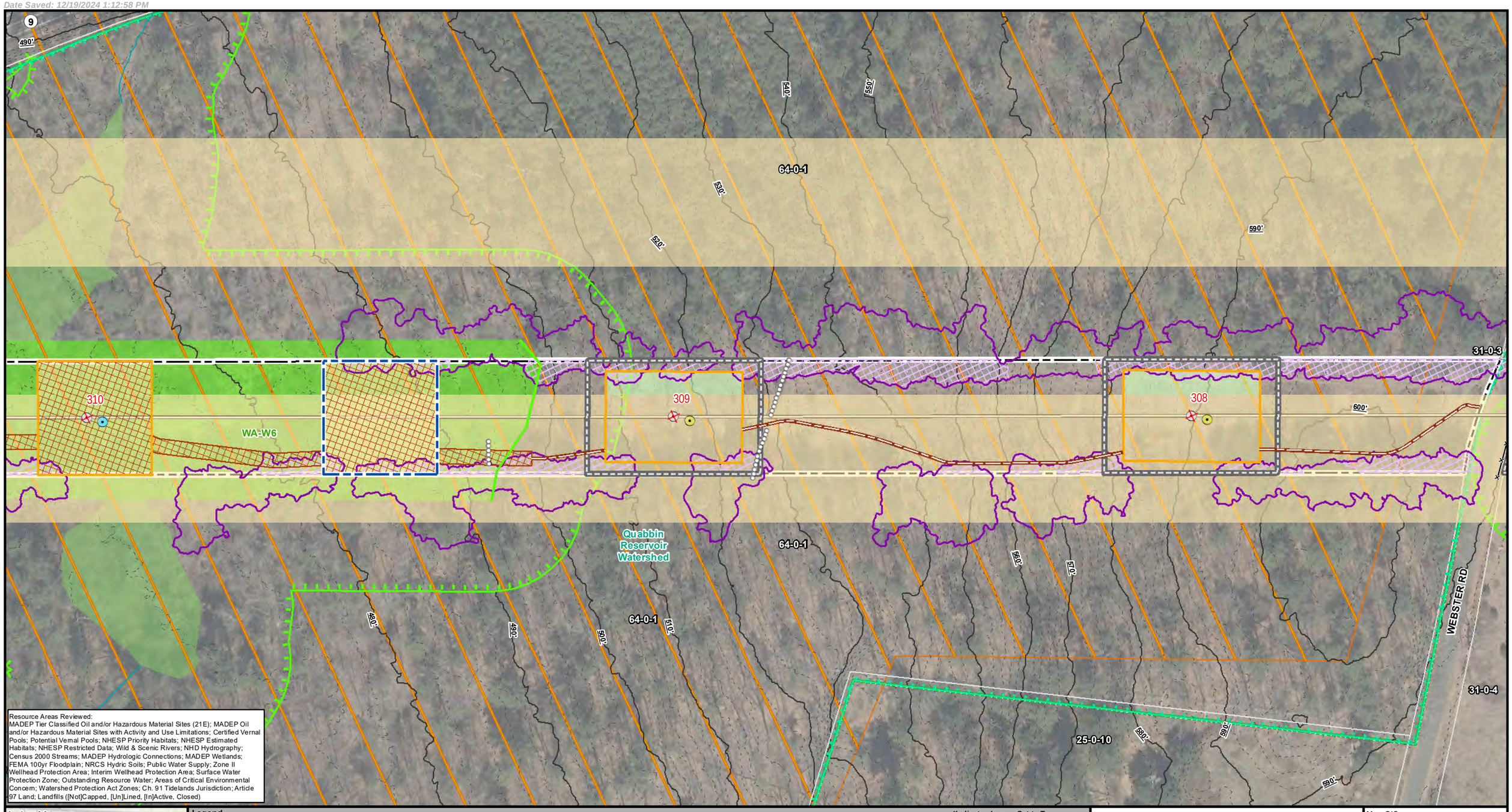

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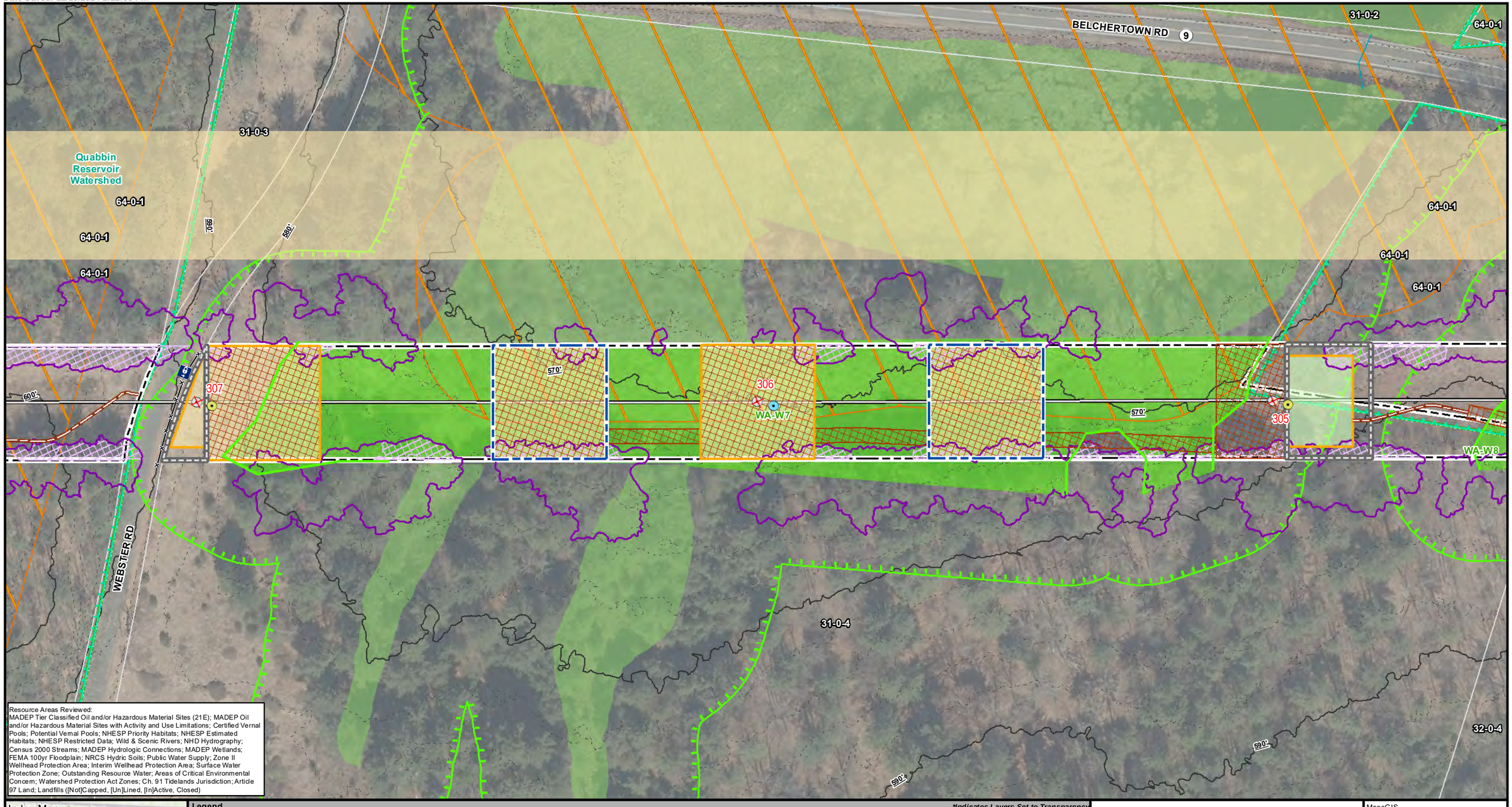

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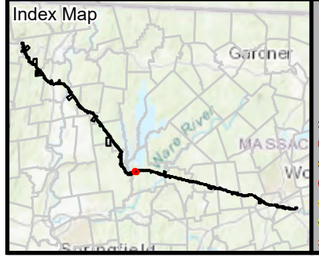

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Ware, MA

MassGIS
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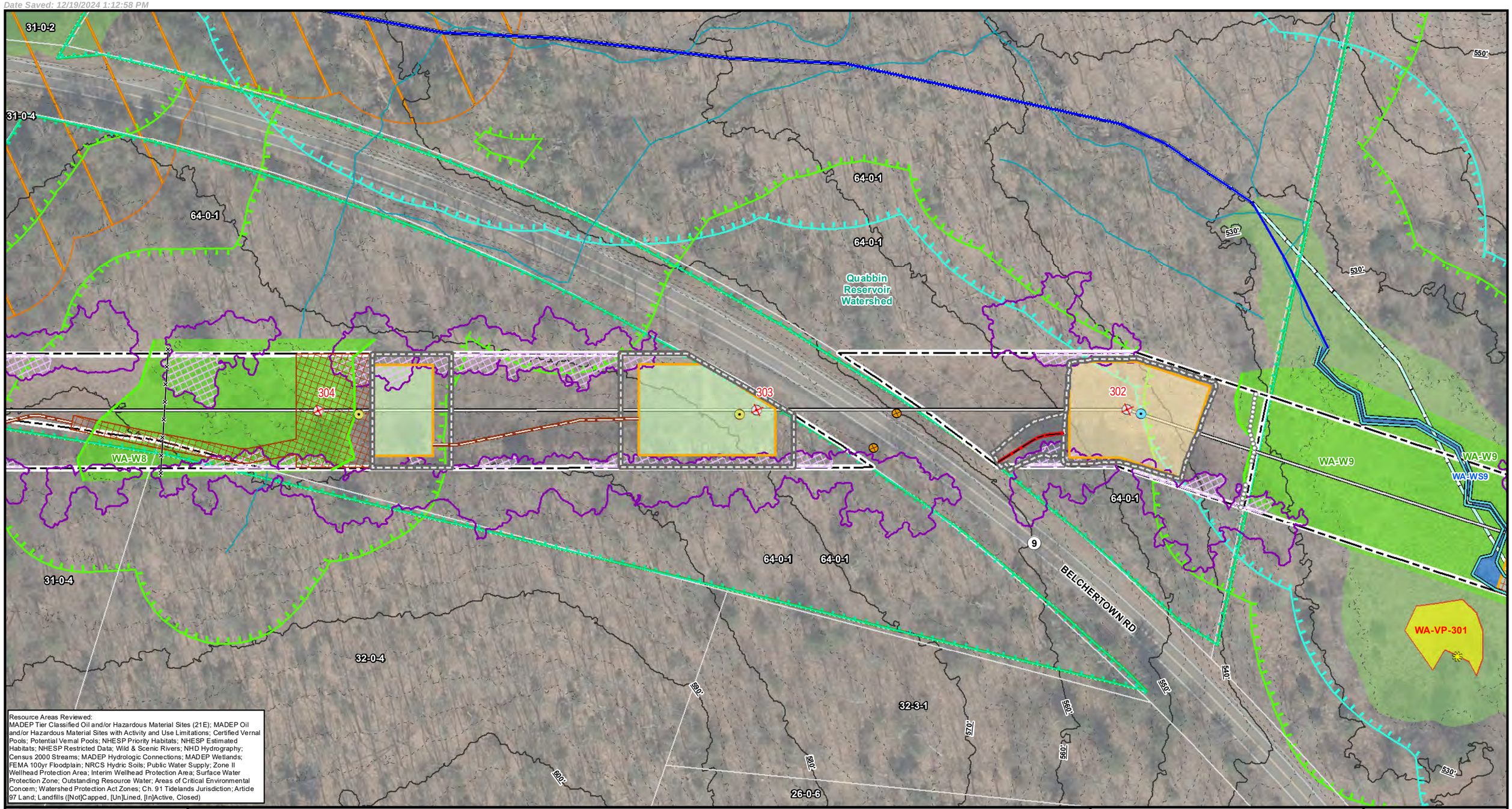

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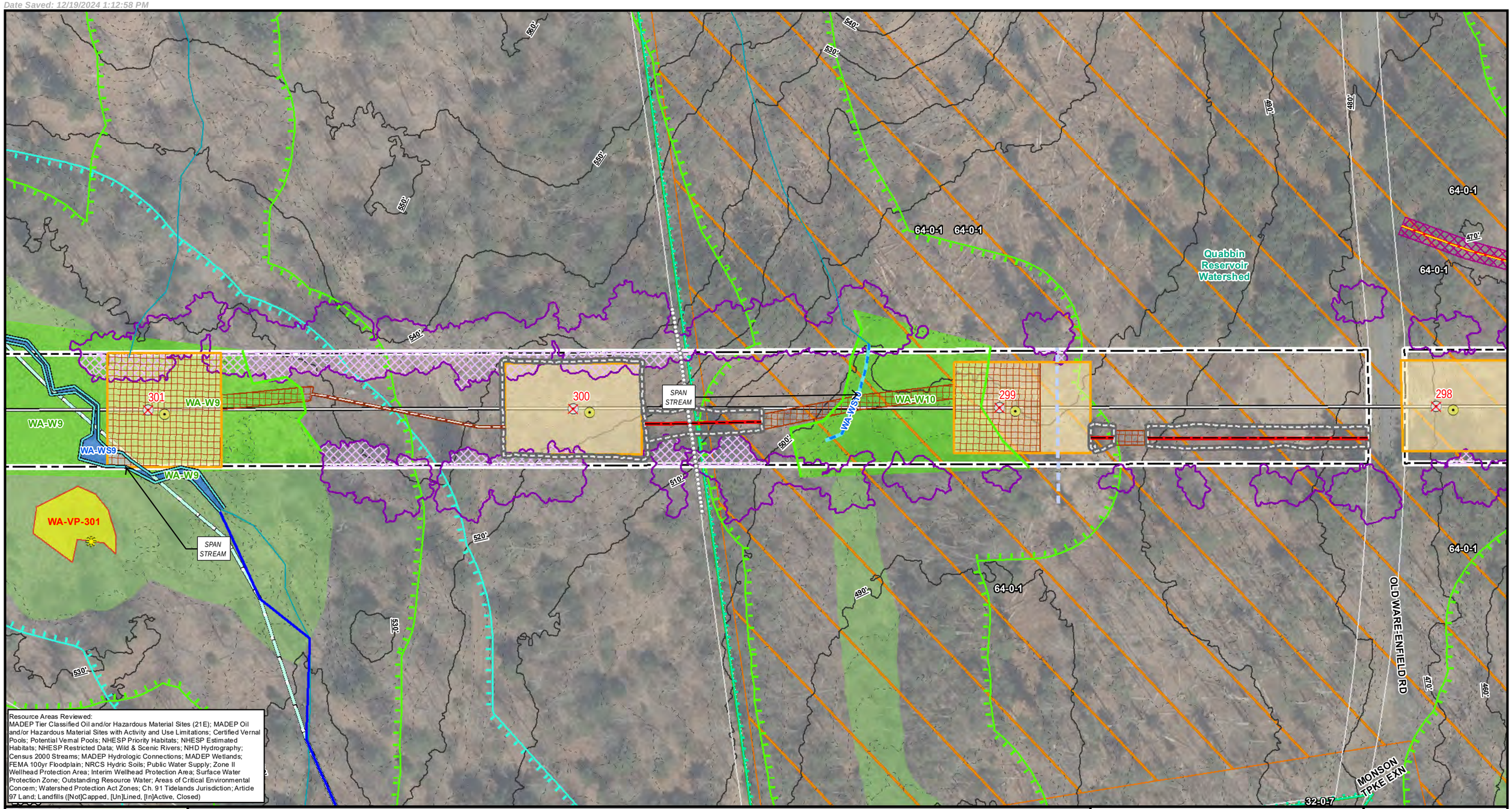

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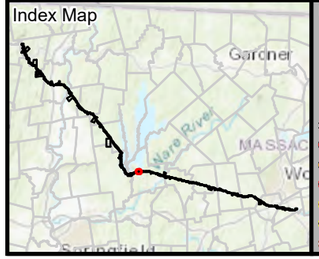

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Quabbin Reservoir Watershed

64-0-1

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OLD WARE-ENFIELD RD

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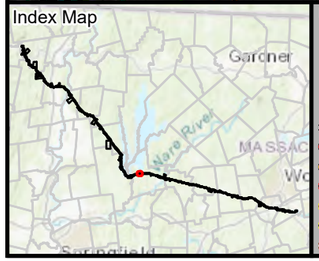

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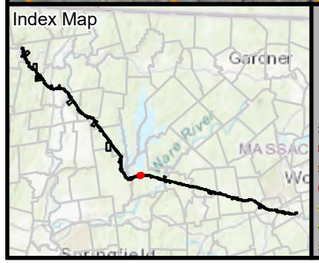

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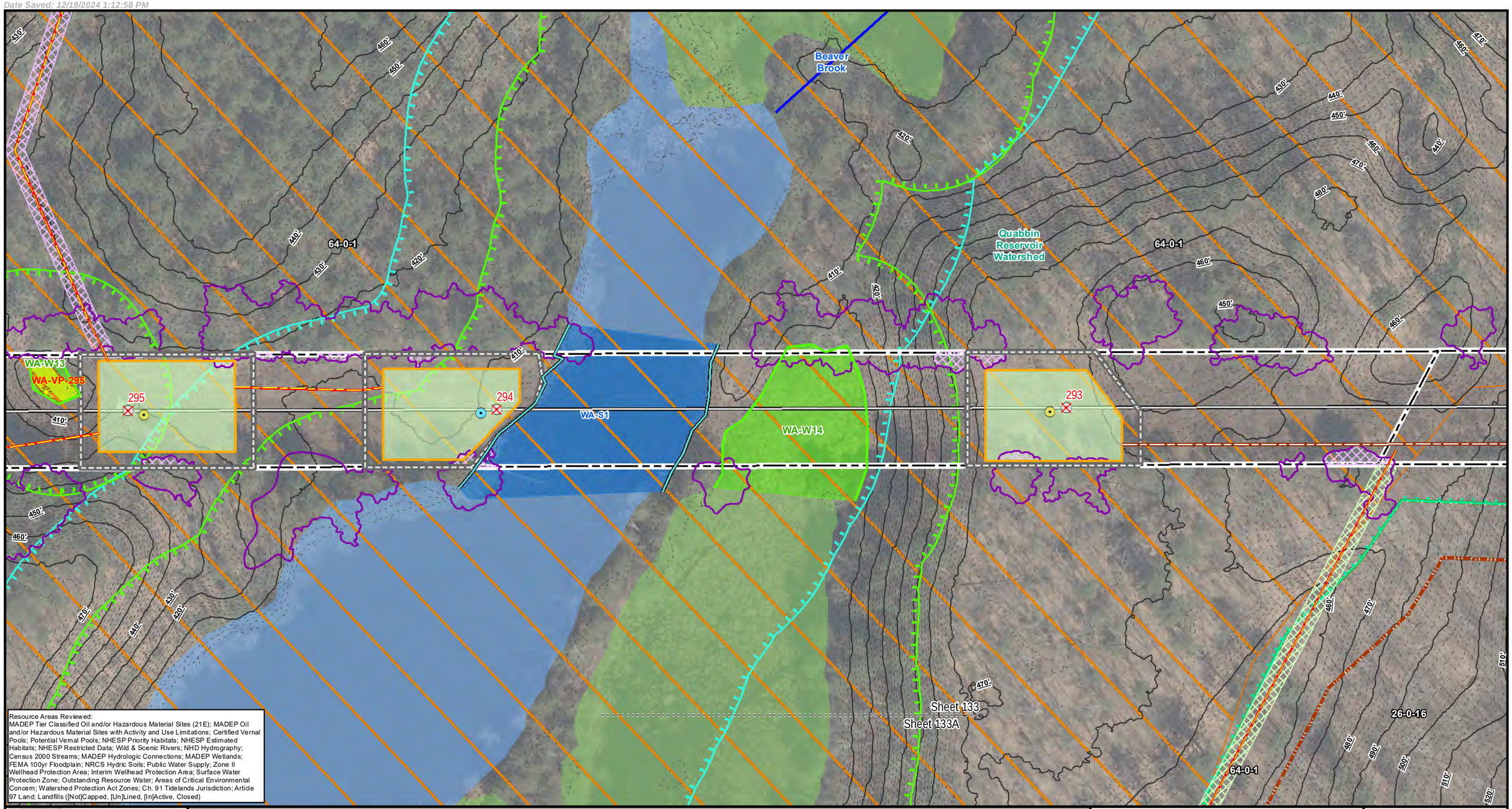

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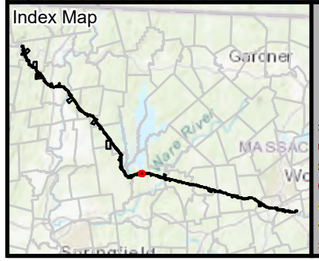

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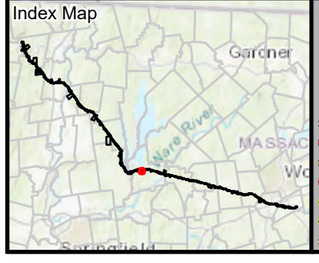

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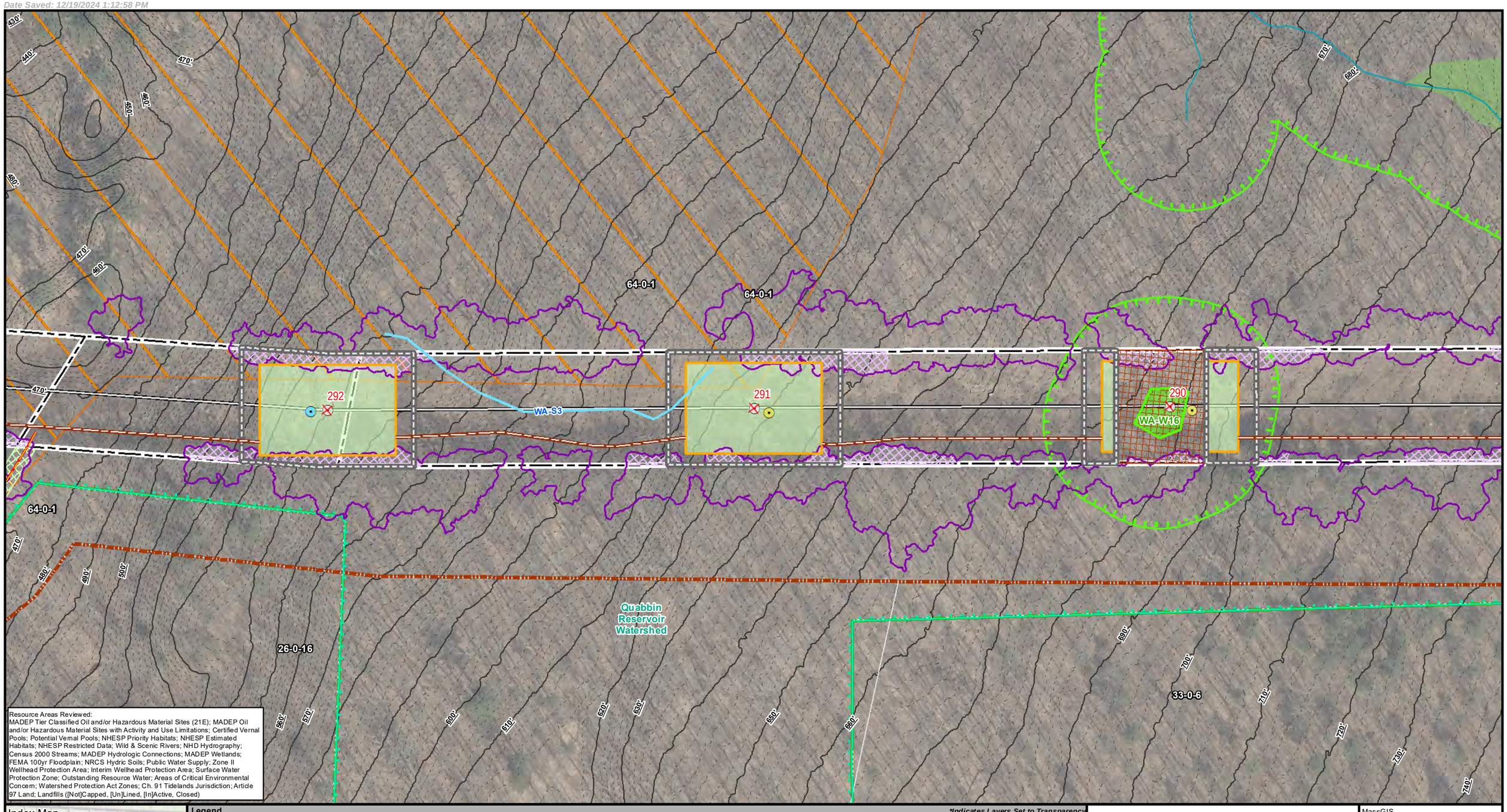

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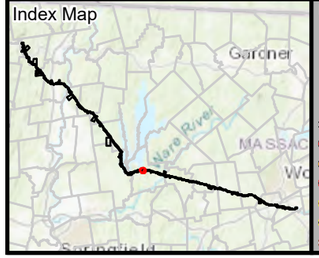

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*Indicates Layers Set to Transparency

- Town Boundary
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Article 97 Lands

- DCR-Water Supply Protection

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Ware, MA

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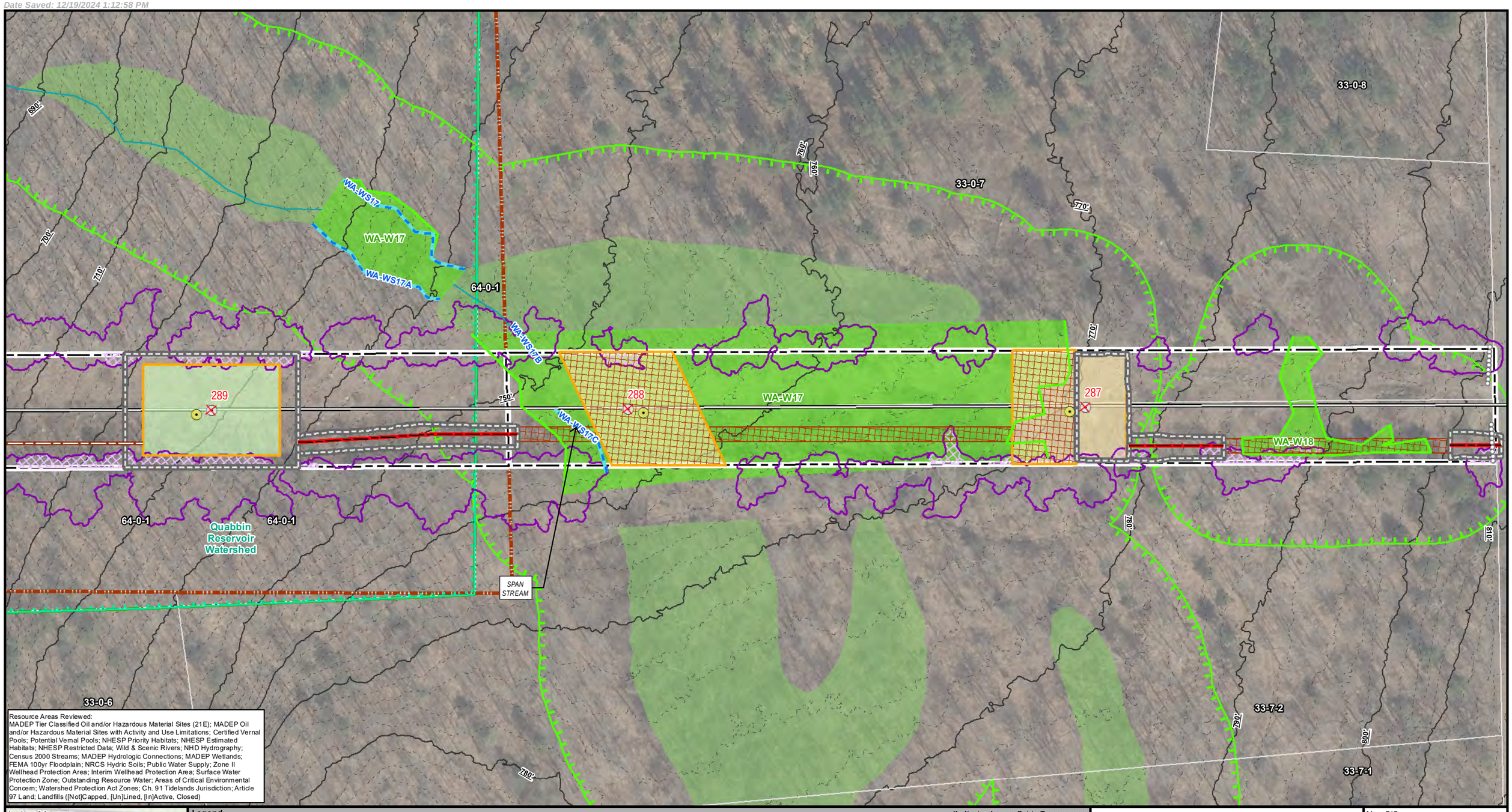

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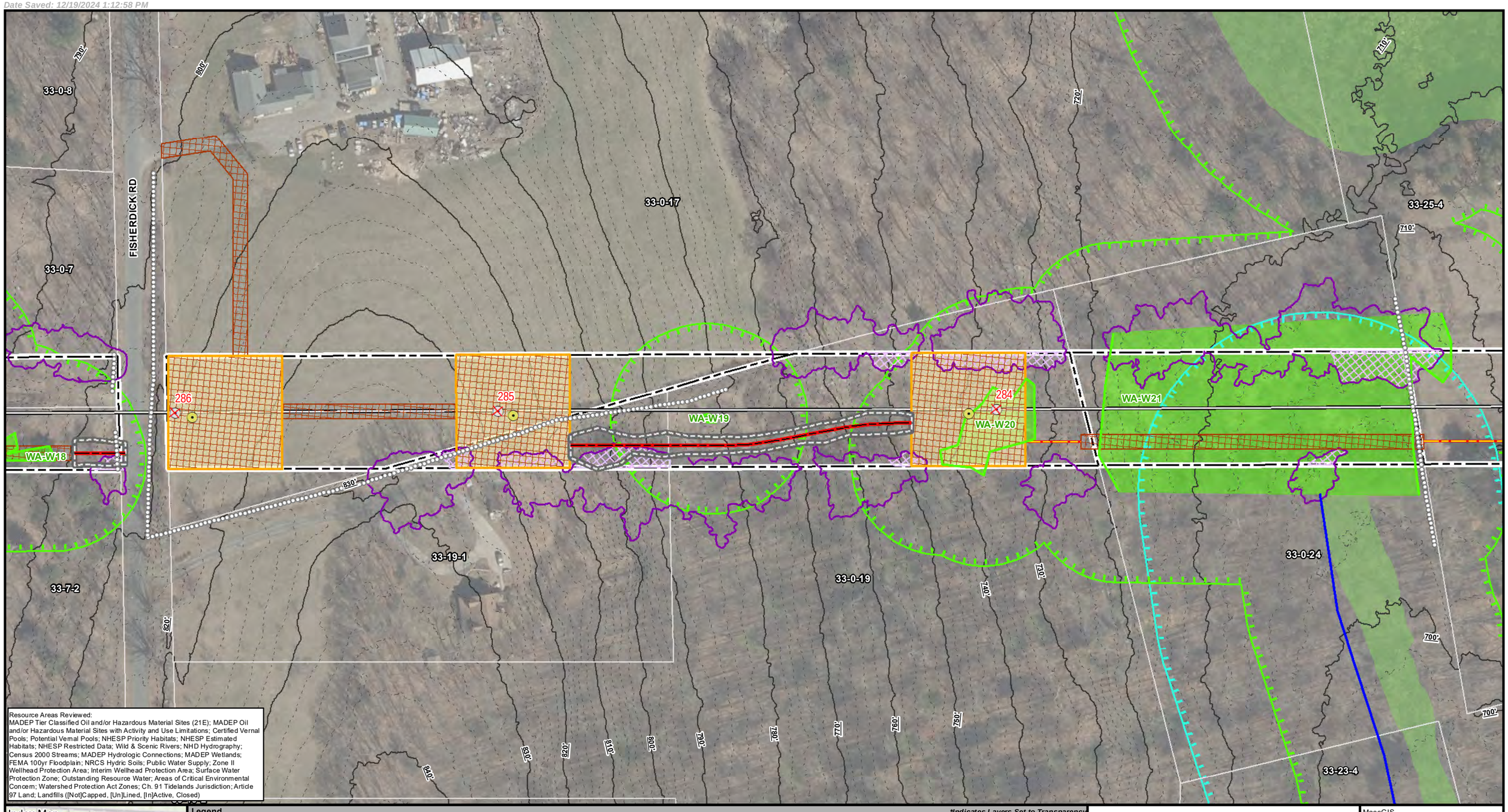

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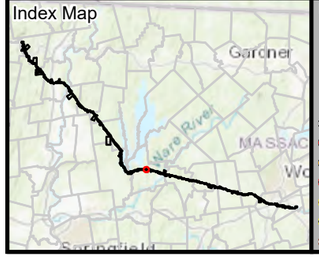

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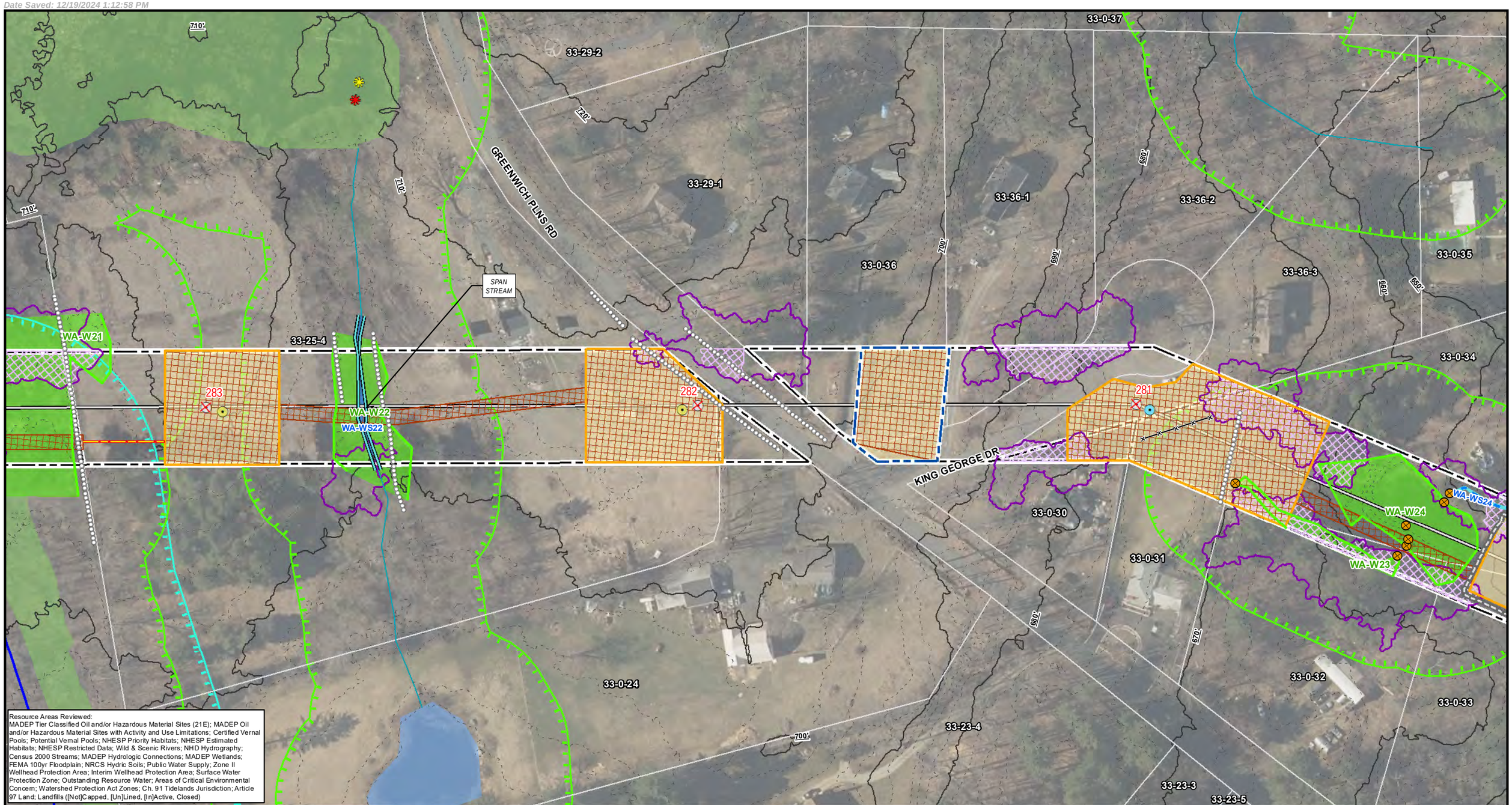

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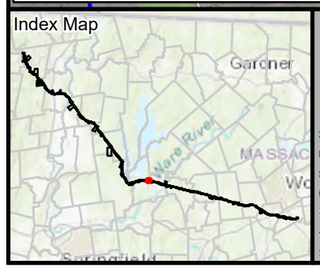

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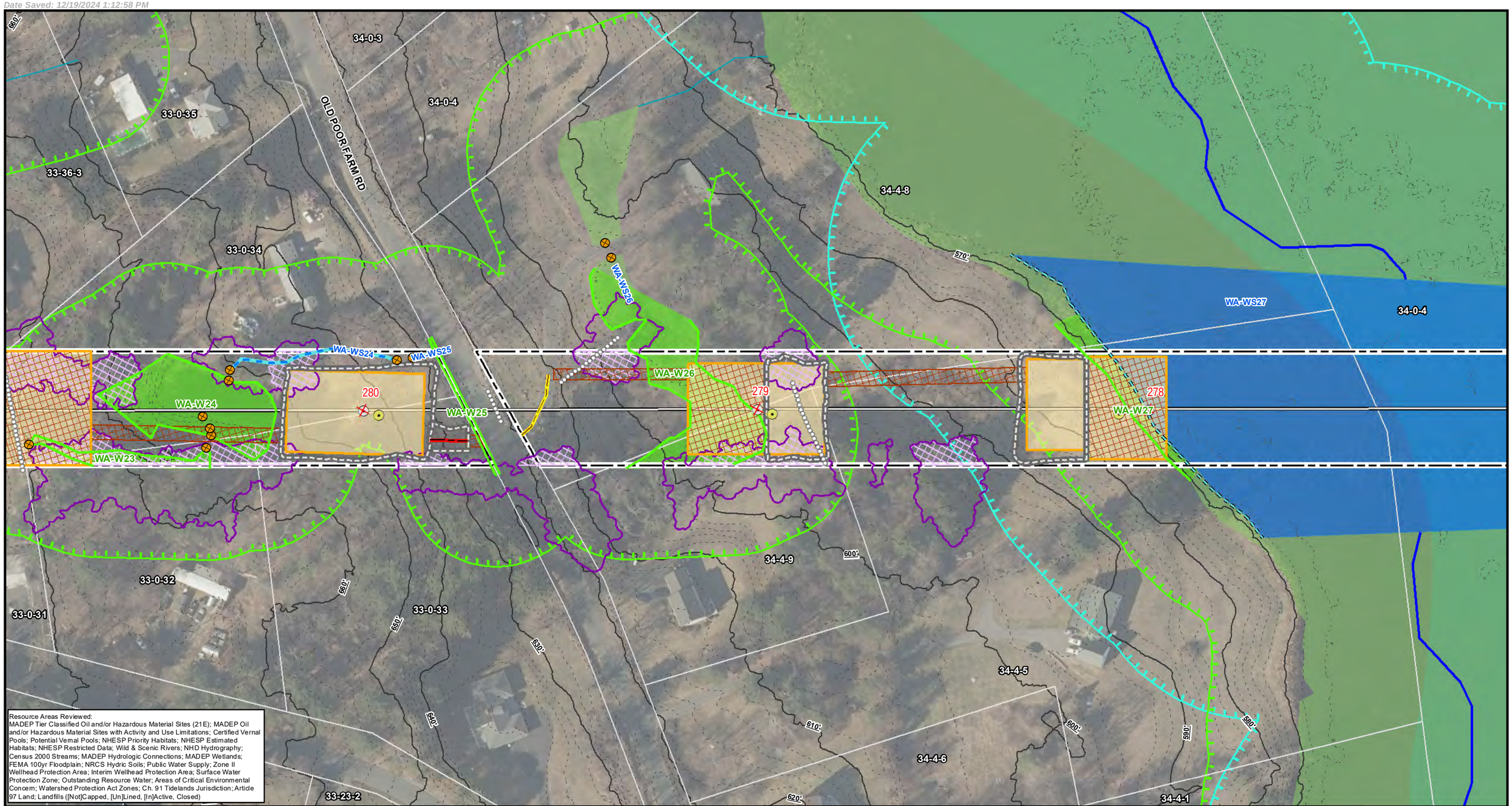

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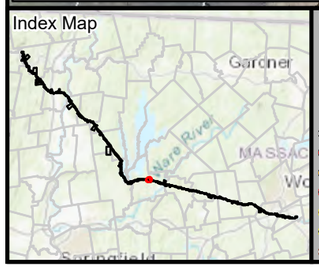

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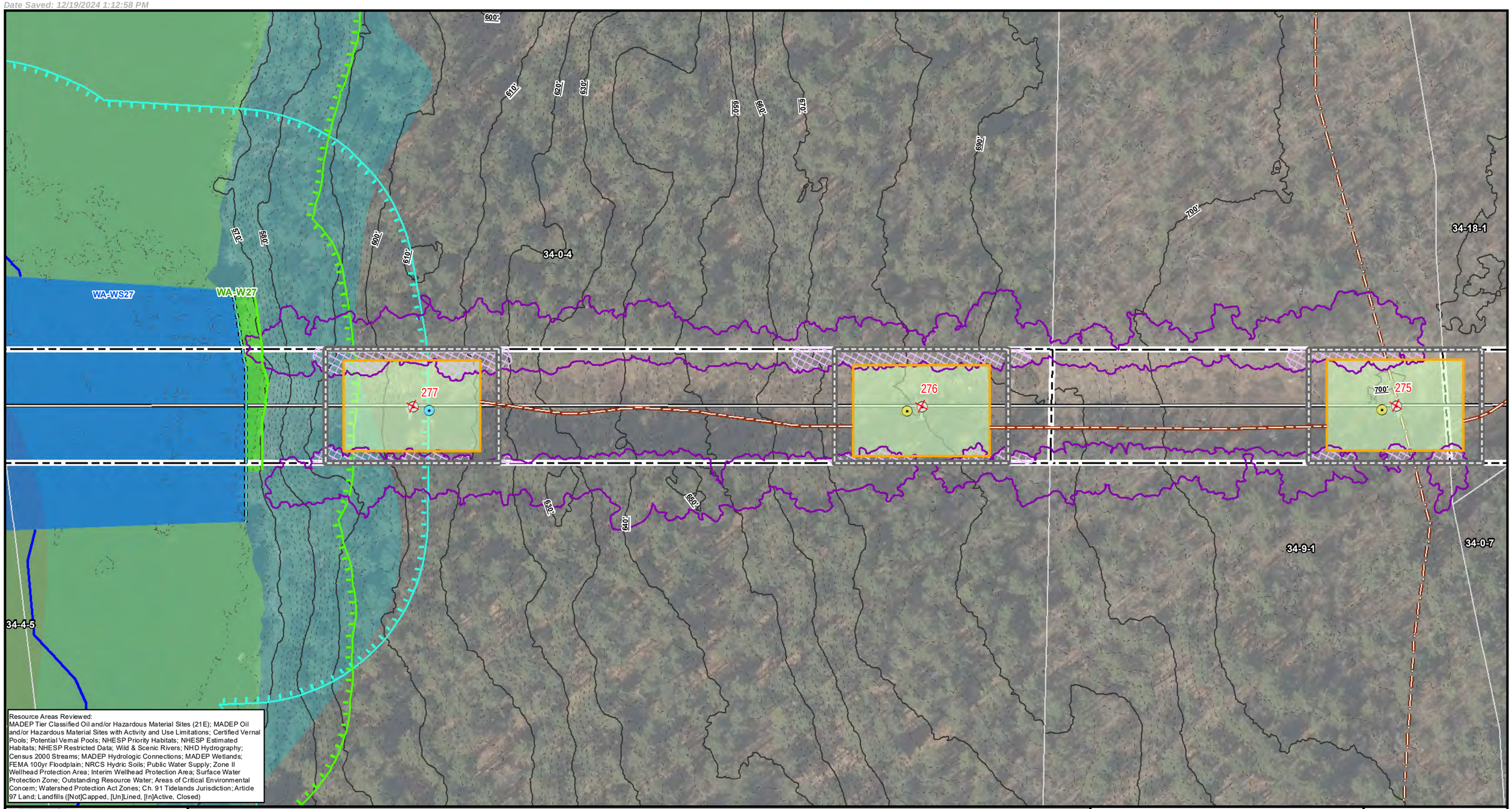

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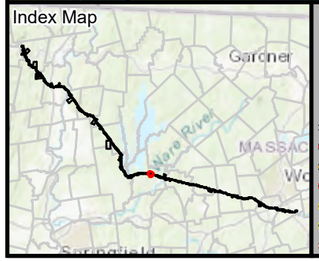

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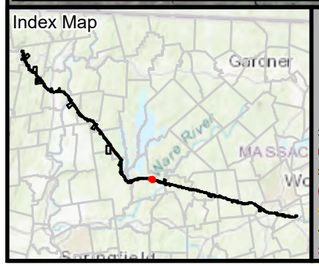

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0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Ware, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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34-0-14
34-0-30
OSBORNE RD
34-0-31
34-33-2
34-13-1
34-13-2
WA-W29
WA-W28
WA-W30
WA-W31
34-0-12
272
271
270
269
34-0-11
34-0-33
28-42-1
34-0-10
700'
690'
680'
670'

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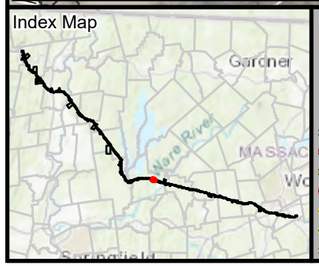

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34-0-31
35-0-2
28-42-1
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WA-W32
WA-W33
WA-W34
268
267
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650'
600'
590'
580'
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540'

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Gardner
Springfield

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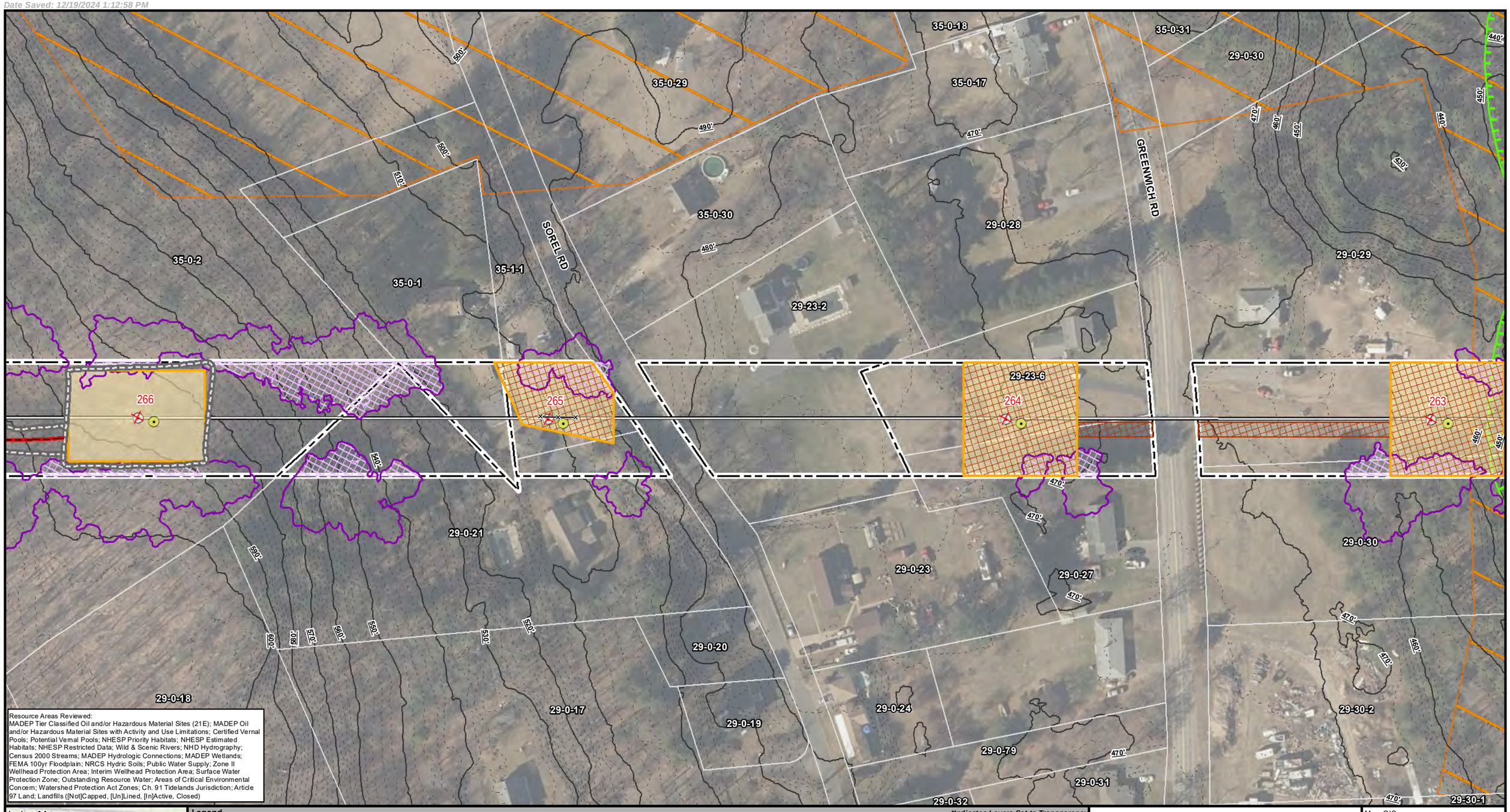

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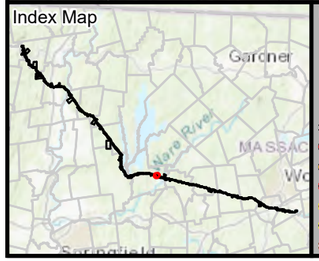

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29-0-30
29-0-29
29-0-48
SPAN STREAM
WA-WS35
WA-W35
WA-W36
WA-S4
263
262
261
Muddy Brook

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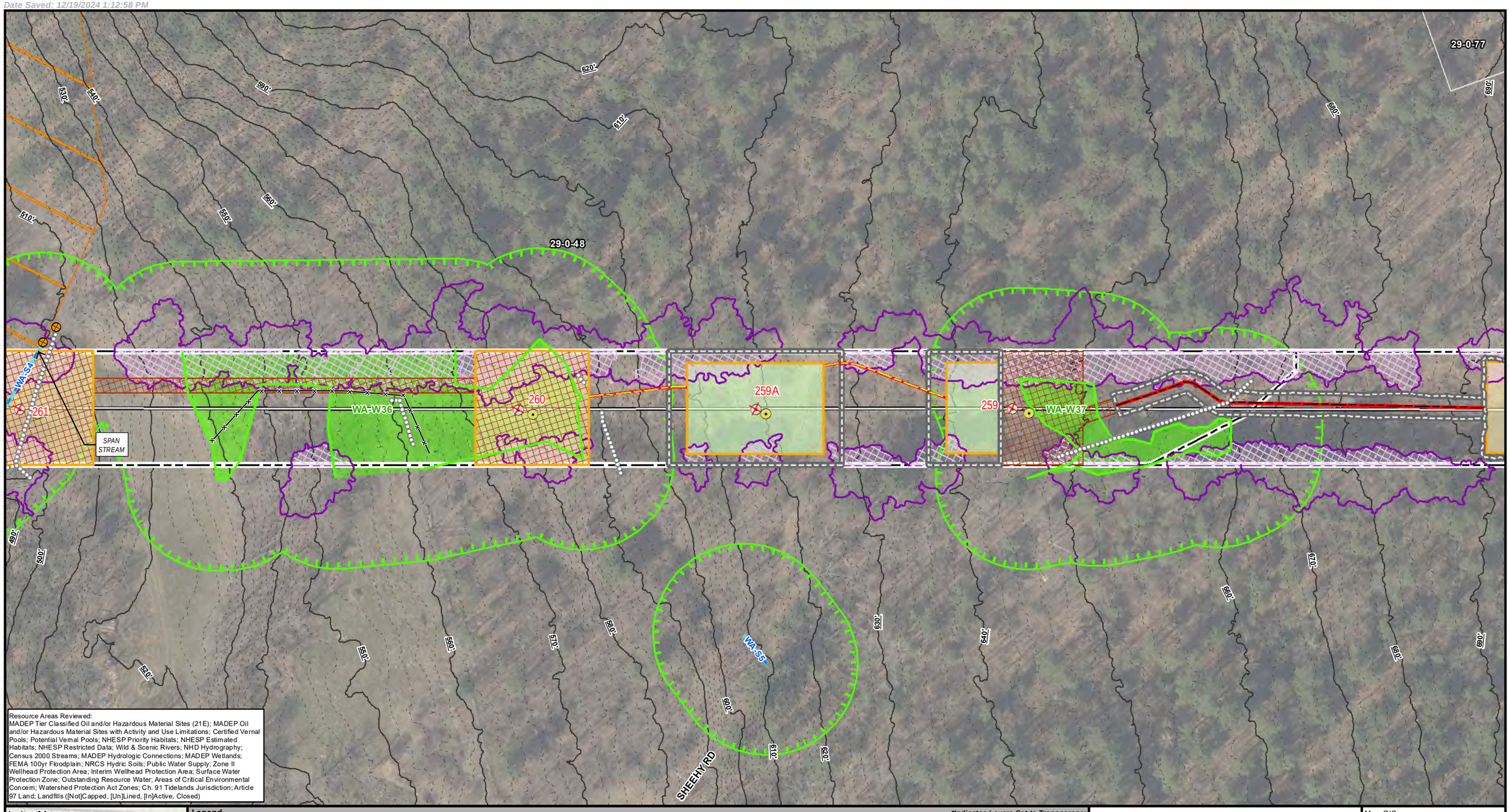

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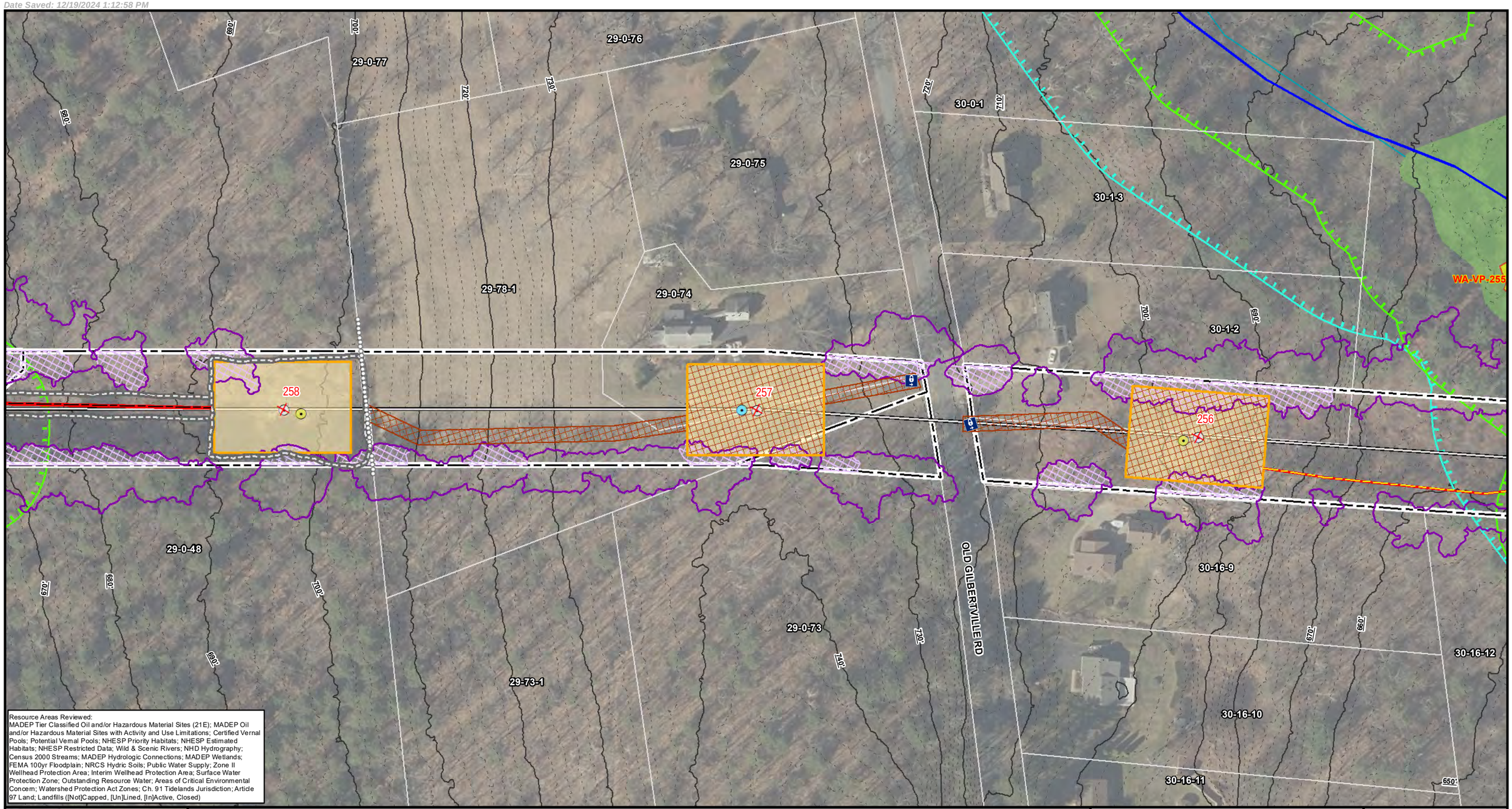

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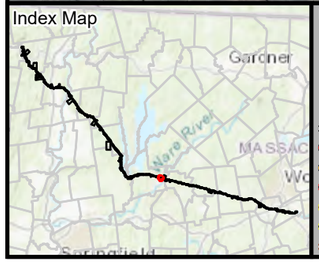

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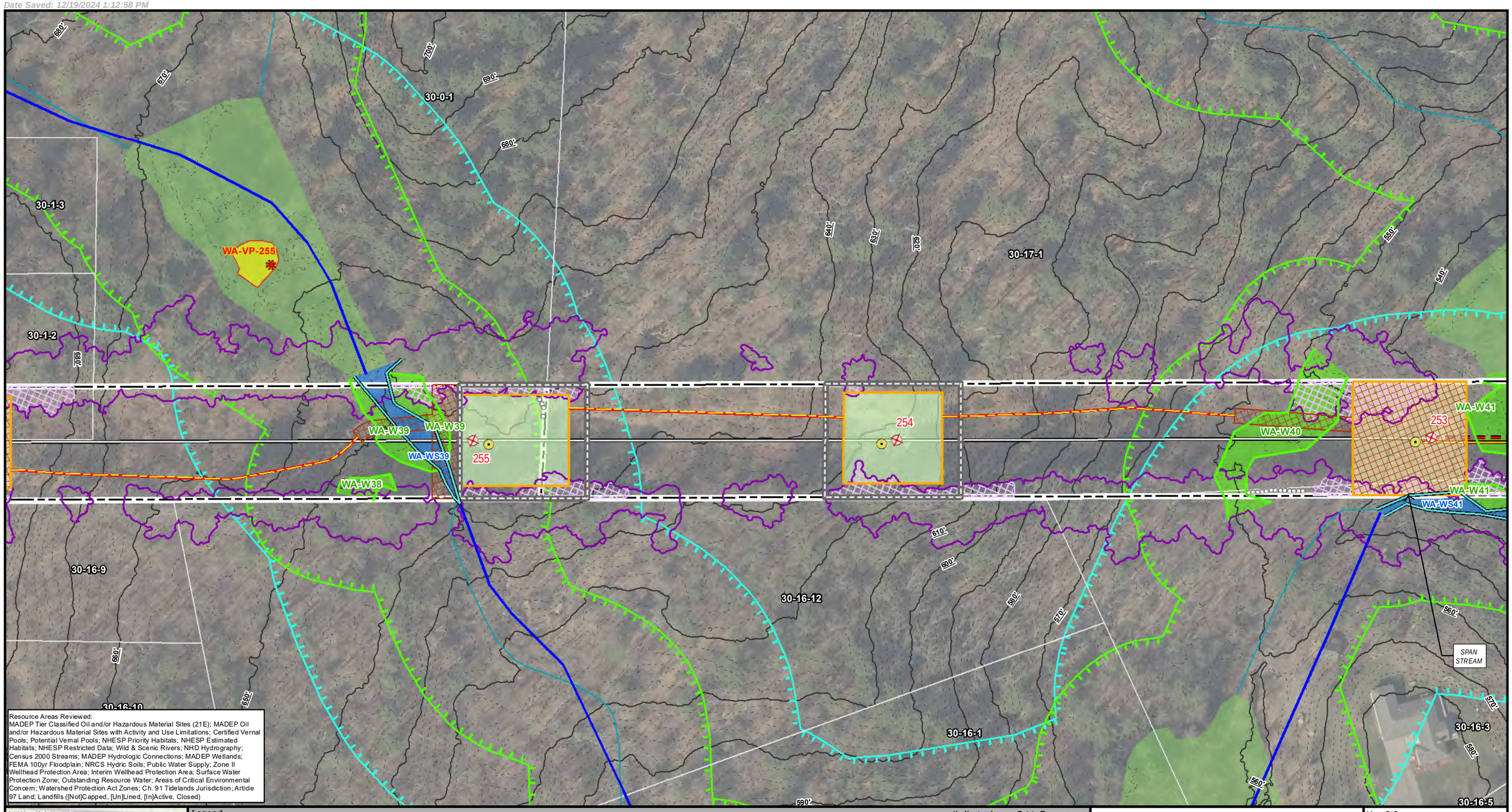

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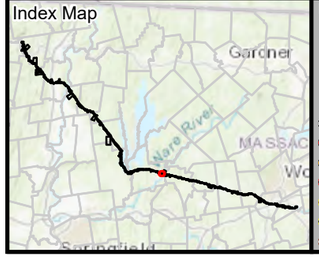

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N

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Ware, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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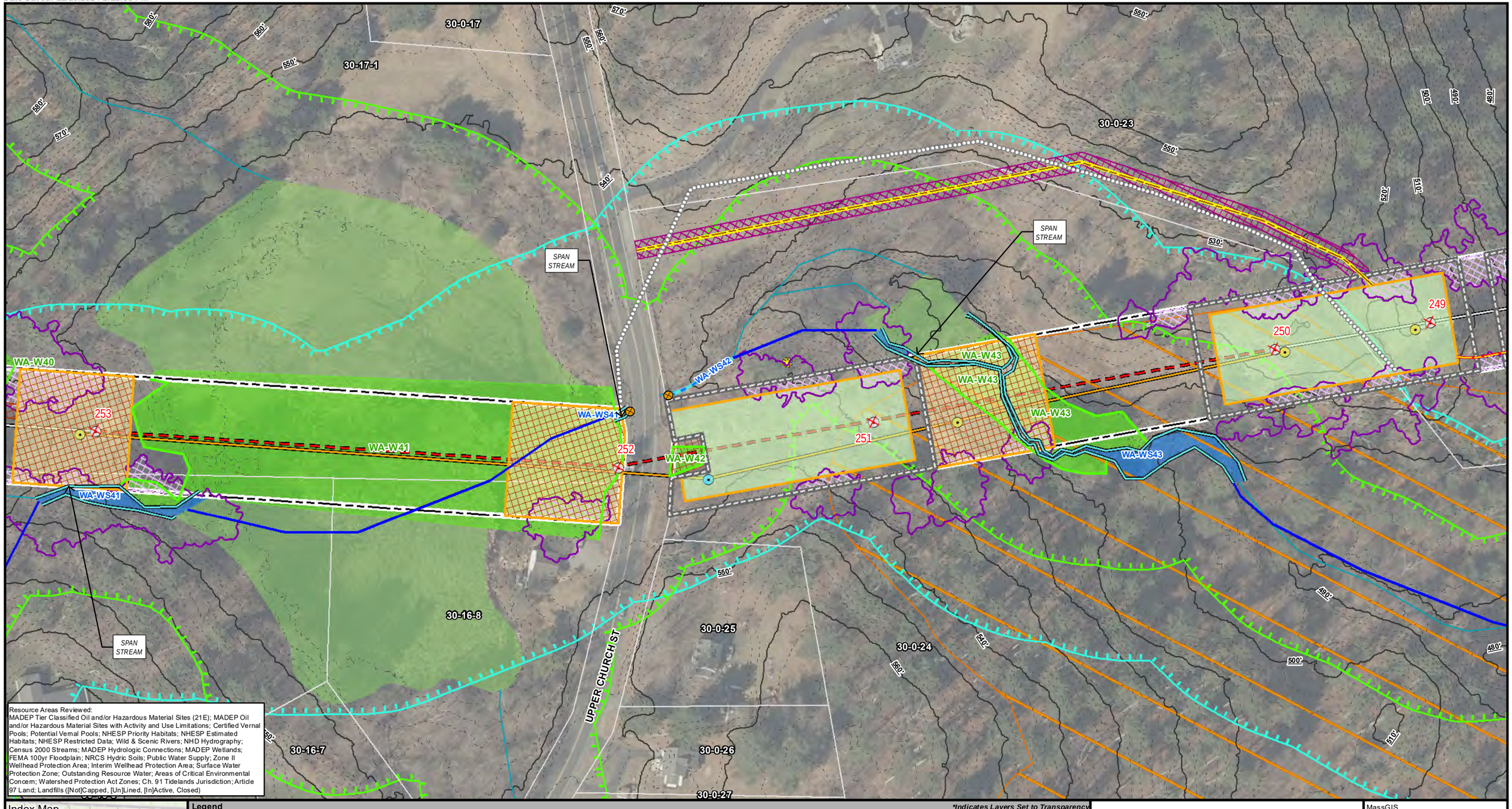

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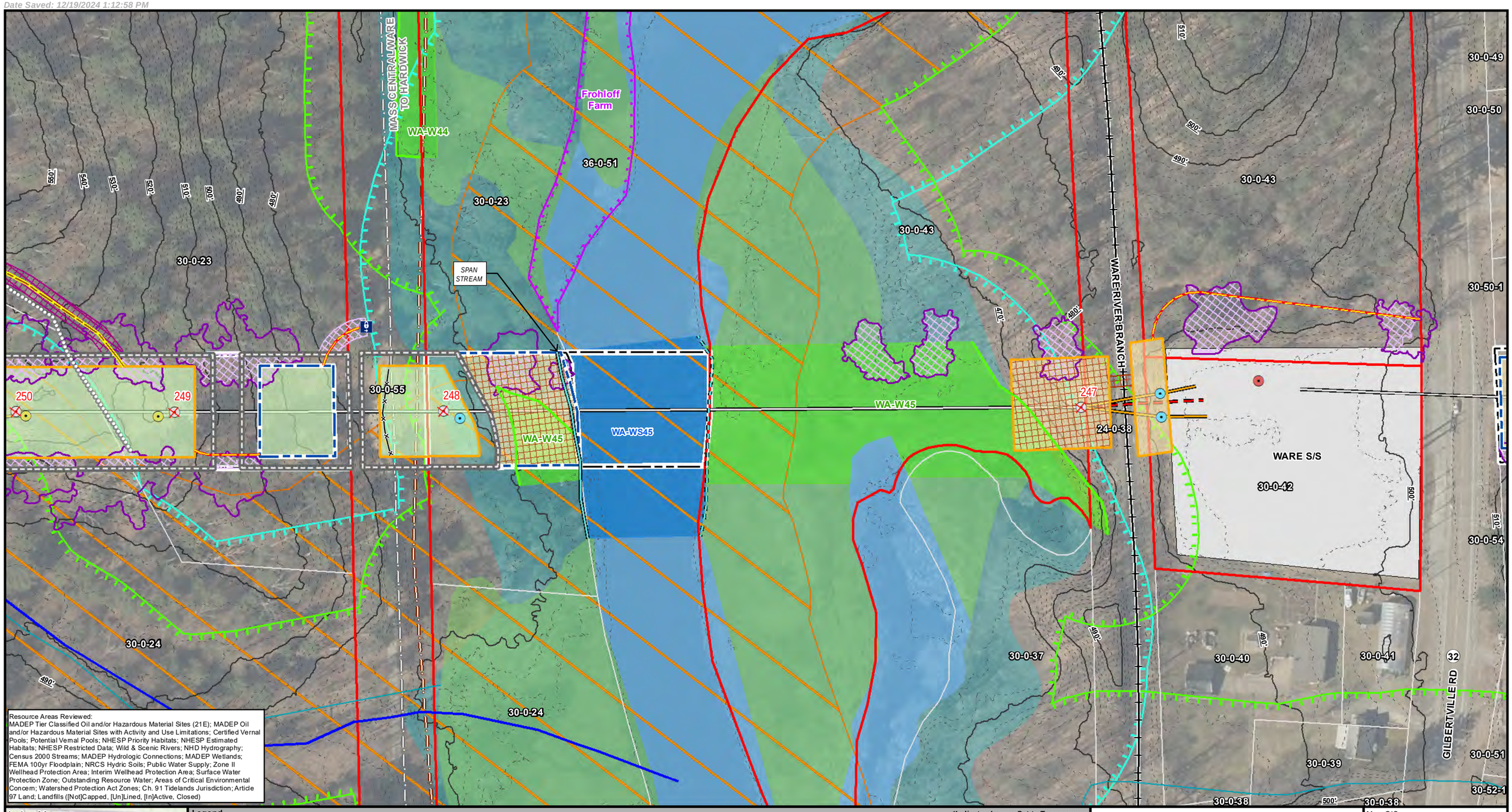

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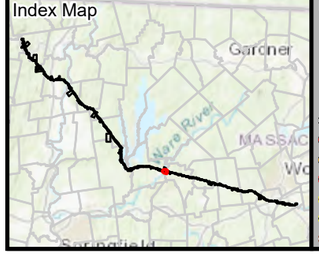

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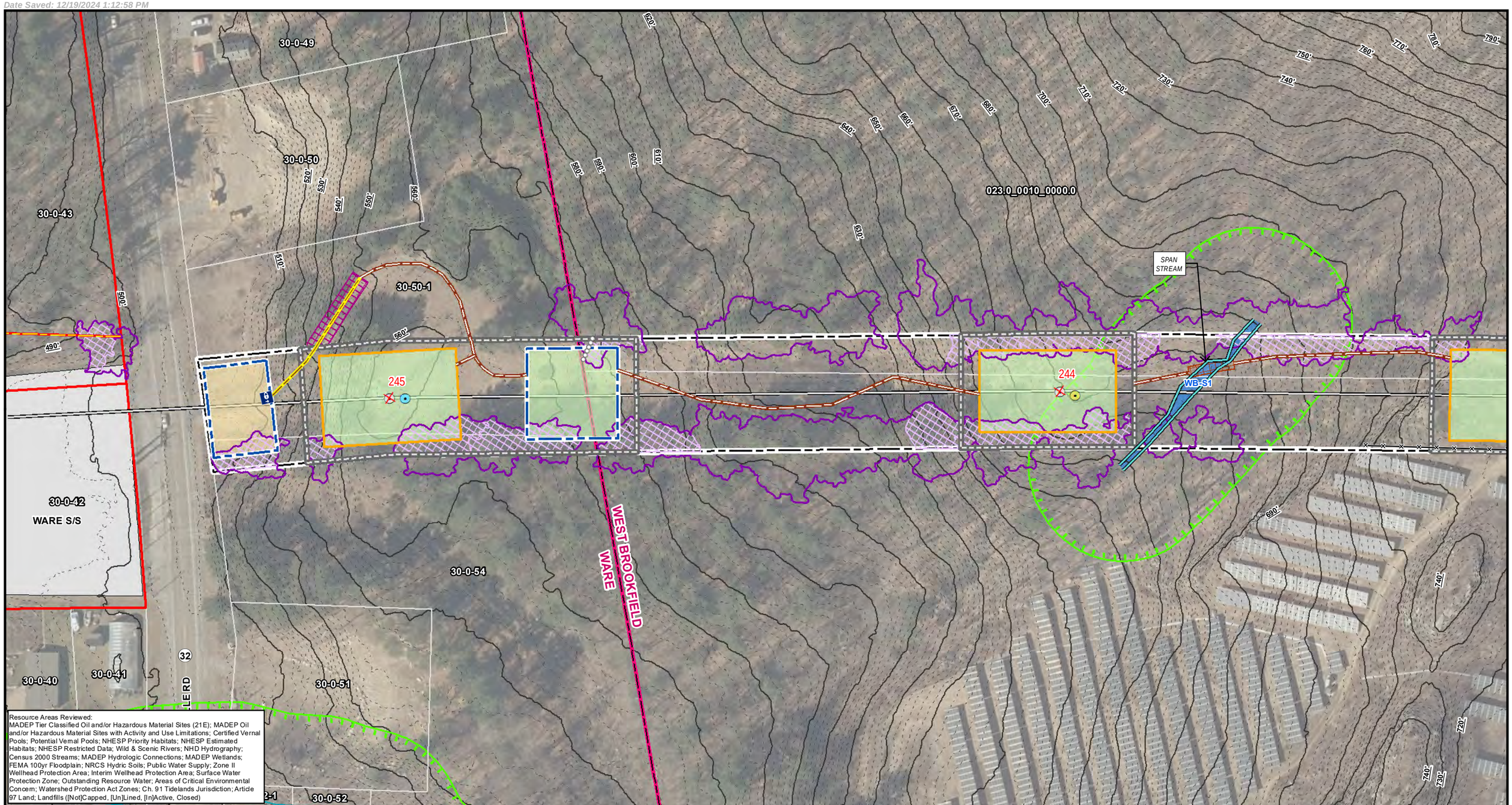

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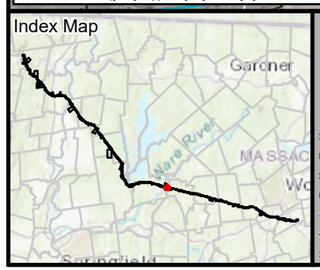

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Ware & West Brookfield, MA

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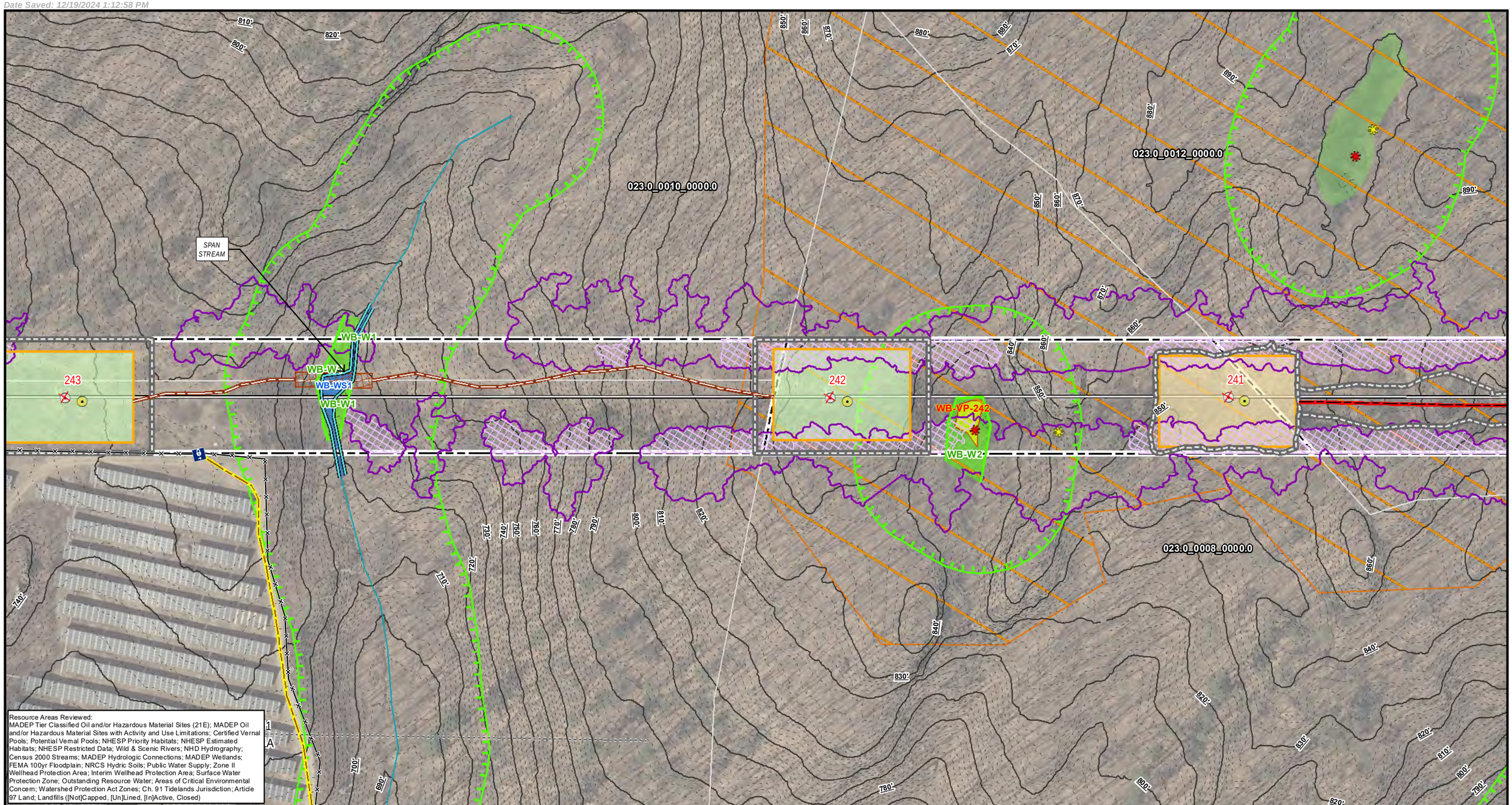

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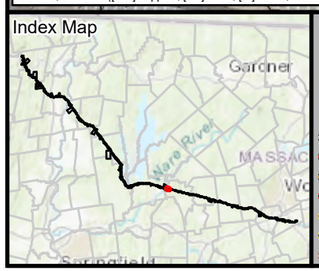

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

West Brookfield, MA

MassGIS
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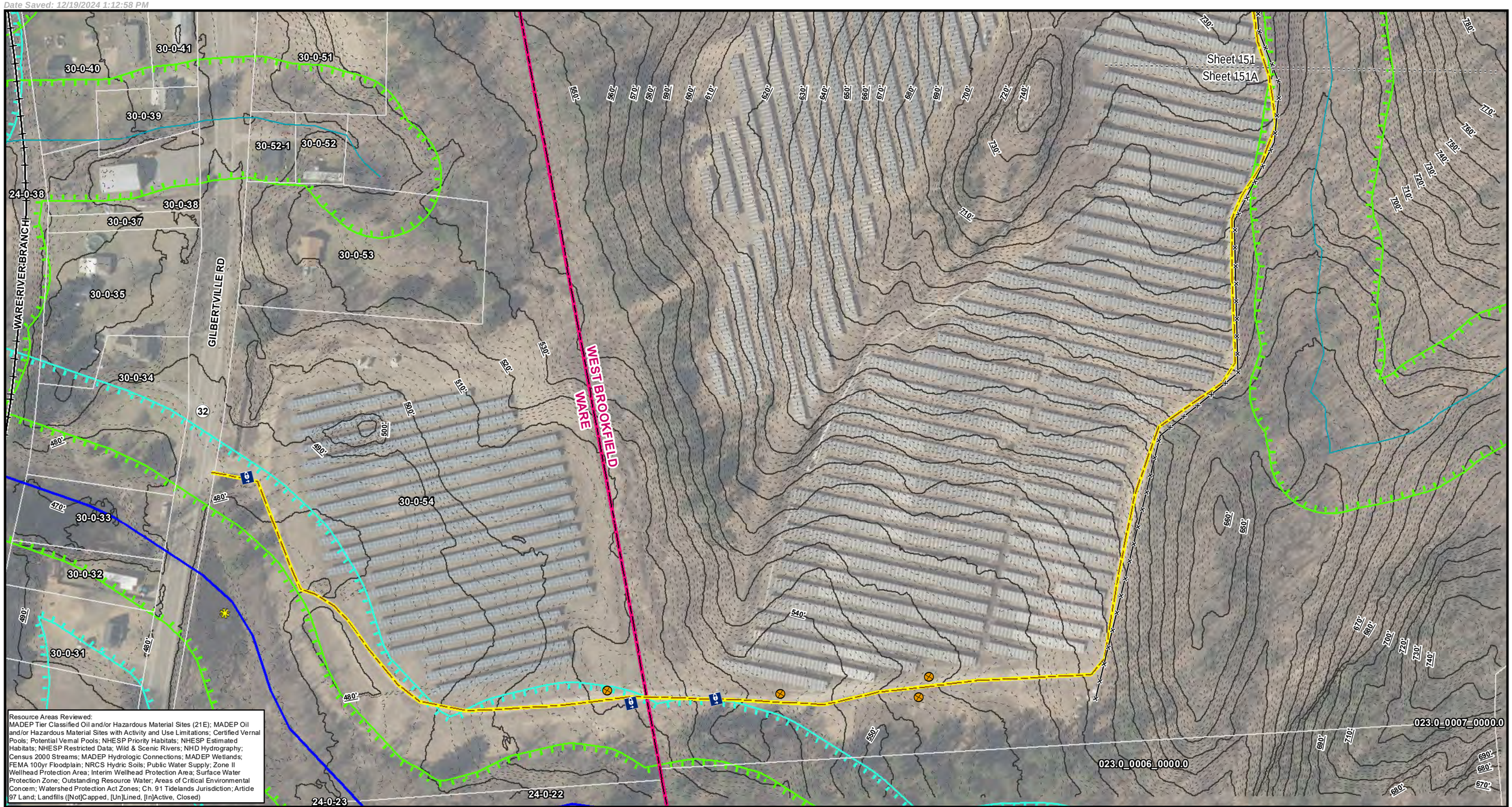

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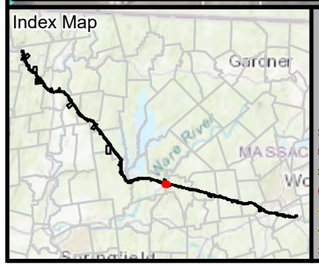

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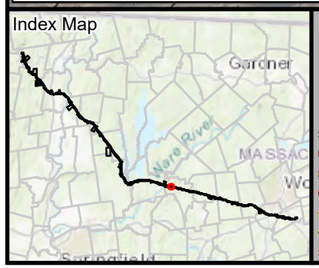

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Article 97 Lands

- Private

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

West Brookfield, MA
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MassGIS
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Sheet 153

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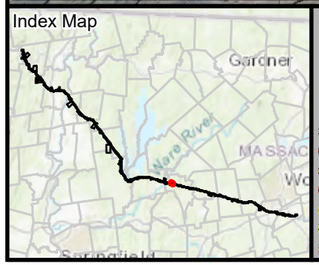

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WB-W10

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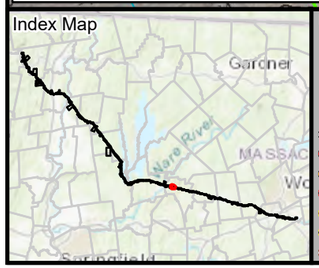

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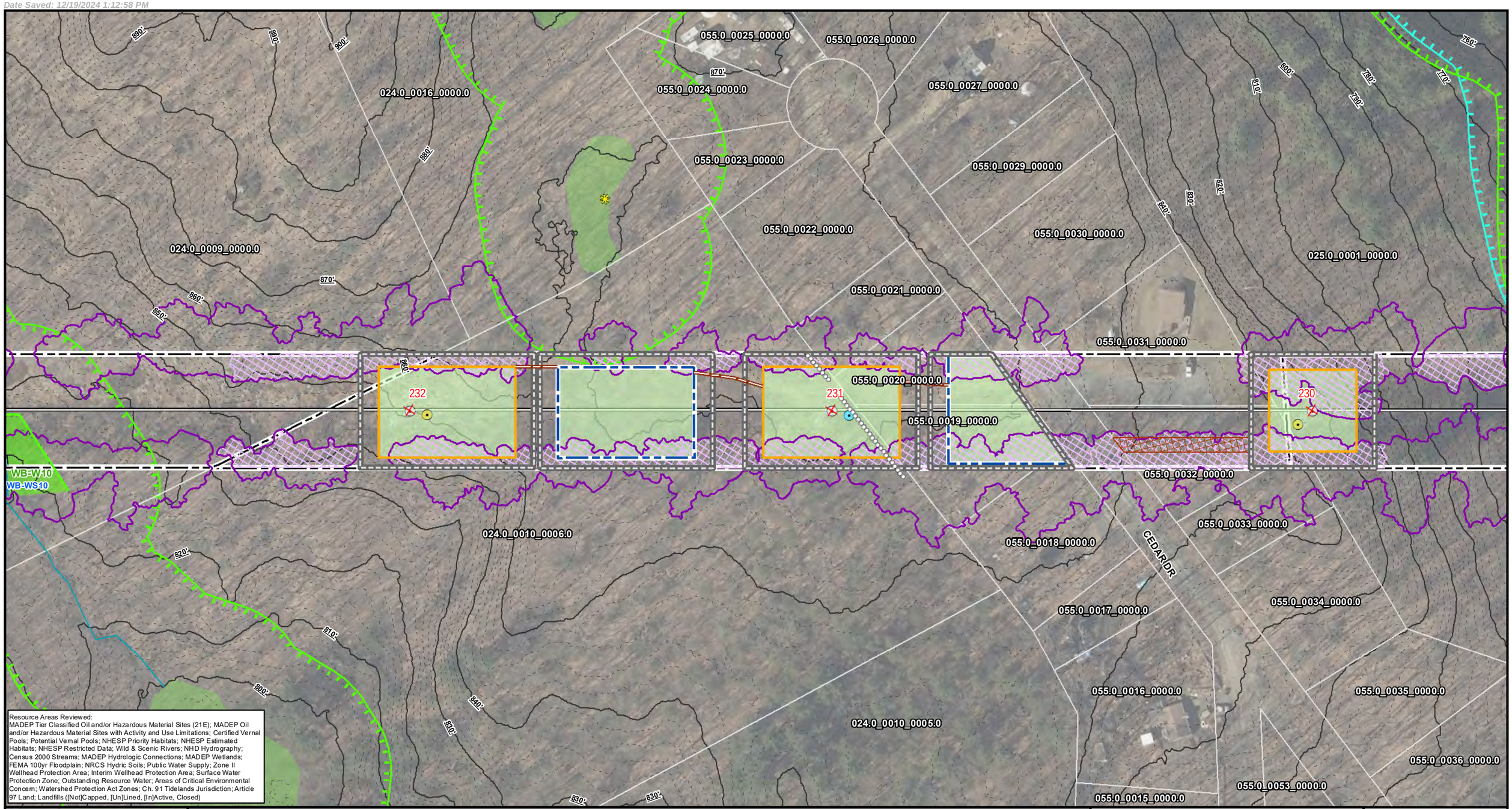

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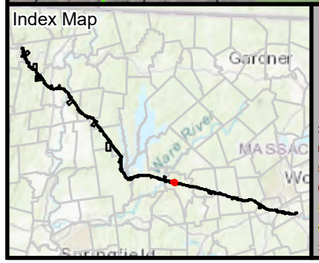

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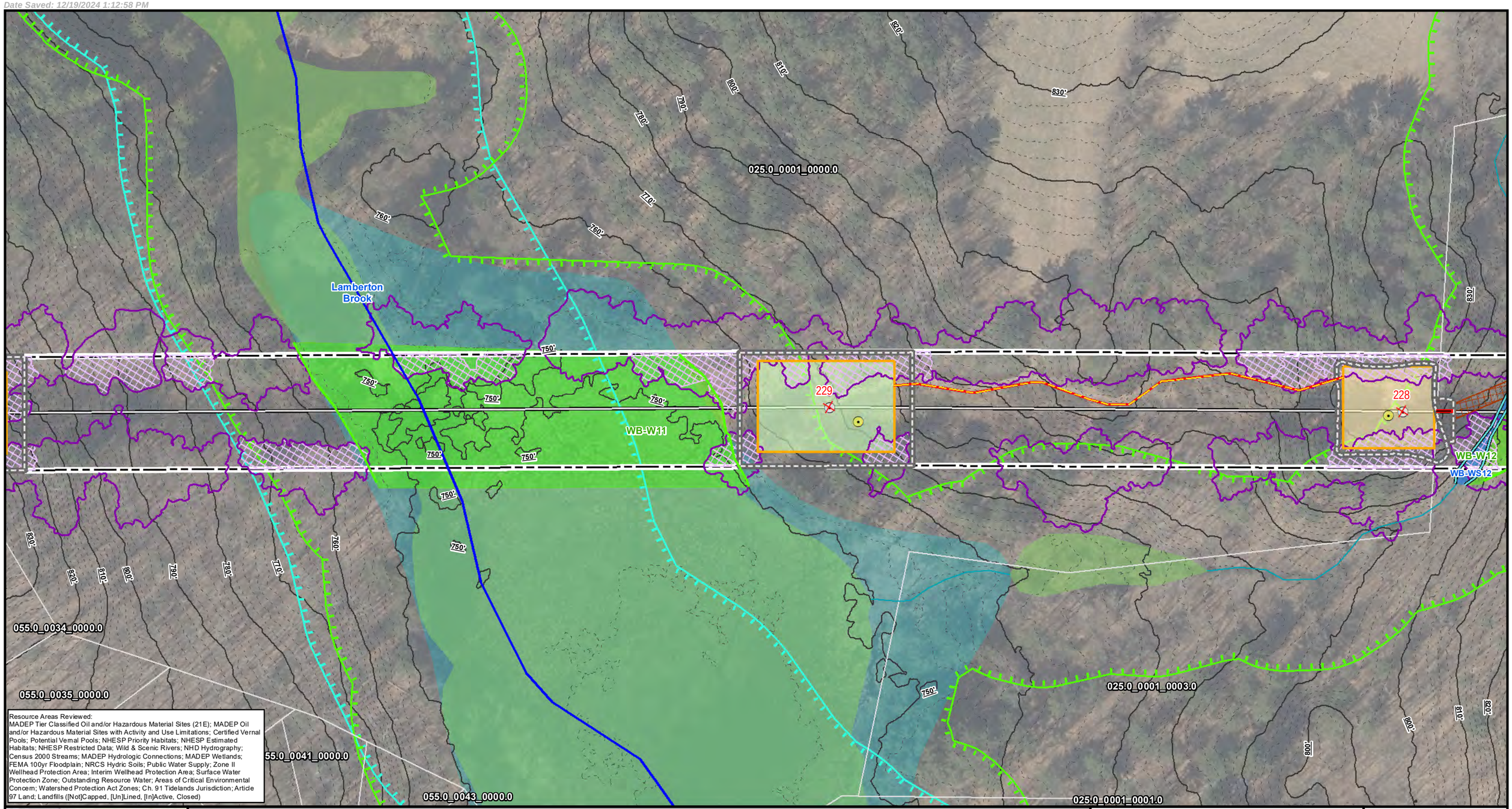

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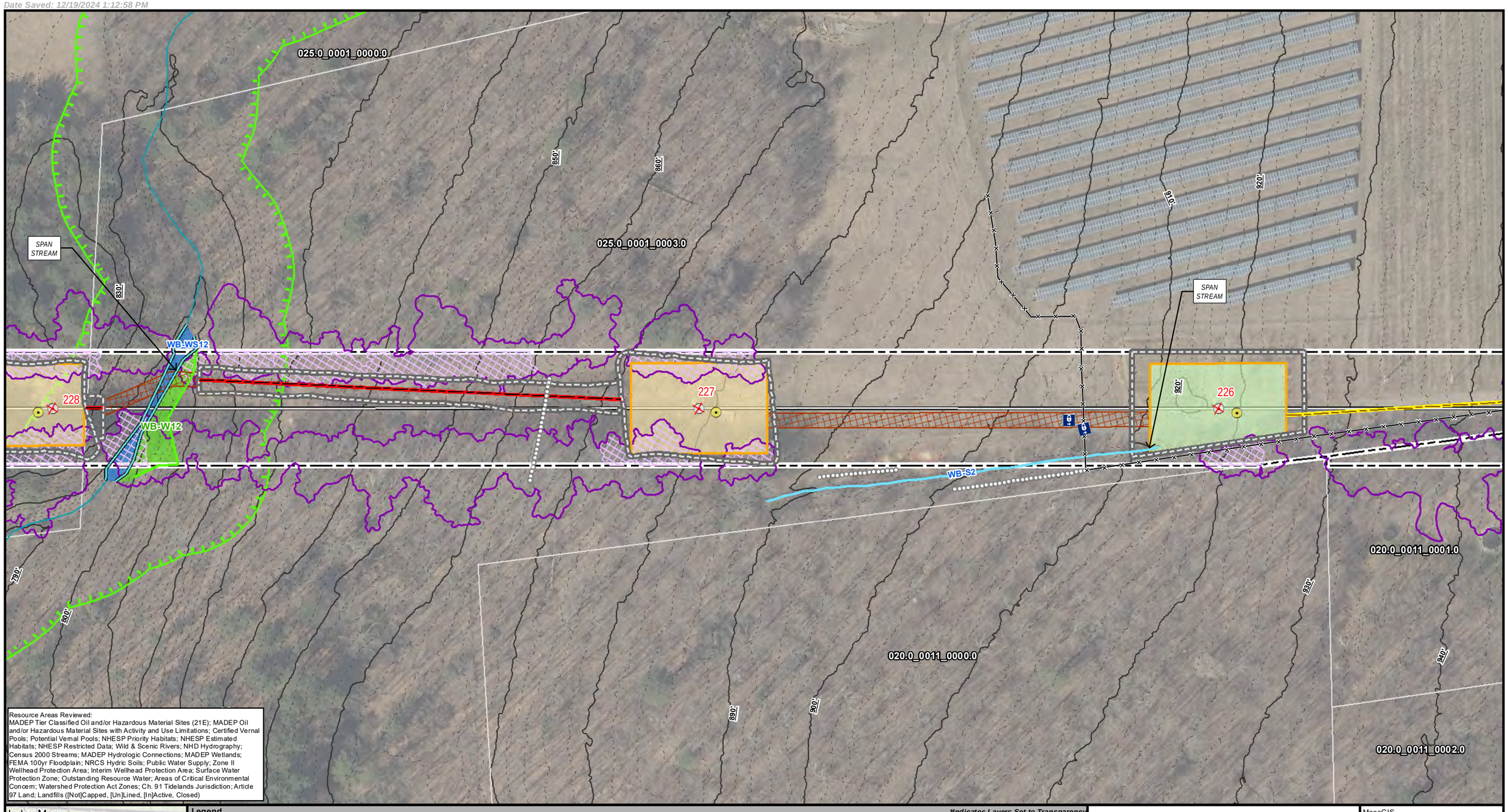

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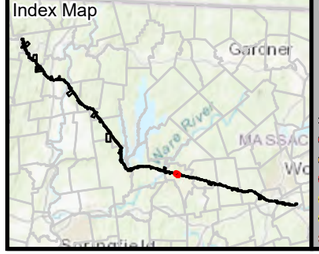

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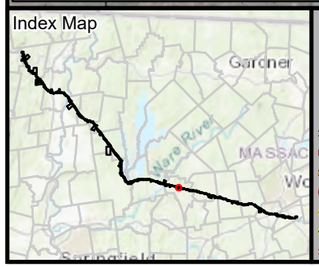

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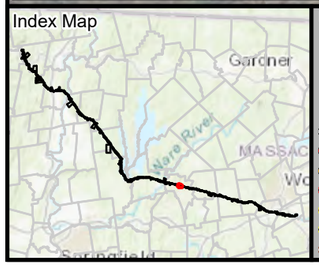

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1 inch = 100 feet
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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

West Brookfield, MA

MassGIS
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Sheet 160A
Sheet 160

WB-W15
WB-W16
WB-WS16
WB-VP-219
219
220
218
217
MADDEN RD
SHEA ROAD
Mill Brook

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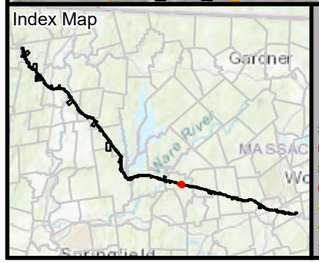

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640'
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660'
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650'
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WB-WS16
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WB-W16
WB-W16
WB-VP-219
Sheet 160A
Sheet 160
620'
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SHEA ROAD
021.0_0012_0000.0
219
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217
020.0_0034_0000.0
026.0_0005_0002.0
SHEARD
620'
620'
620'
021.0_0014_0001.0
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Article 97 Lands

- Dept. of Fish & Game

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

West Brookfield, MA
Page 160A of 240

MassGIS
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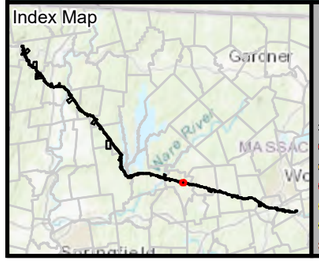

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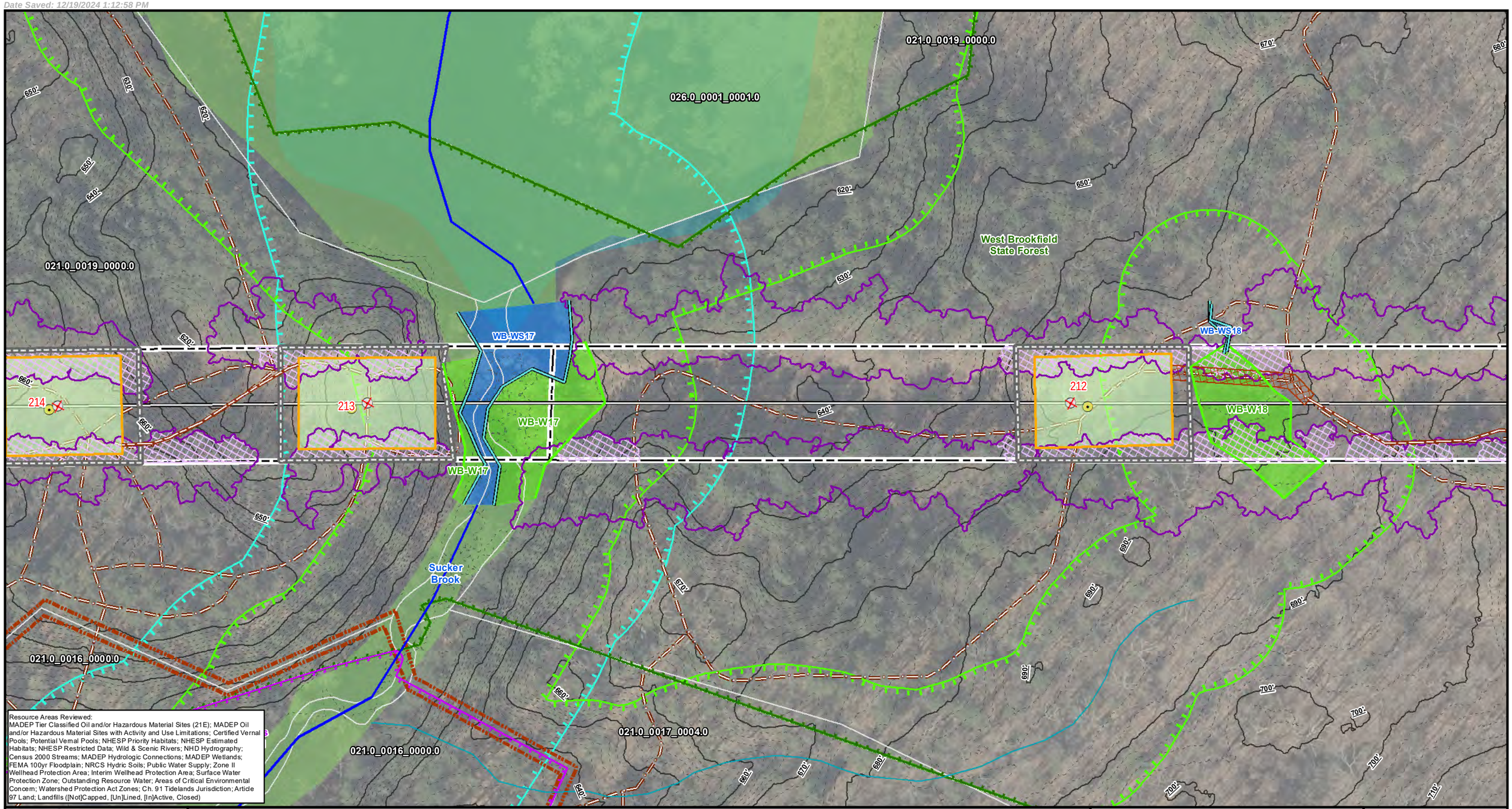

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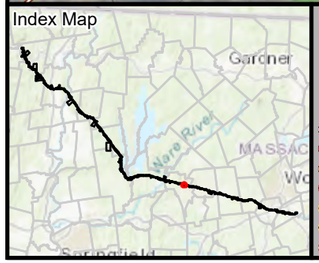

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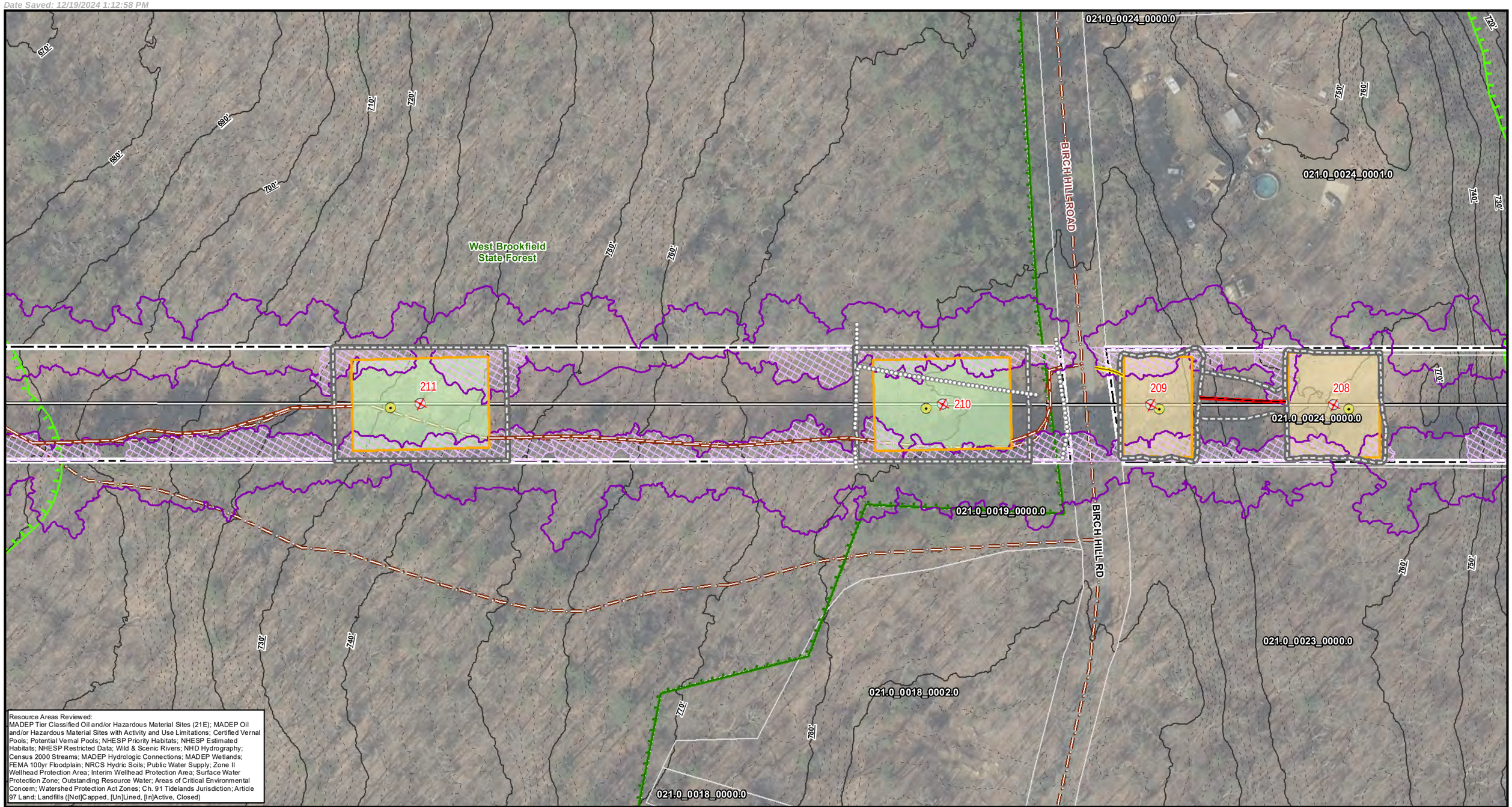

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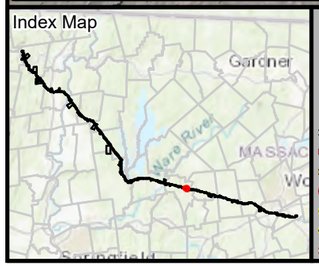

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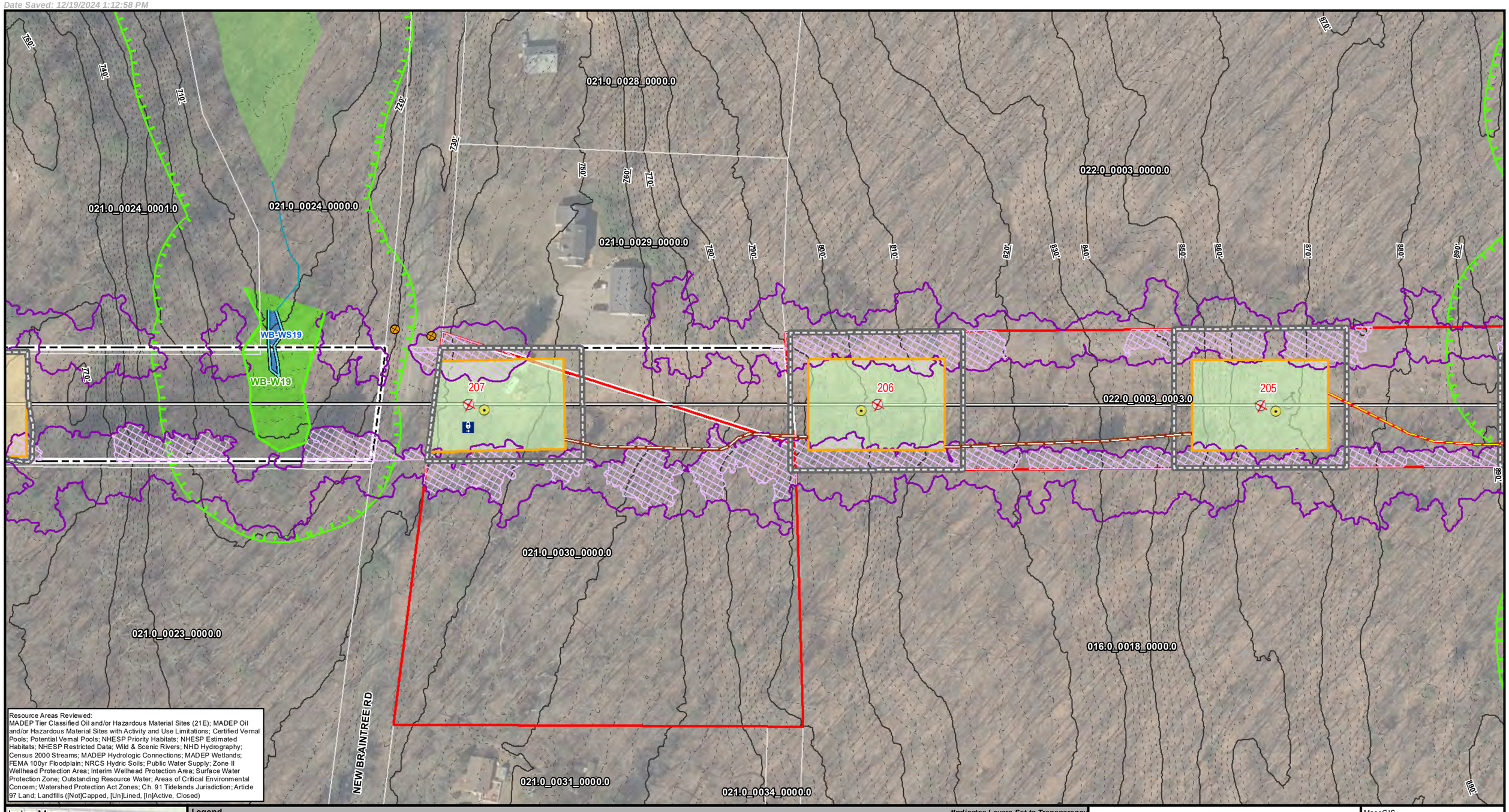

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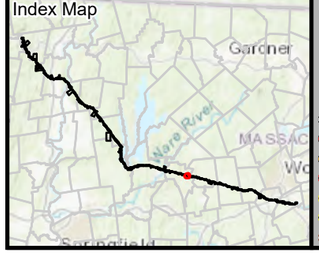

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- Guardrail
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- Selective Tree Removal
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1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

West Brookfield, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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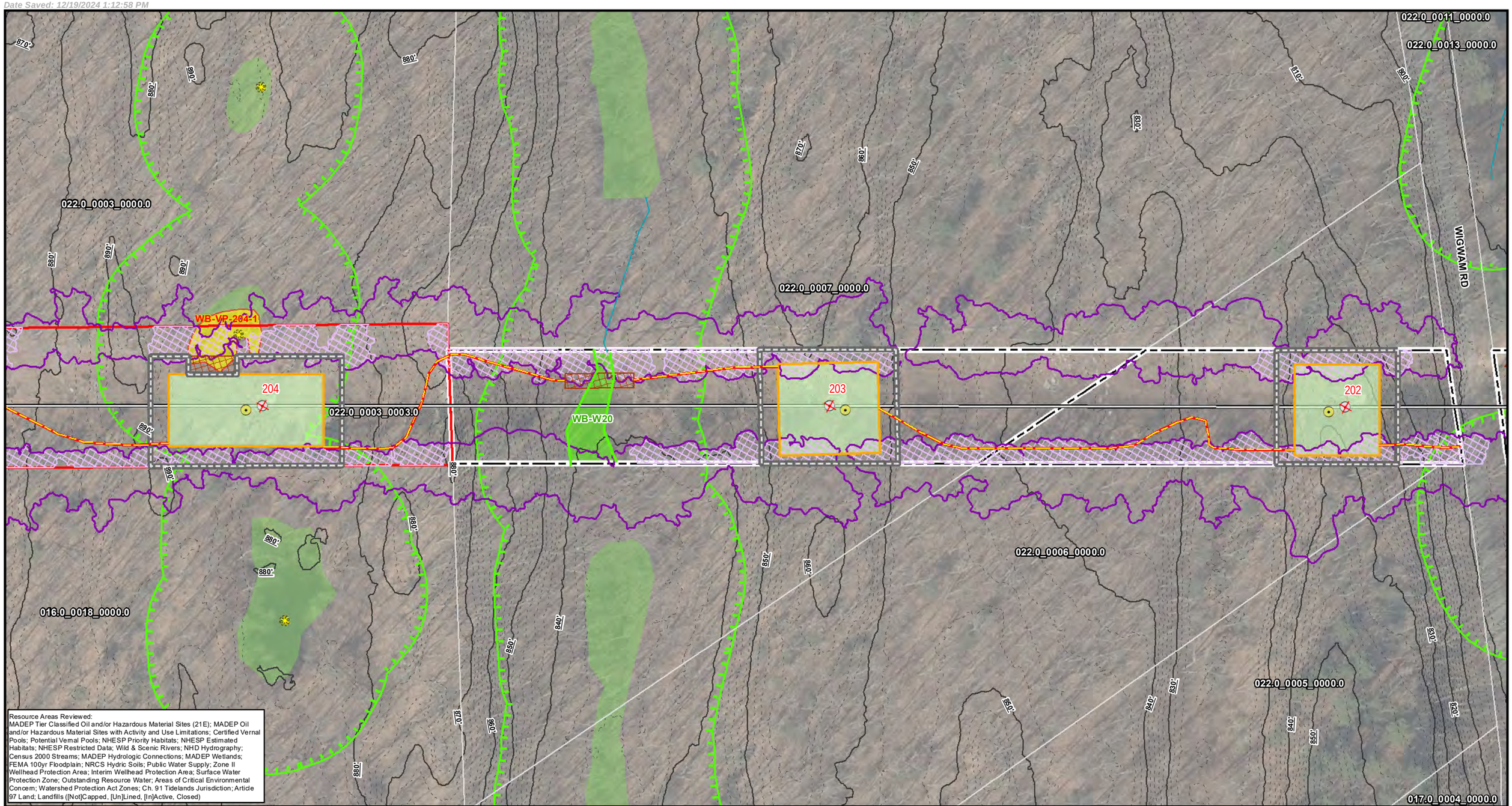

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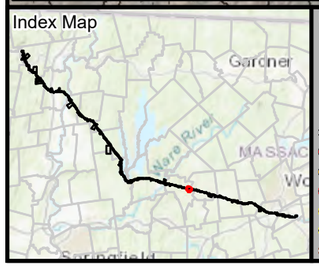

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MILLBROOK CIR
WB-W21
WB-W22
201
200
740'
750'
760'
770'
780'
790'
800'
810'
820'

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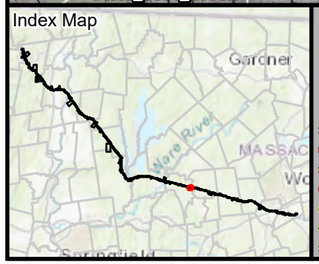

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Environmental Resources Map

West Brookfield, MA

MassGIS
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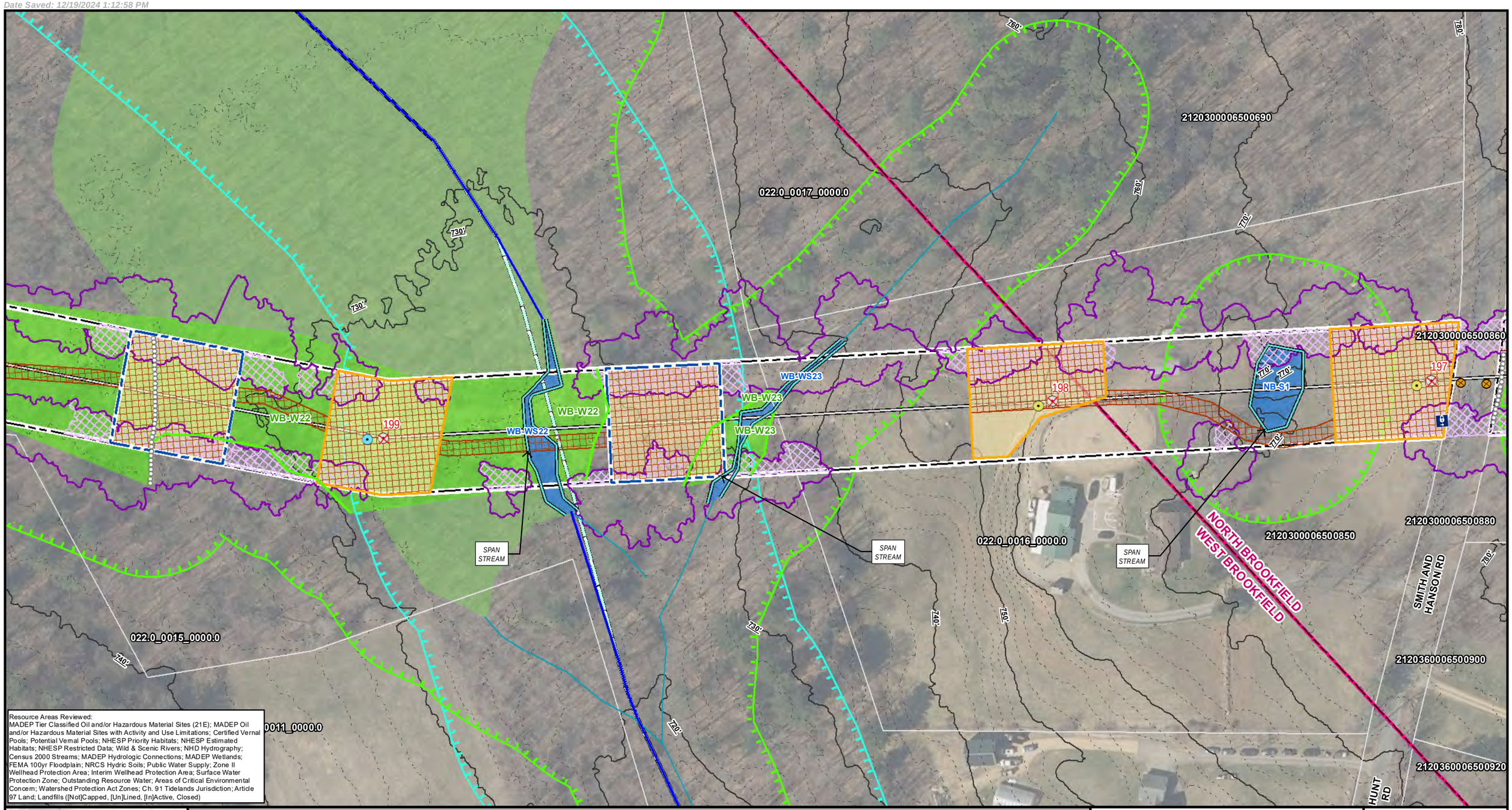

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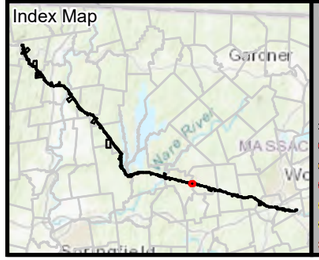

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

West Brookfield & North Brookfield, MA

MassGIS
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SMITH AND HANSON RD
NB-W1
NB-WS1
197
196
195
850'
840'
830'
820'
810'
800'
790'
780'
770'
760'
750'
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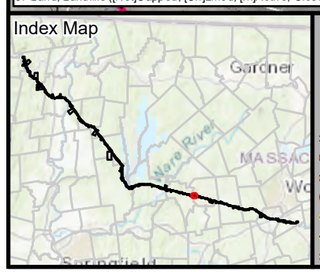

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

North Brookfield, MA

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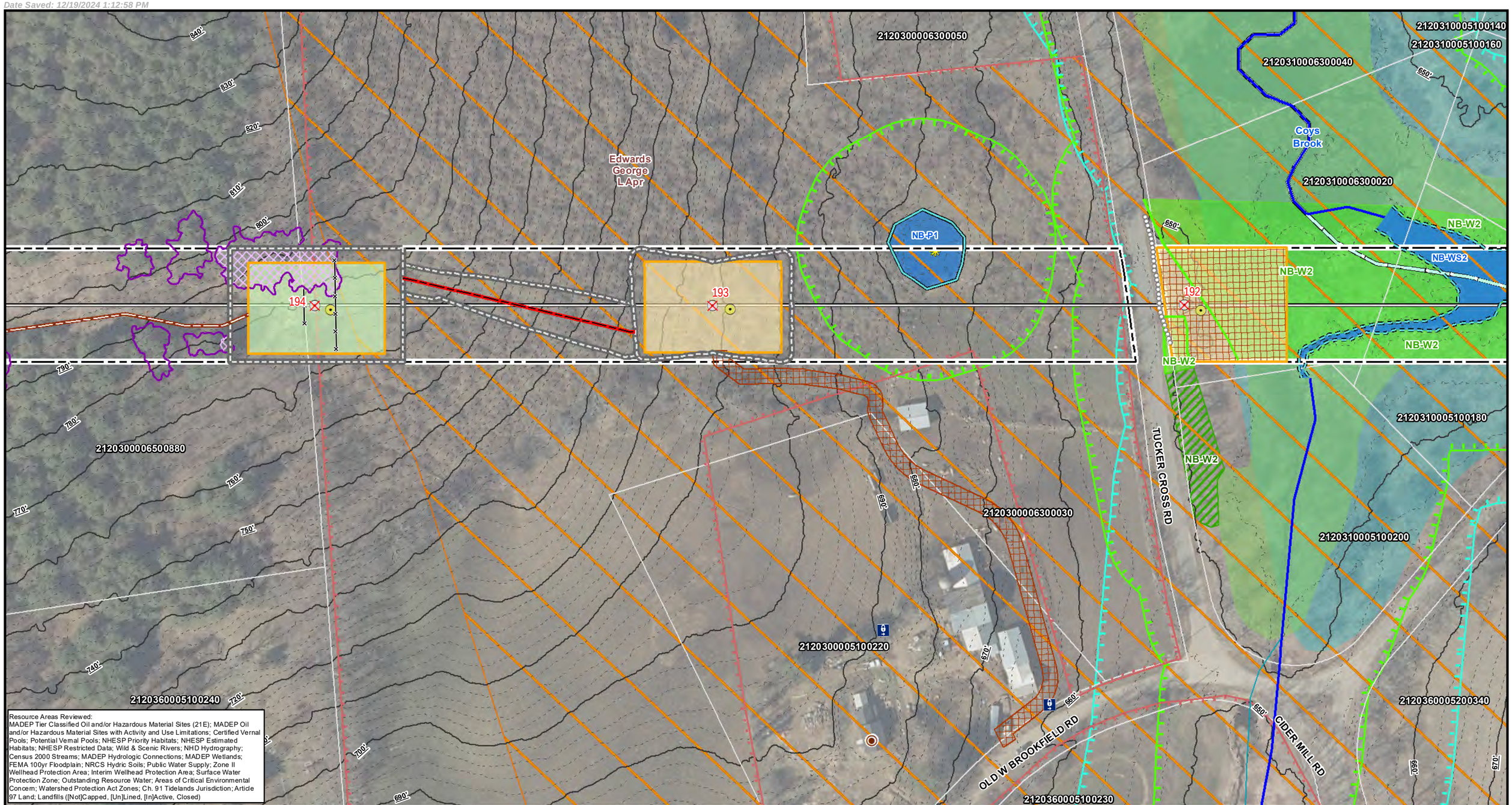

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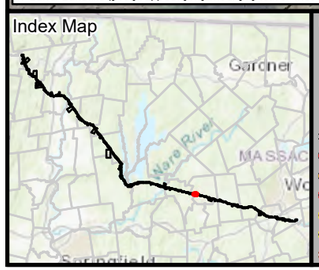

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- Private

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NB-WS2
NB-WS3
NB-W3
191
190
189
SPAN STREAM
SPAN STREAM
OLD W BROOKFIELD RD
Coys Brook
650'
640'

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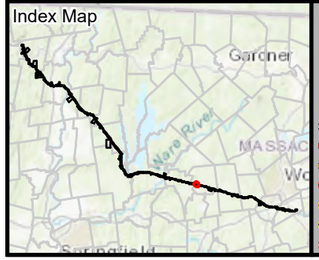

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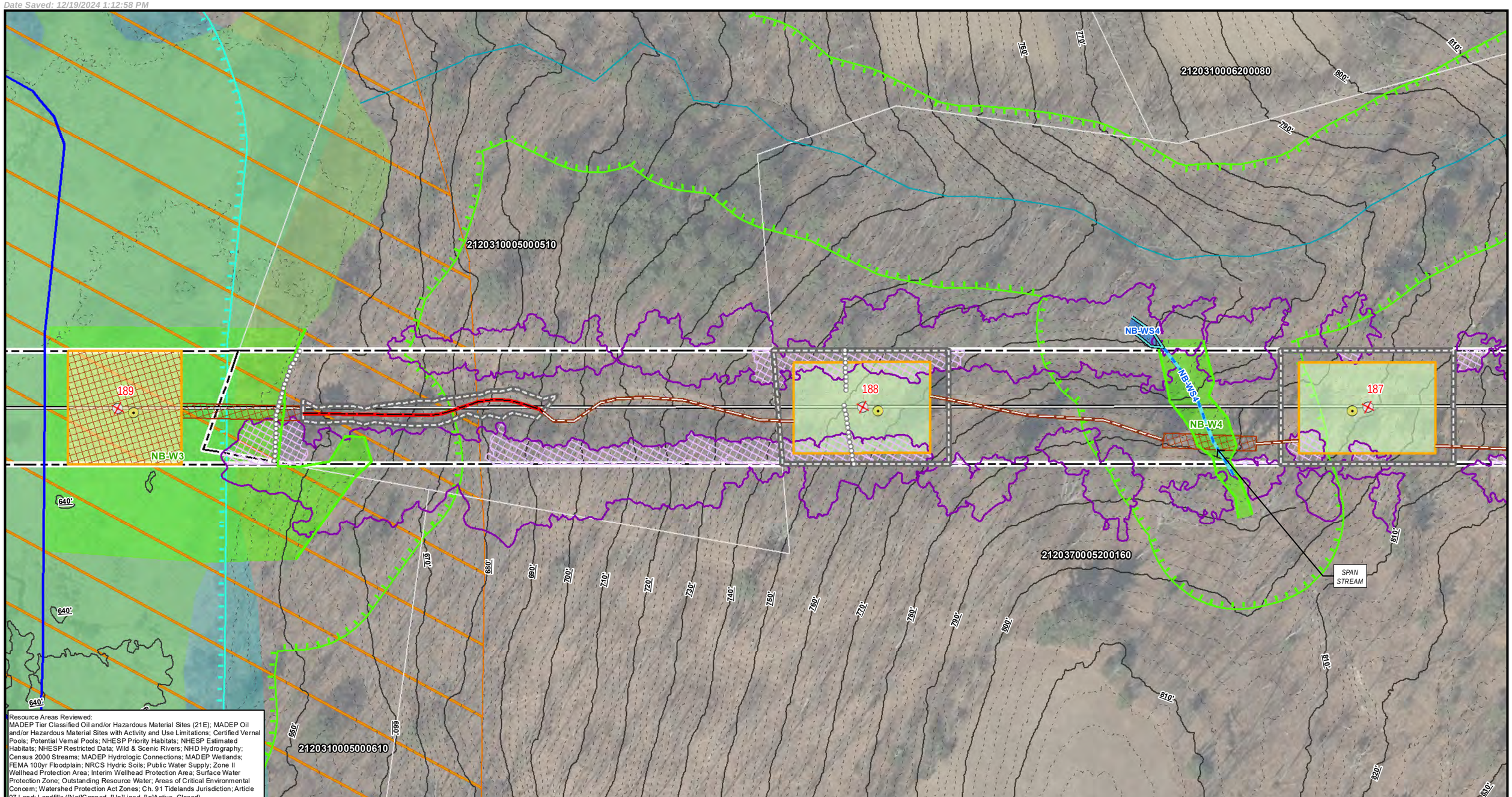

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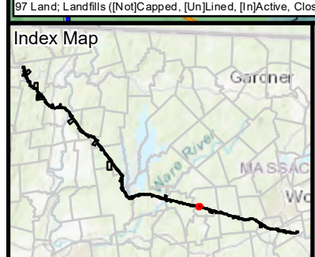
Index Map



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- Selective Tree Removal
- Pruning
- Town Boundary
- Parcel Boundaries

N

1 inch = 100 feet

0 50 100

Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

North Brookfield, MA
Page 171 of 240

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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2120310006200080
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MC CARTHY RD
2120370000100050
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W BROOKFIELD RD
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North Brookfield Town Forest
67
2120370005500020
148
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NB-W5
186
185
184
2120370000100200
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Ware River
MASSAC
Springfield

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Article 97 Lands

- Municipal
- Land Trust

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

North Brookfield, MA

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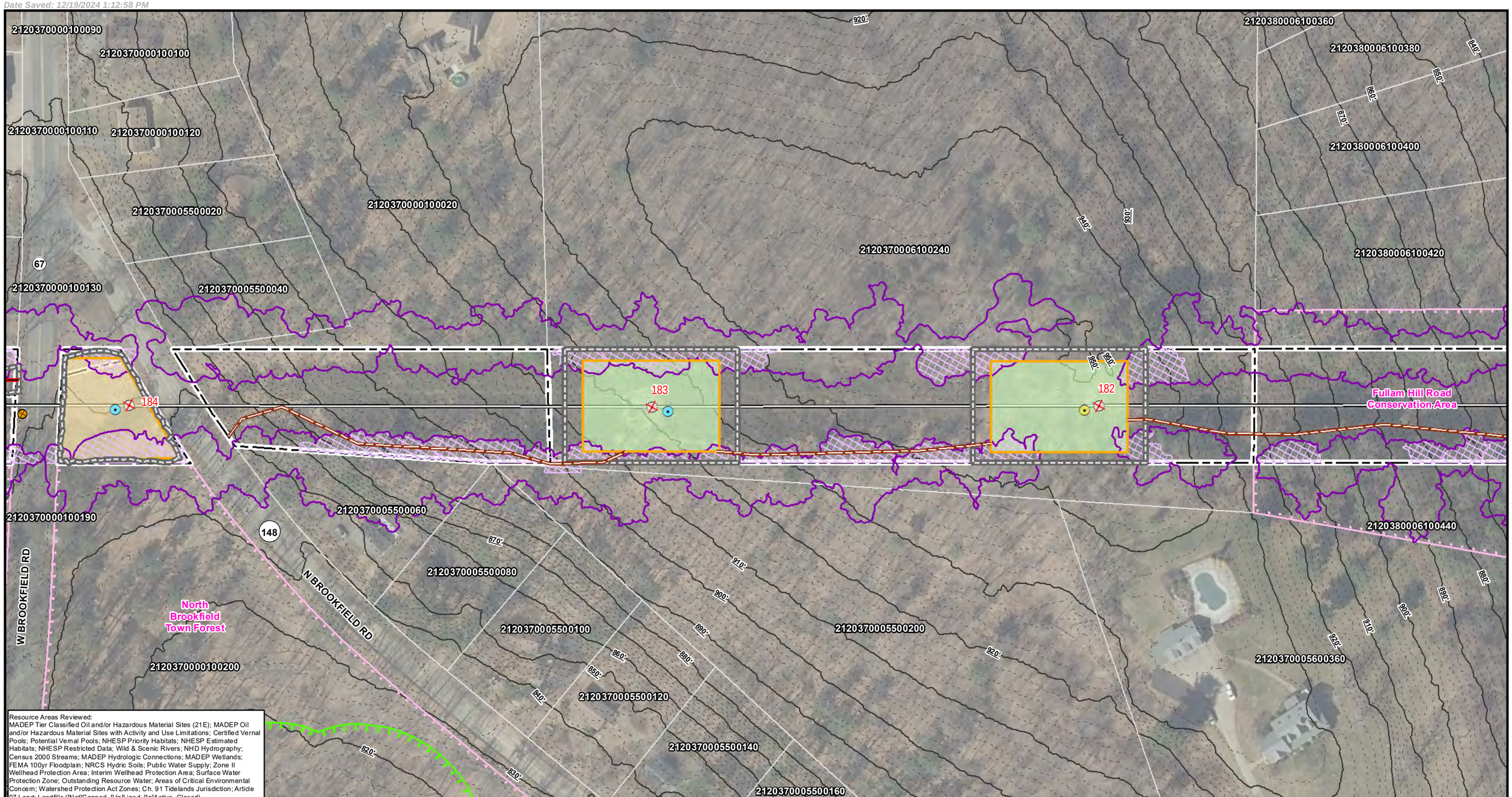

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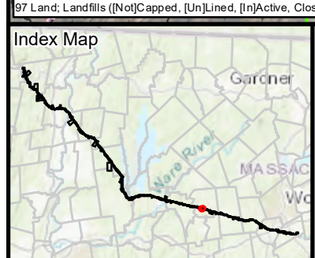

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- Municipal

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0 50 100

Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

North Brookfield, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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2120380006100380
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Donovan Road Conservation Area
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720'
730'
181
NB-W6
180
179
Fullam Hill Road Conservation Area
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FULLAM HILL RD
750'
740'
730'
2120380006100490
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770'
780'
790'
800'
810'
820'
830'
840'
850'
860'
920'
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2120380005600480
760'

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- Parcel Boundaries

Article 97 Lands

- Municipal

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

North Brookfield, MA

MassGIS
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Forget-me-not Brook
E BROOKFIELD RD
SPAN STREAM
DONOVAN RD
Donovan Road Conservation Area
LASHAWAY S/S
NB-W7
NB-W8
NB-W9
NB-WS9
176
176A
176B
177A
177B
178
700'
710'
720'
730'
740'
750'
690'

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Springfield

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

North Brookfield, MA

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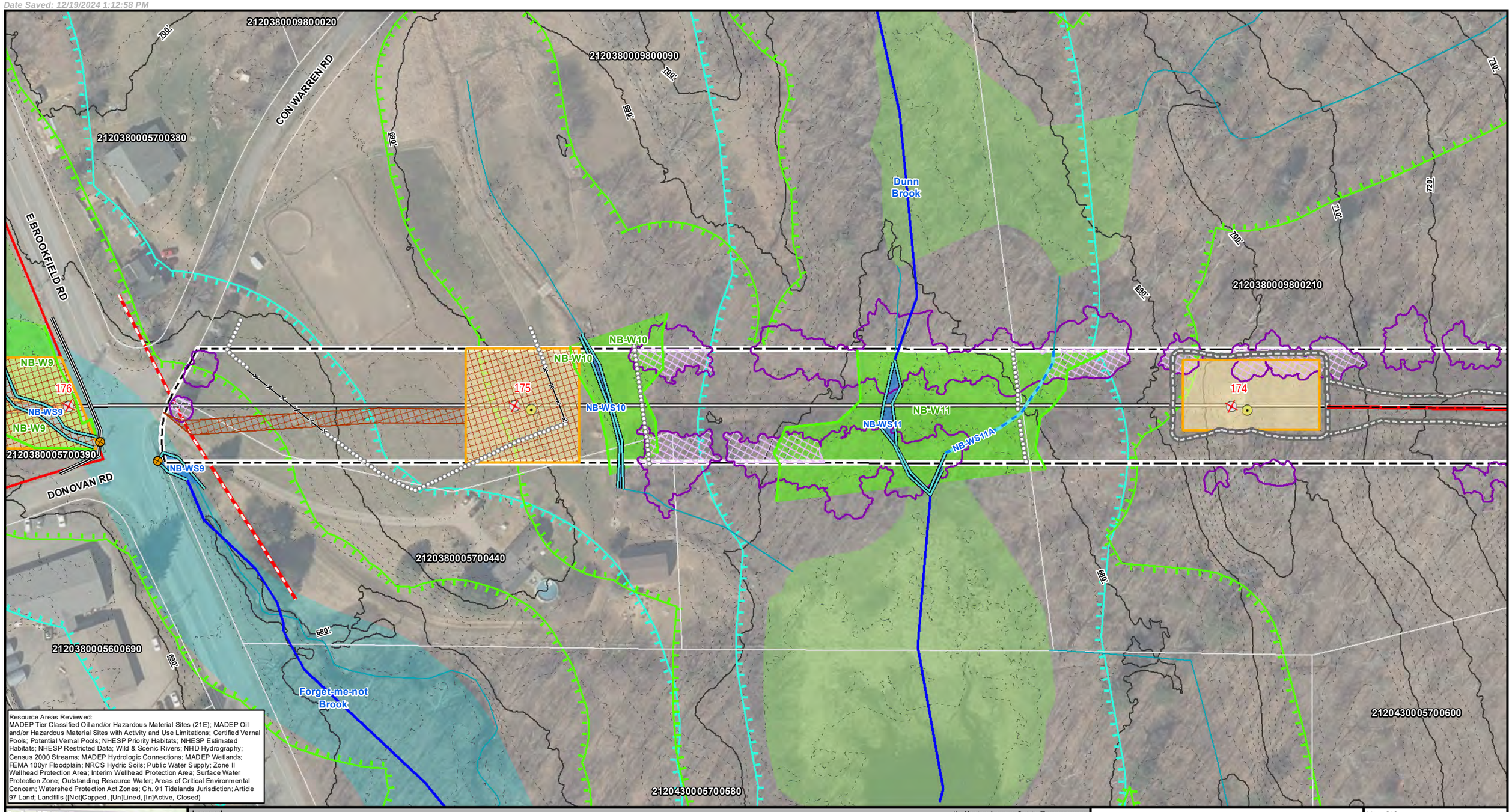

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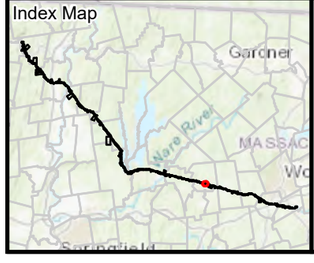

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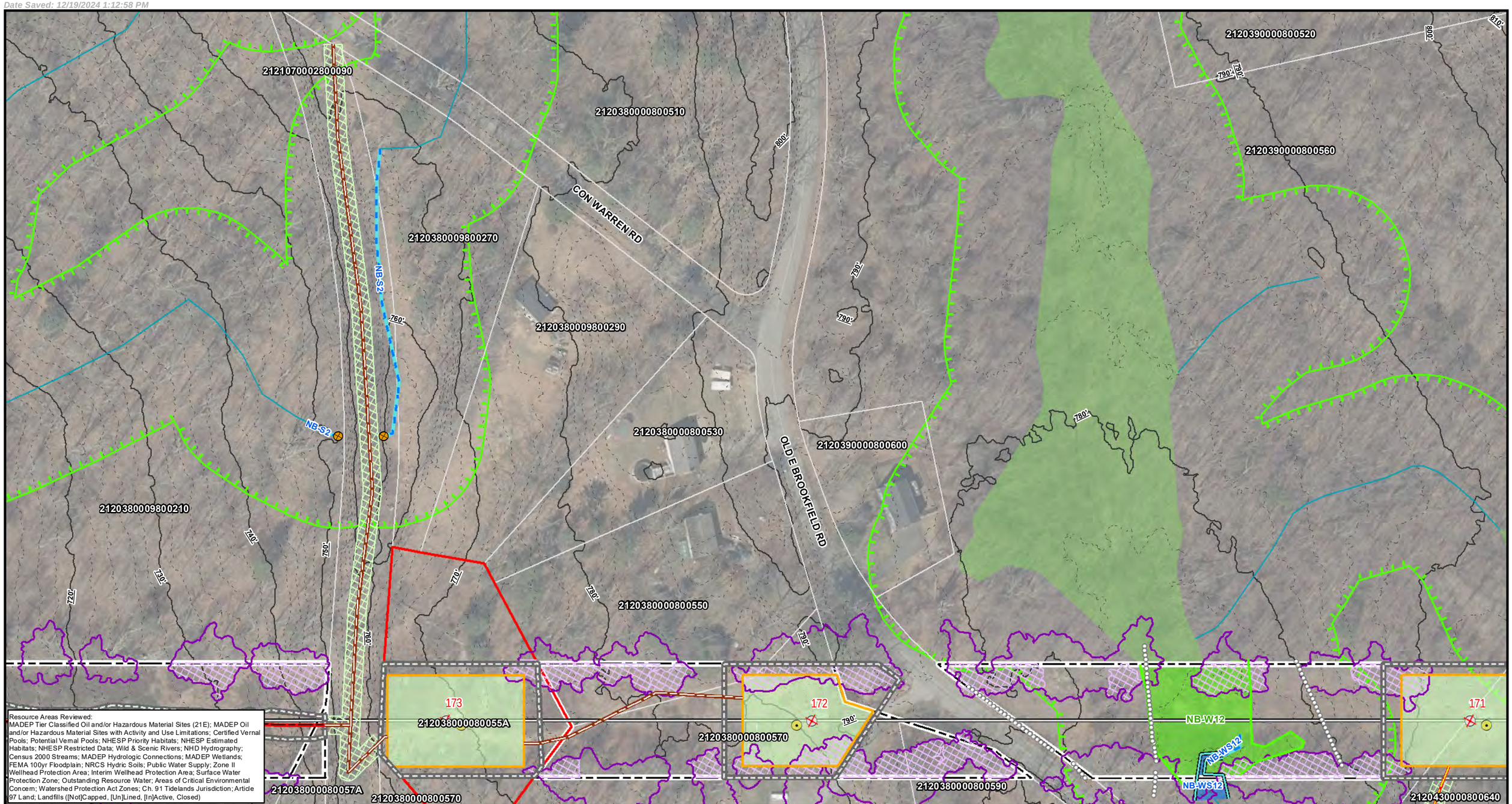

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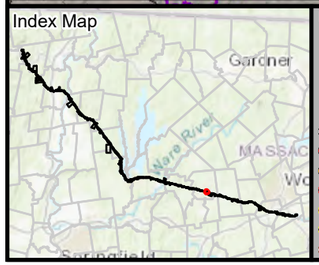

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*Indicates Layers Set to Transparency

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

North Brookfield, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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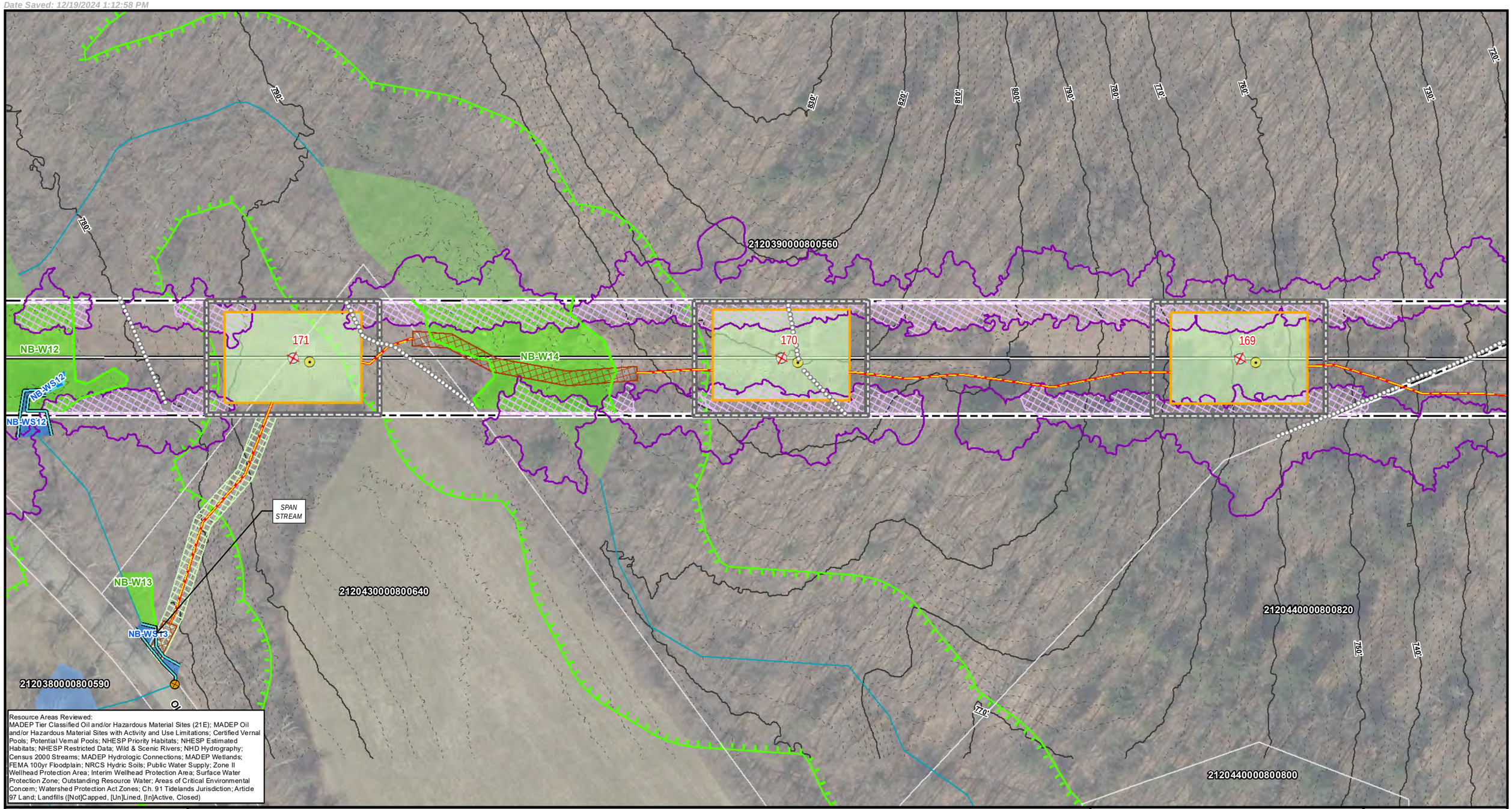

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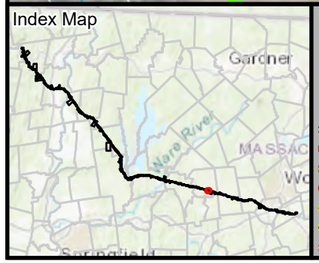

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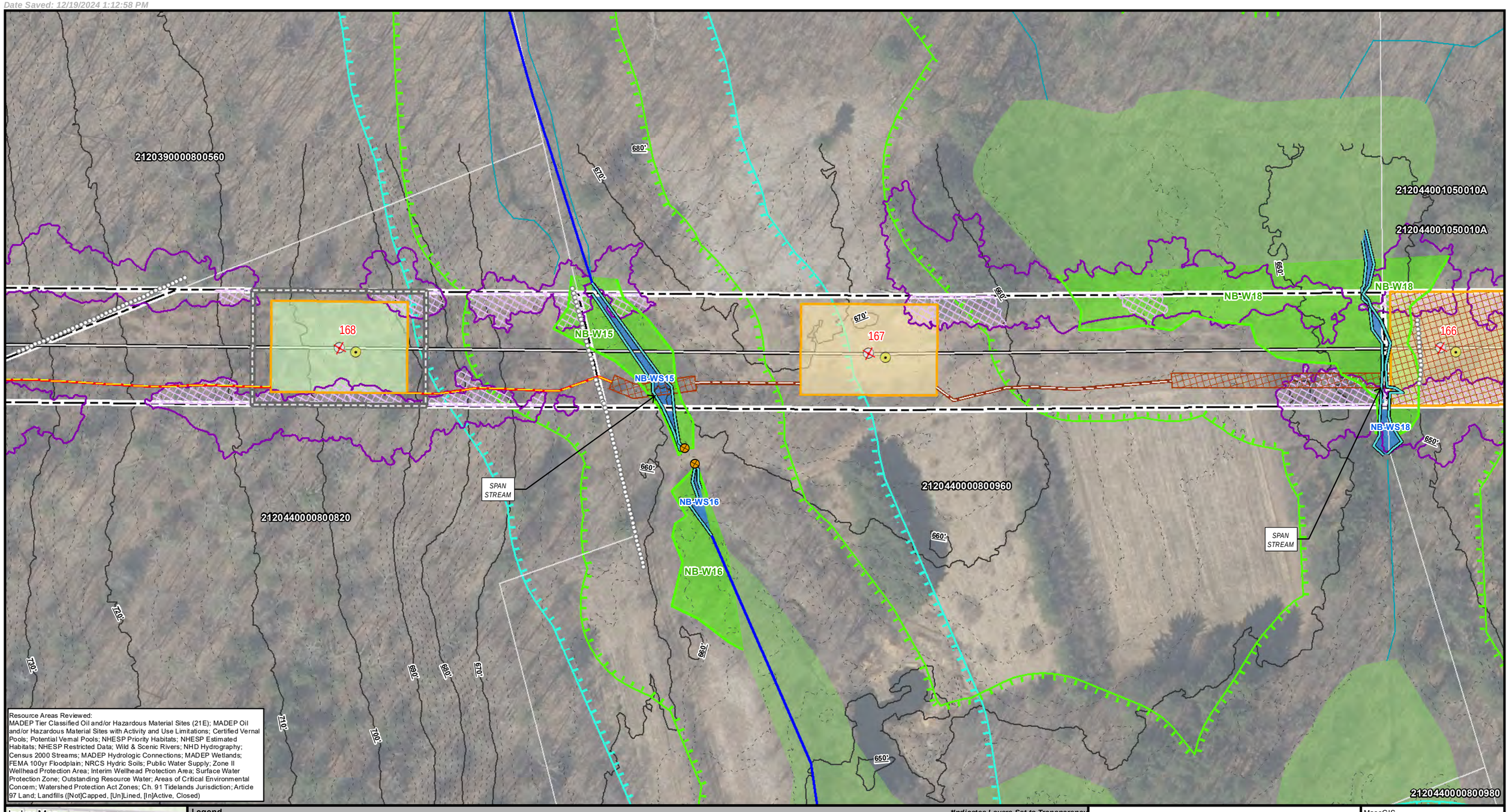

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Environmental Resources Map

North Brookfield, MA

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Gardner
Springfield

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

North Brookfield, MA
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MassGIS
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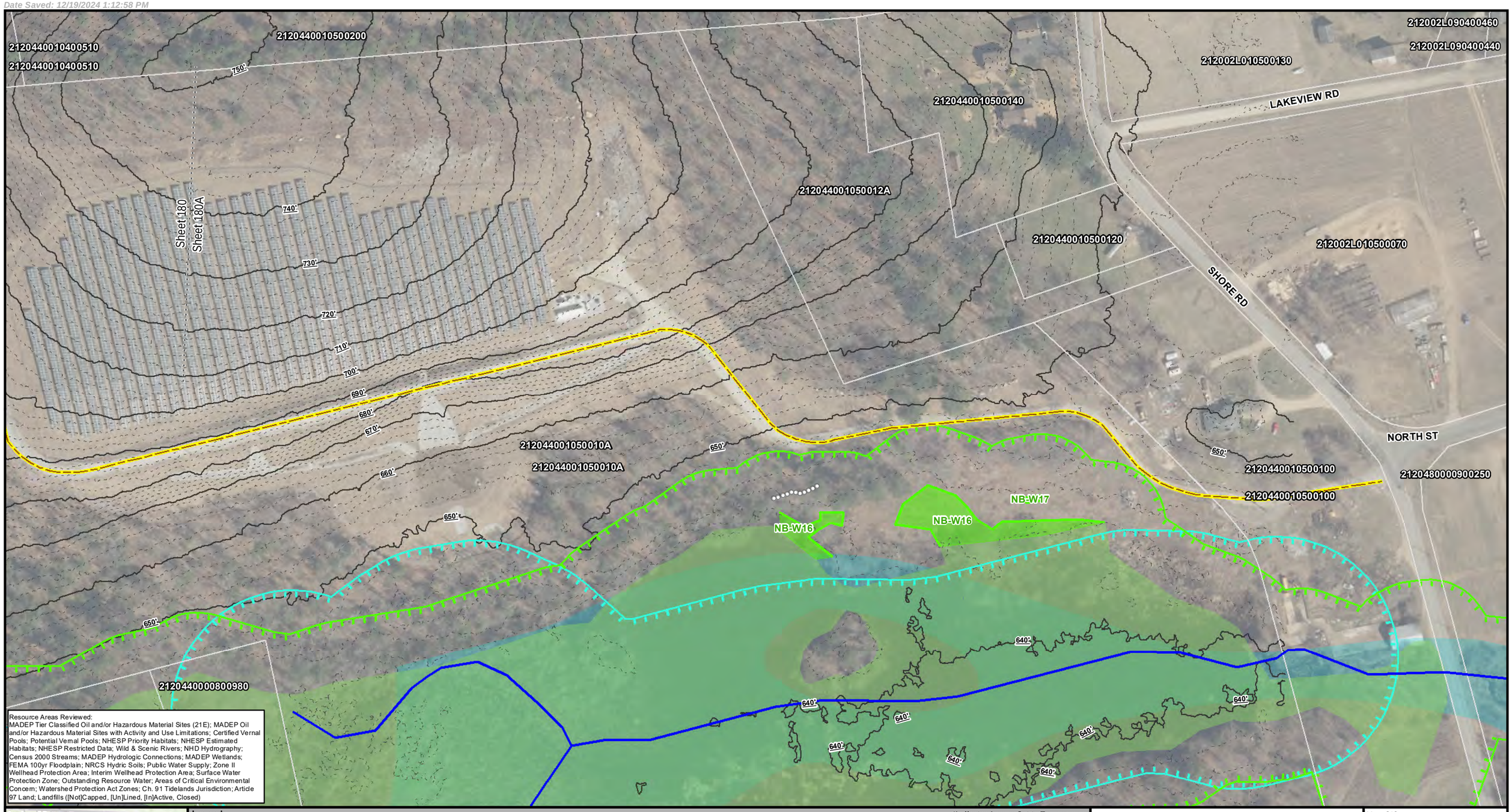

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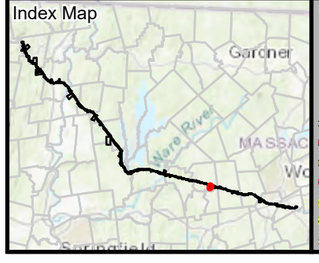

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1 inch = 150 feet
0 75 150
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

North Brookfield, MA
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MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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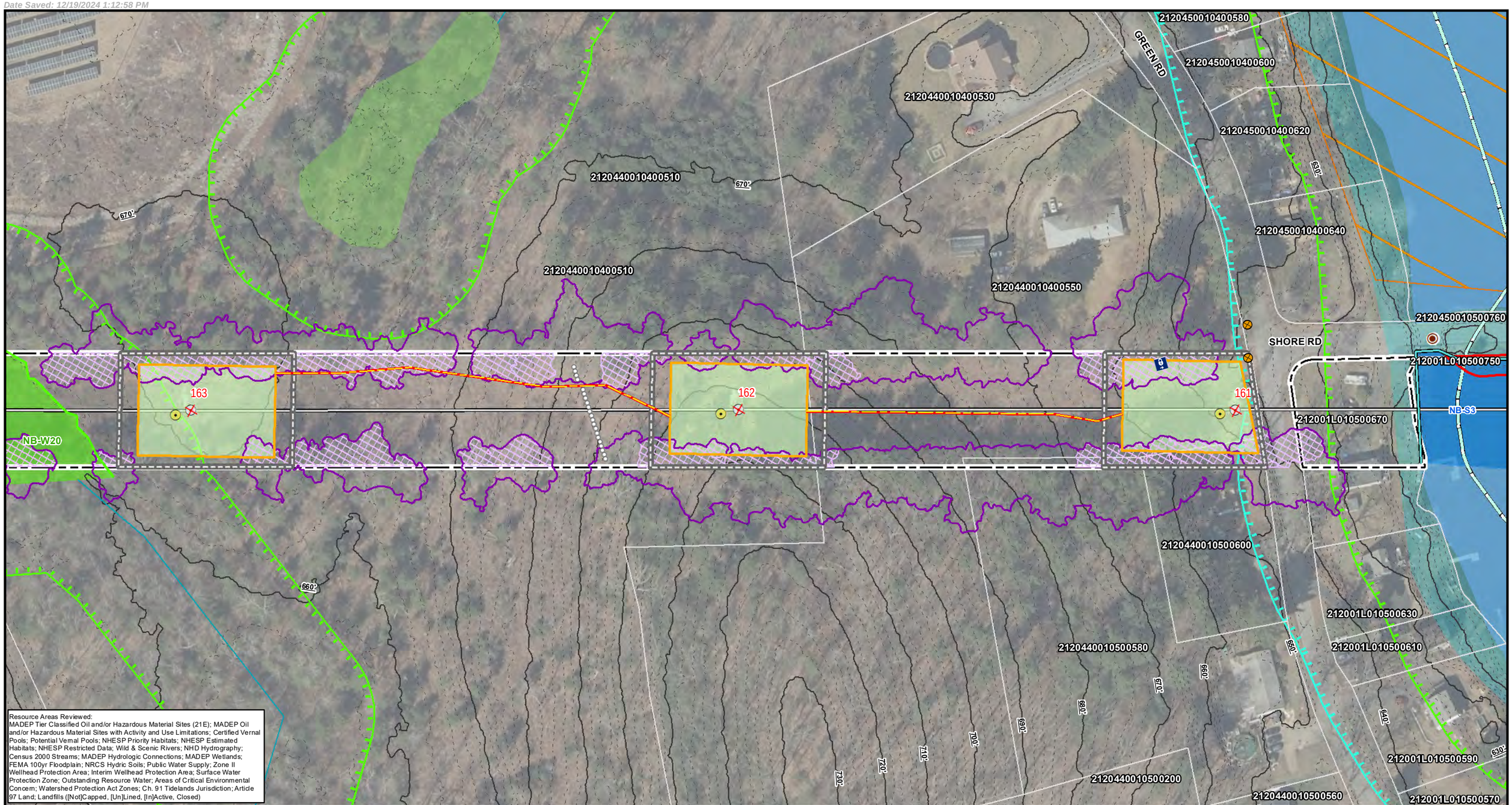

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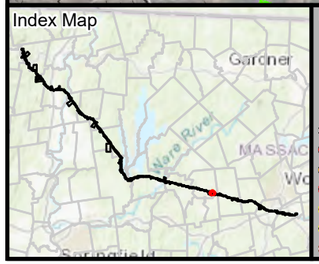

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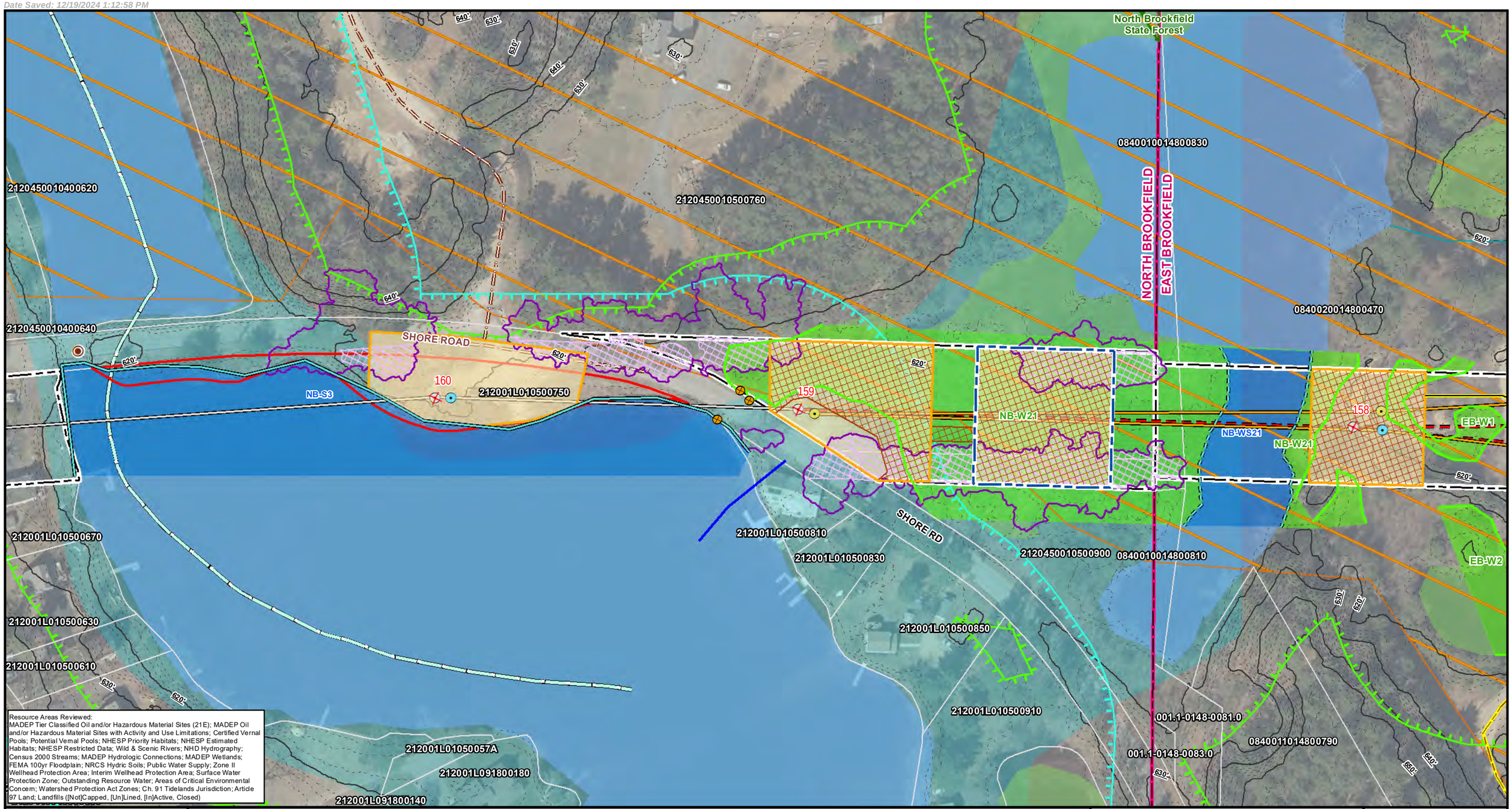

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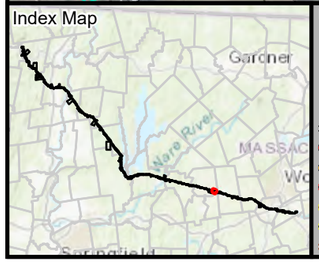

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Article 97 Lands

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

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North Brookfield & East Brookfield, MA

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HARRINGTON SWITCHYARD

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- 10ft Contour
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- Guardrail
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- Existing Treeline
- Tree Removal
- Selective Tree Removal
- Pruning
- Town Boundary
- Parcel Boundaries

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

East Brookfield, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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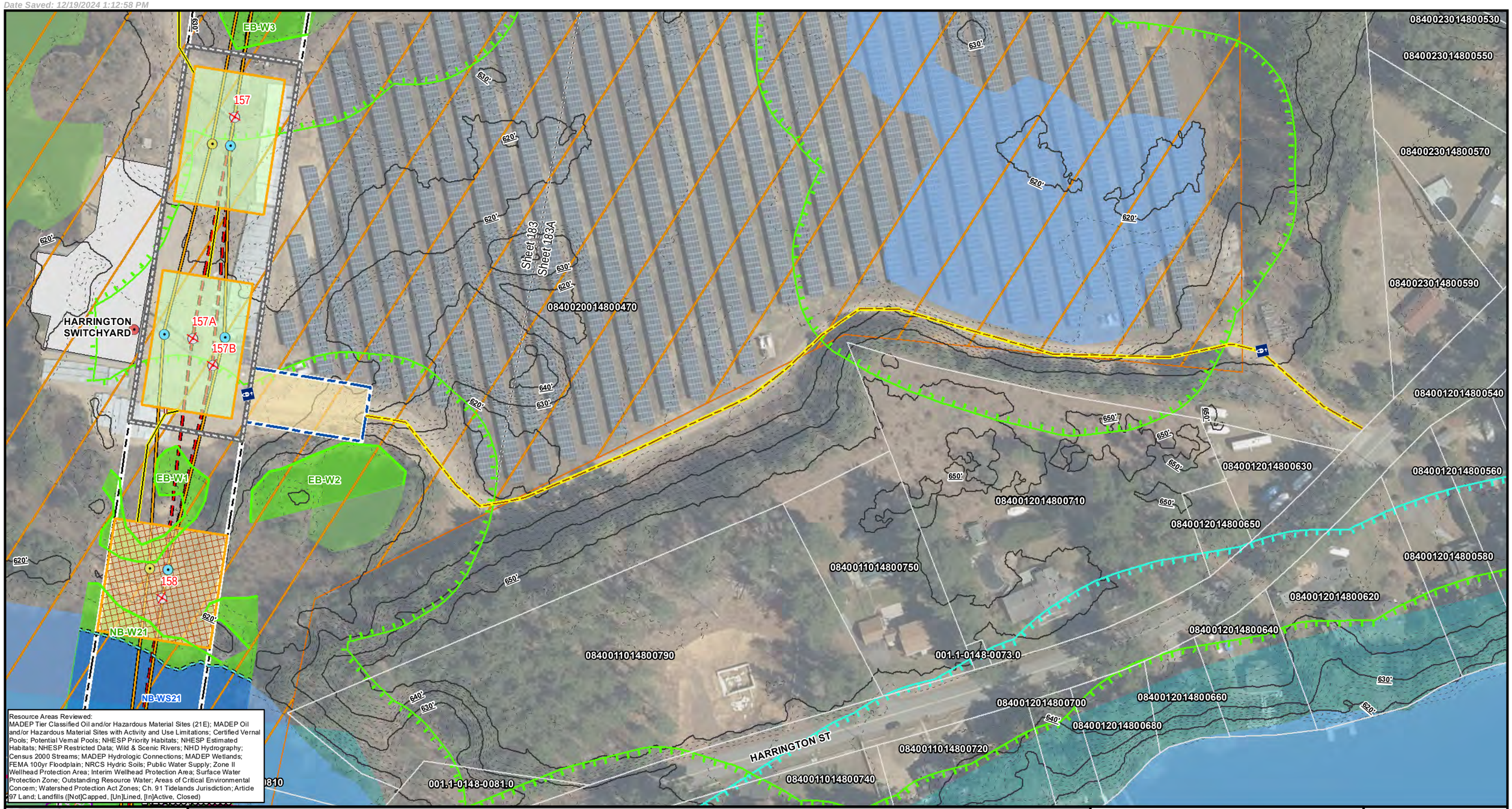

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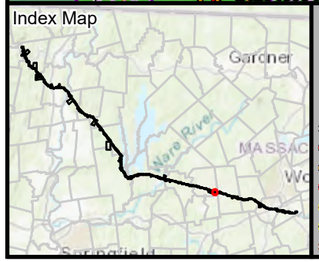

Legend

**Indicates Layers Set to Transparency*

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

East Brookfield, MA
Page 183A of 240

MassGIS
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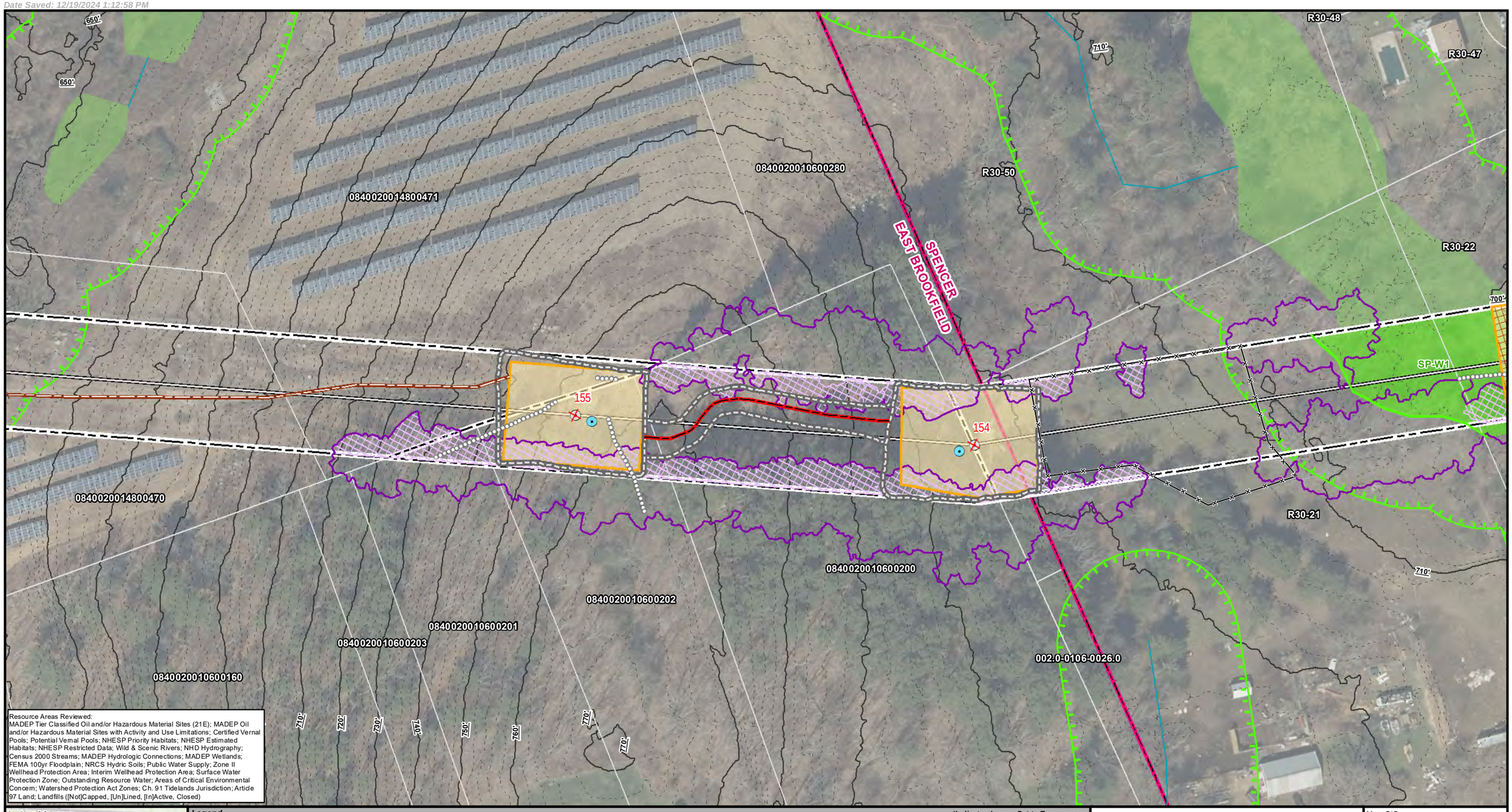

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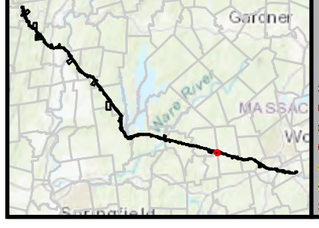

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

East Brookfield & Spencer, MA

MassGIS
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R30-47 R30-50 R30-39-1 R30-29 R30-28 R30-39 R30-14 R30-27 R30-26 R30-23 R30-25 R30-15 R30-21 R30-16 R30-24 R30-22 R30-16-2 R30-16-3 R30-17 SMITHVILLE RD

153 SP-W1 SP-WS1 152 151

700' 710' 690' 670' 660'

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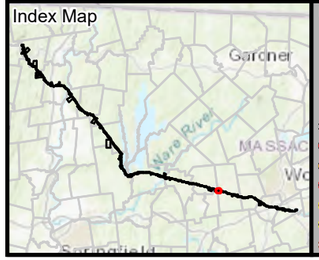

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Spencer, MA

MassGIS
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Sheet 186A
Sheet 186

R30-14
R30-7
R30-5
R30-5
R30-1
R30-15

SP-WS2
SP-W2

150
149
148

700'
690'
680'
670'
770'
760'
750'
740'
730'
720'
710'

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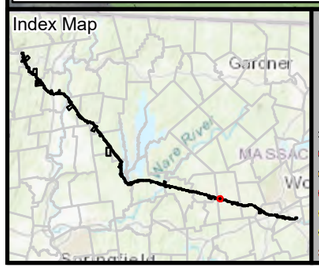

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Environmental Resources Map

Spencer, MA

MassGIS
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Sheet 187A
Sheet 187

SPAN STREAM

SP-W4
R30-2
SP-W3
SP-WS4
SP-W4
U11-9
U11-3
R30-1

148
147
146

760'
770'
710'
750'
740'
730'
720'
710'
700'
690'
680'
650'
640'
630'

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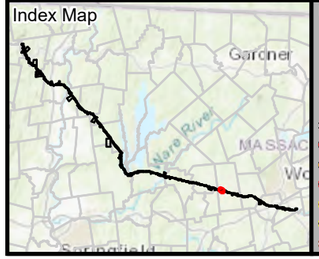

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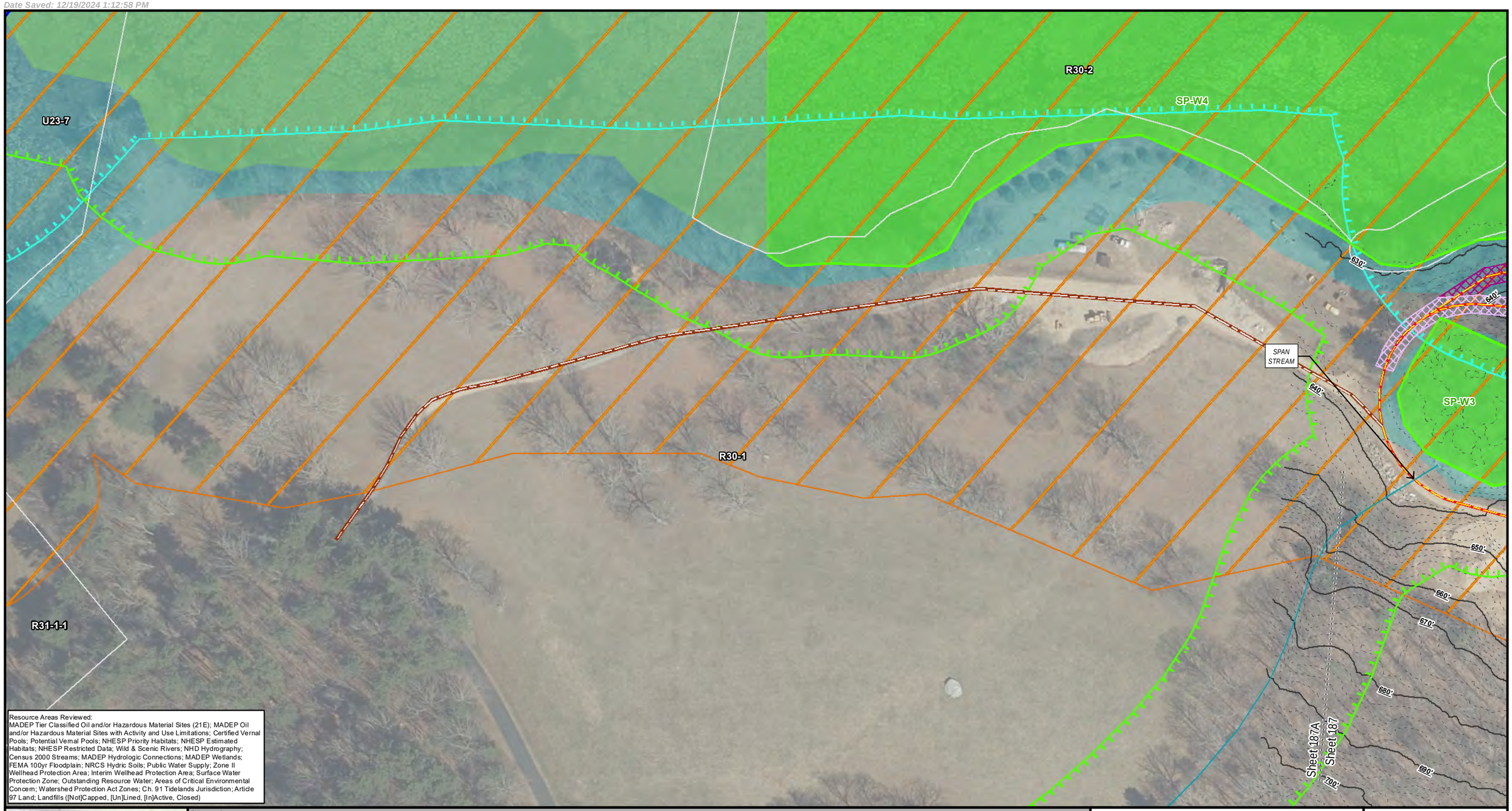

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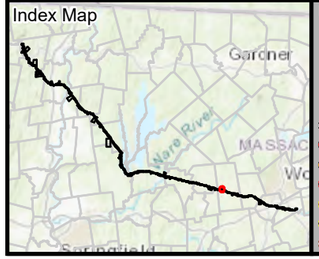

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Spencer, MA
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MassGIS
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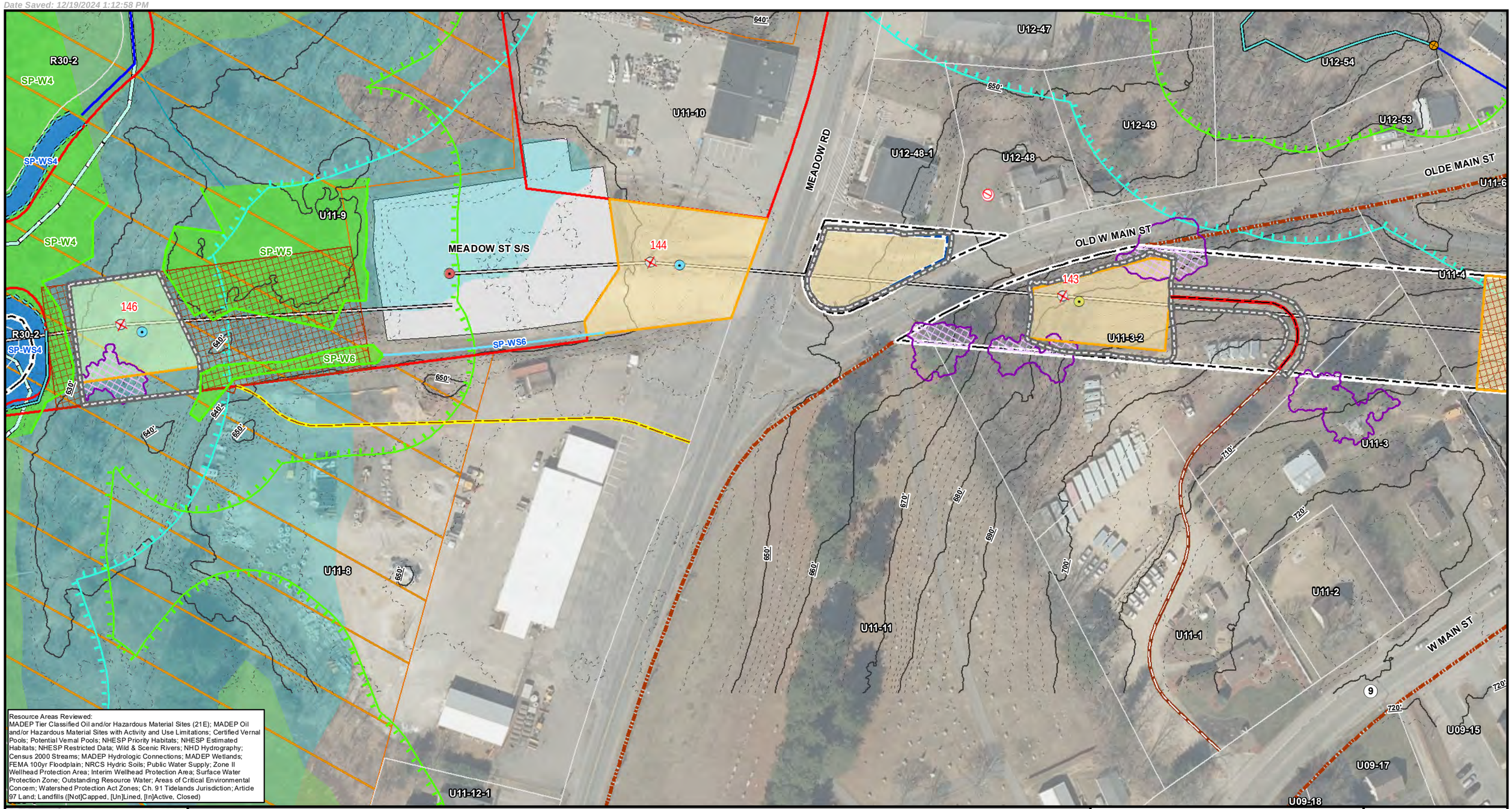

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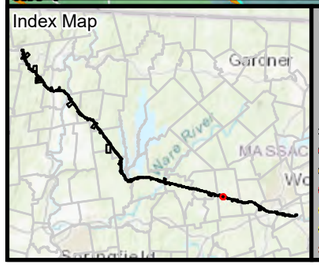

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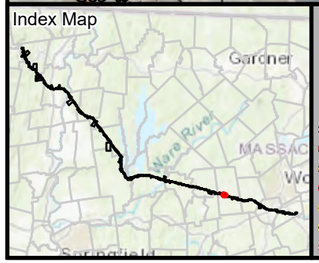

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U09-2
U09-2
VALLEY ST
U08-103
SP-W9
U02-73
U02-66
U08-104
O'gara Park
U08-94
INCOME EJ
POPULATION
U02-58
U09-3
U01-2
SP-W7
U09-6-2
U09-6-2
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138
137
136
SP-W8
SP-W8
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Bixby Road Cr

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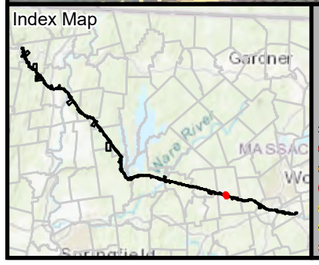

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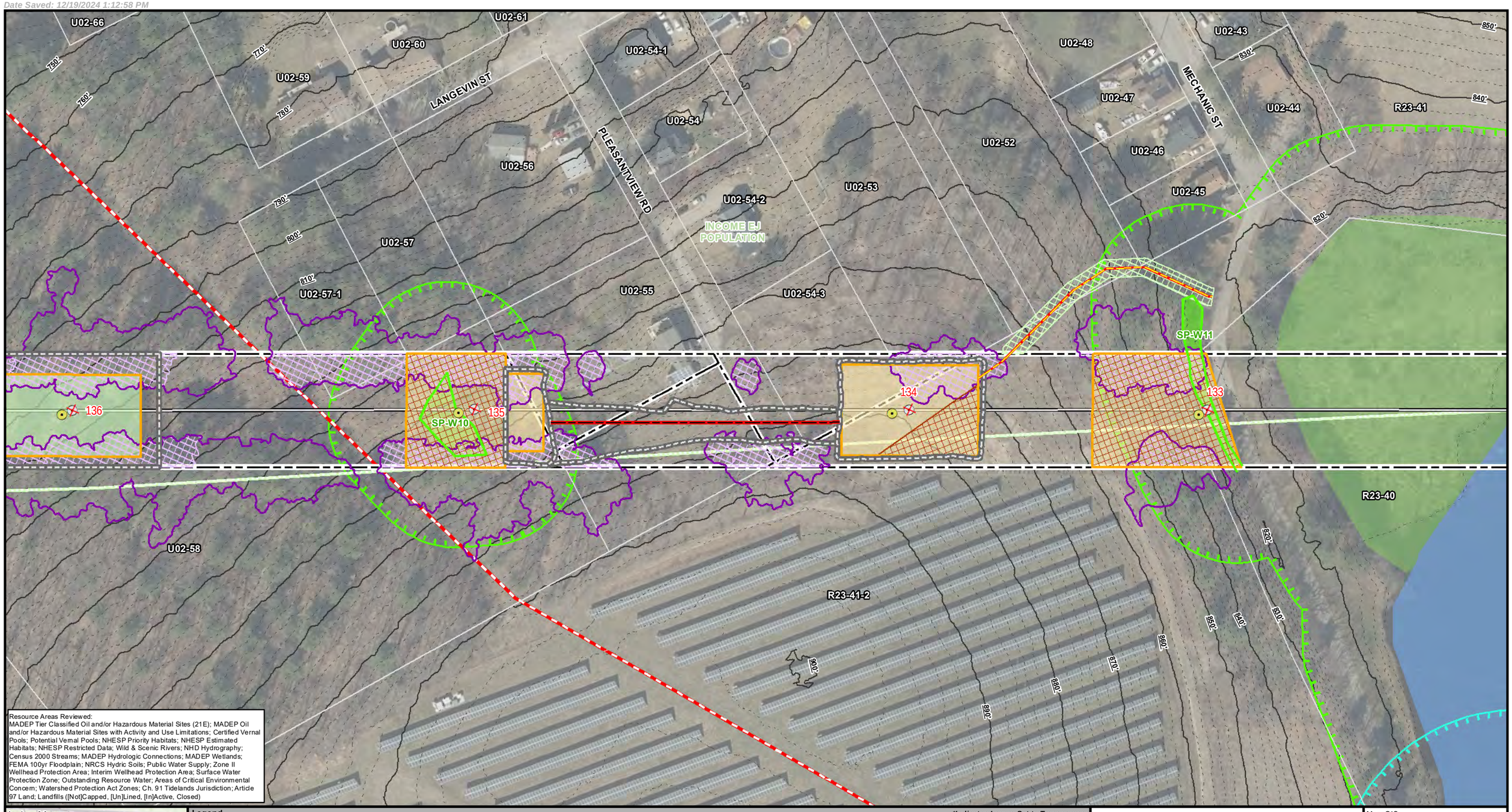

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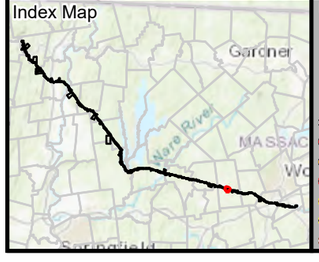

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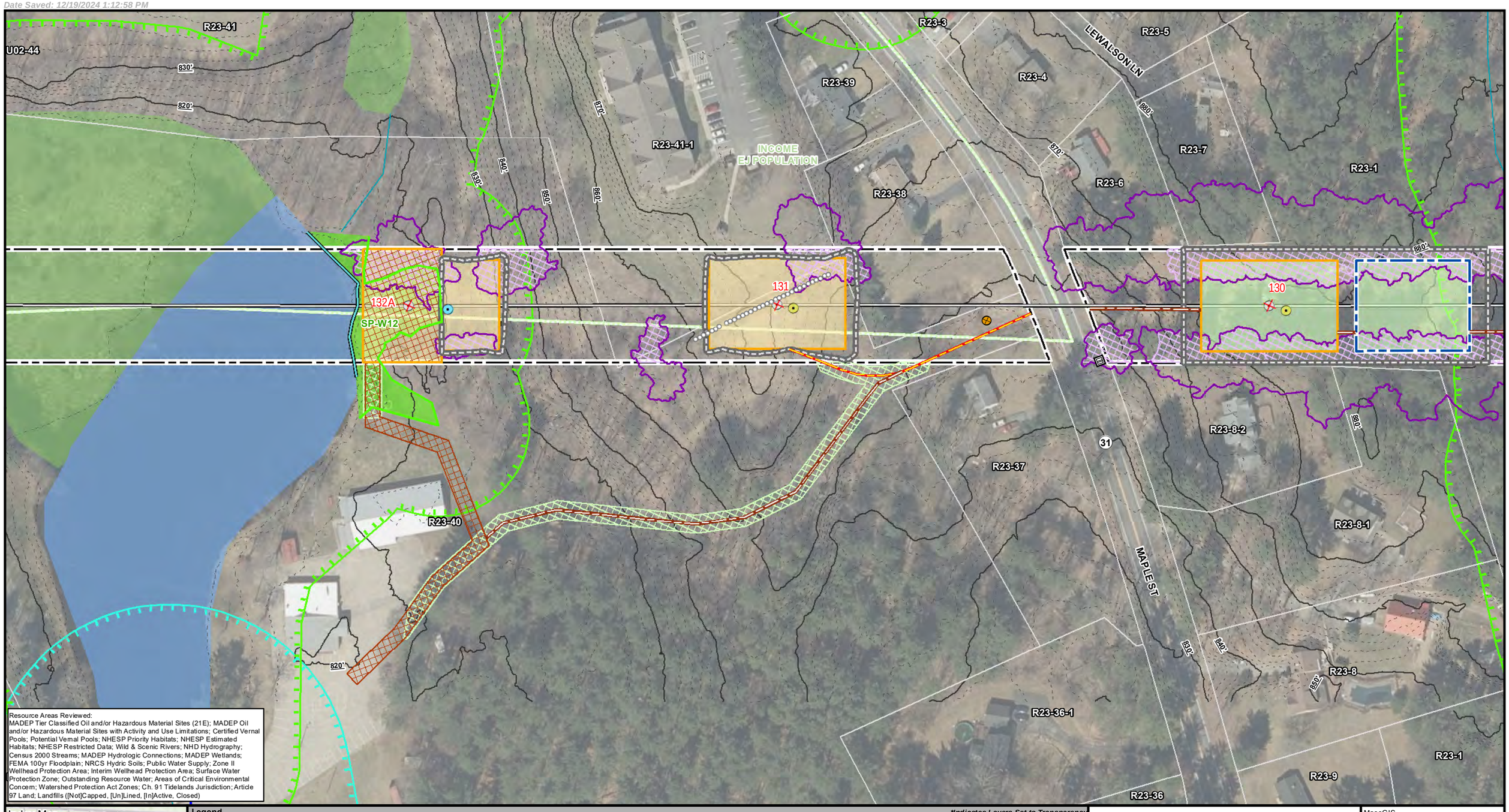

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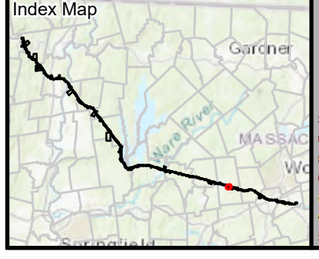

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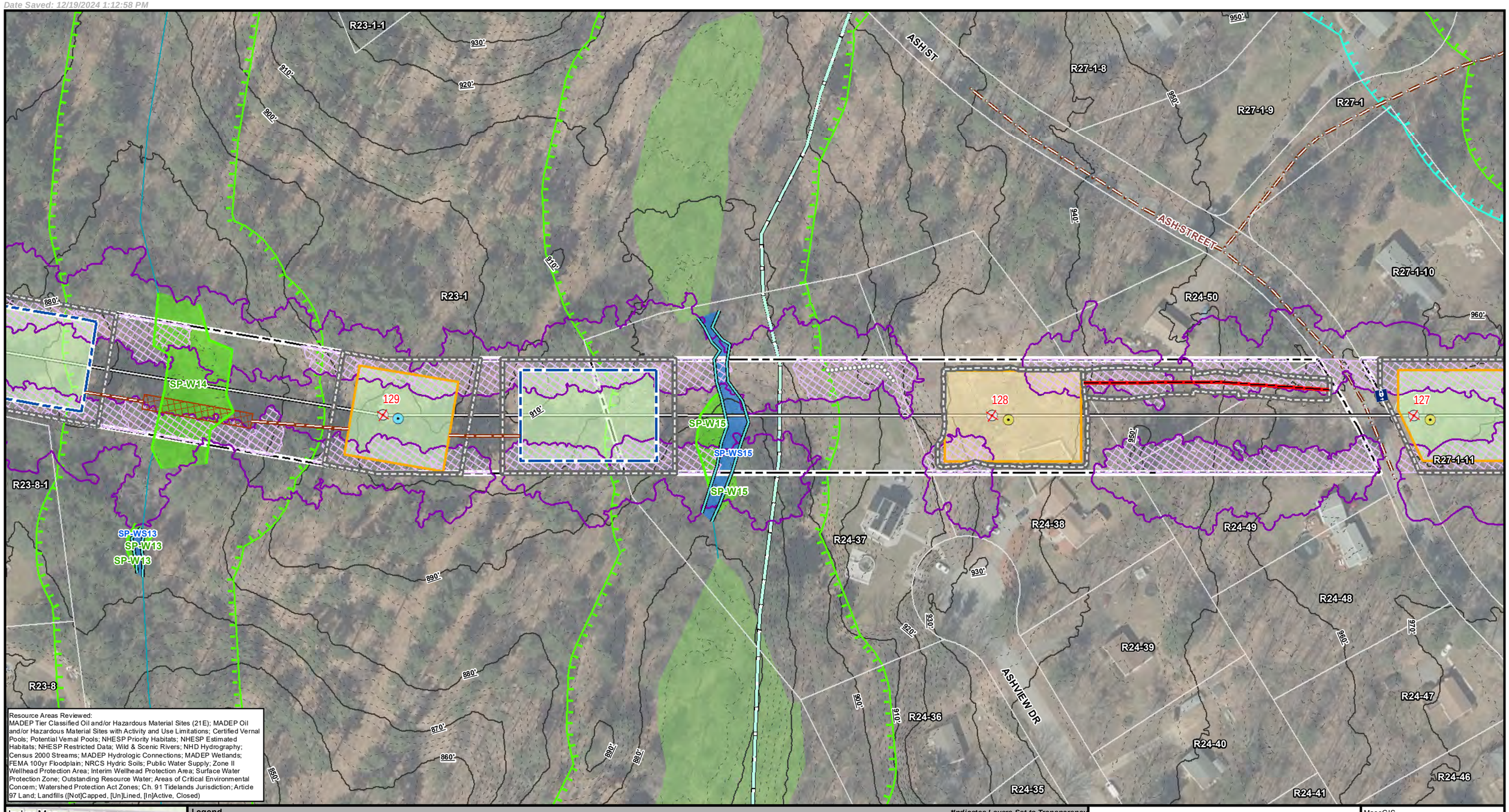

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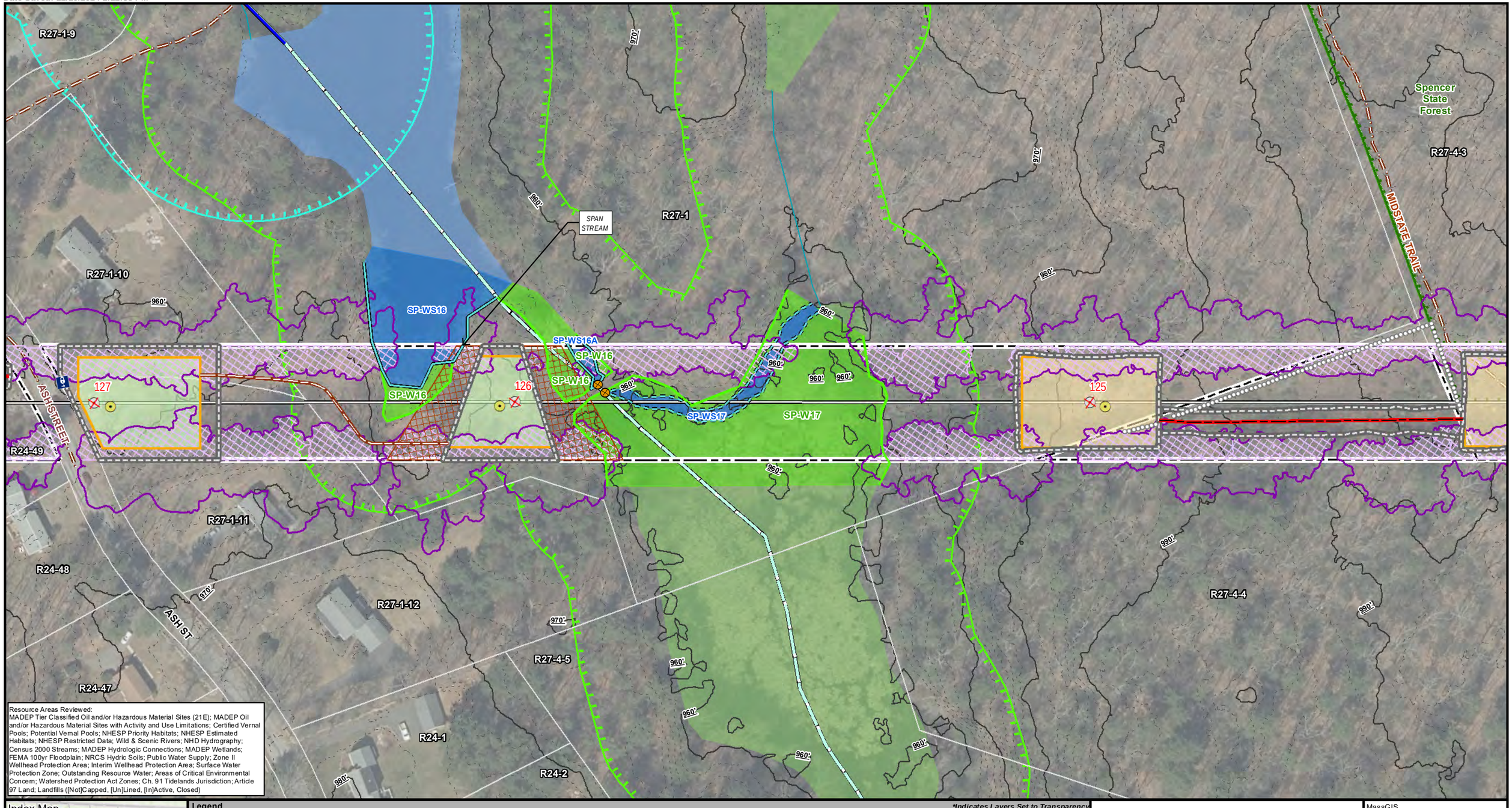

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- Parcel Boundaries

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- DCR-State Parks & Recreation

N

1 inch = 100 feet

0 50 100

Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Spencer, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Sheet 195A
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990'

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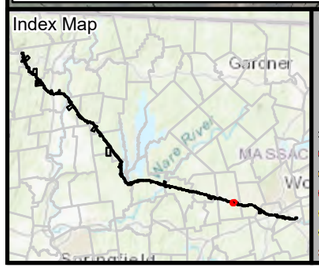

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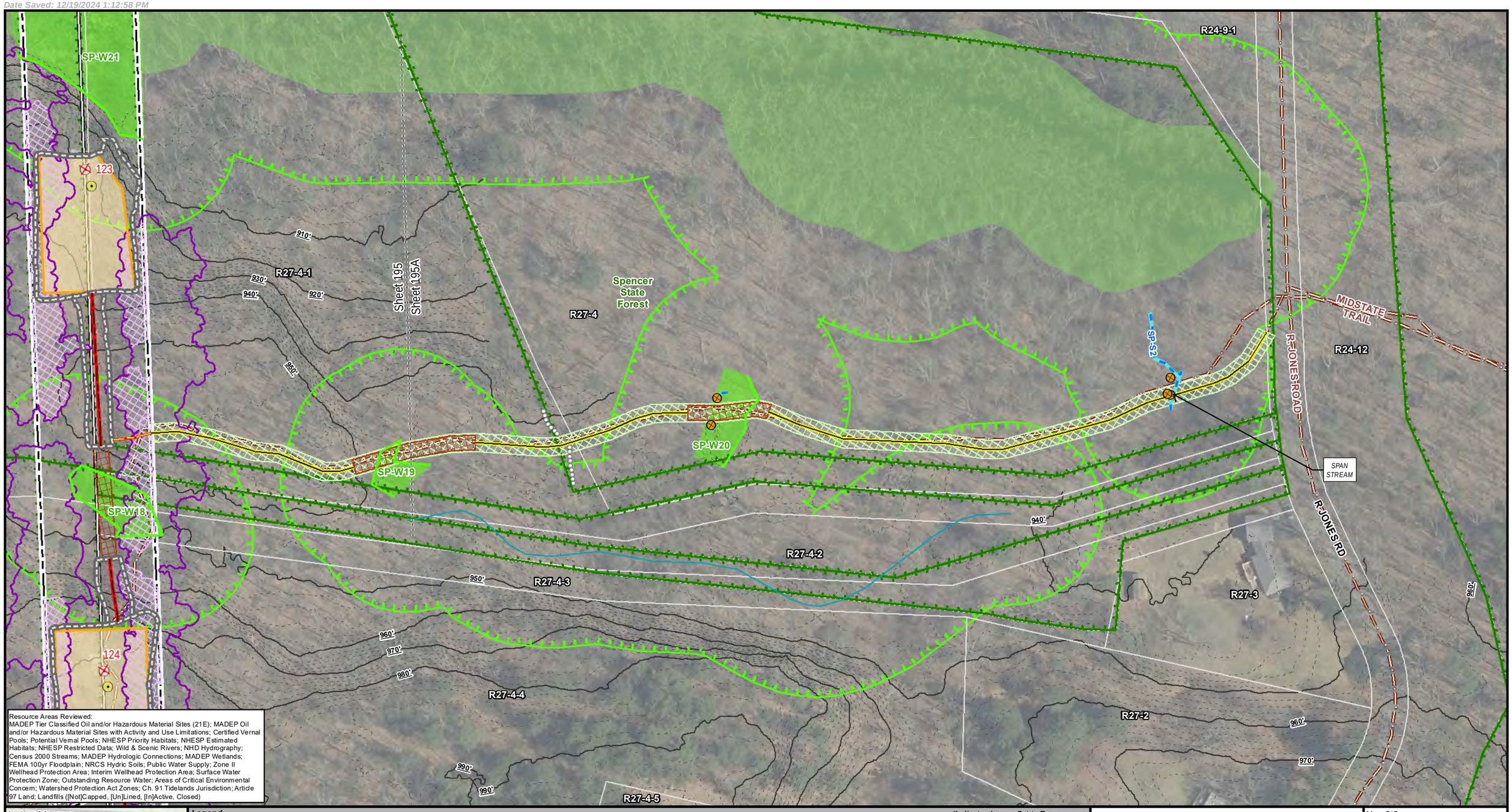

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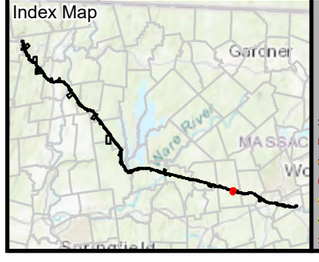

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Spencer, MA
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MassGIS
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R JONES RD
SP-WS22
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121
120
119
940'
950'
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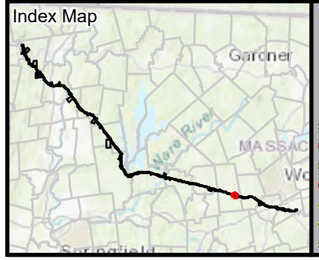

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

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Gardner
Springfield

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Spencer, MA

MassGIS
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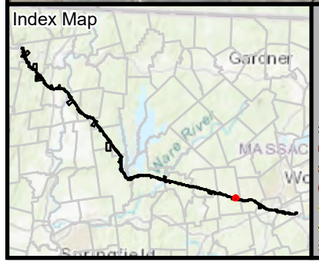

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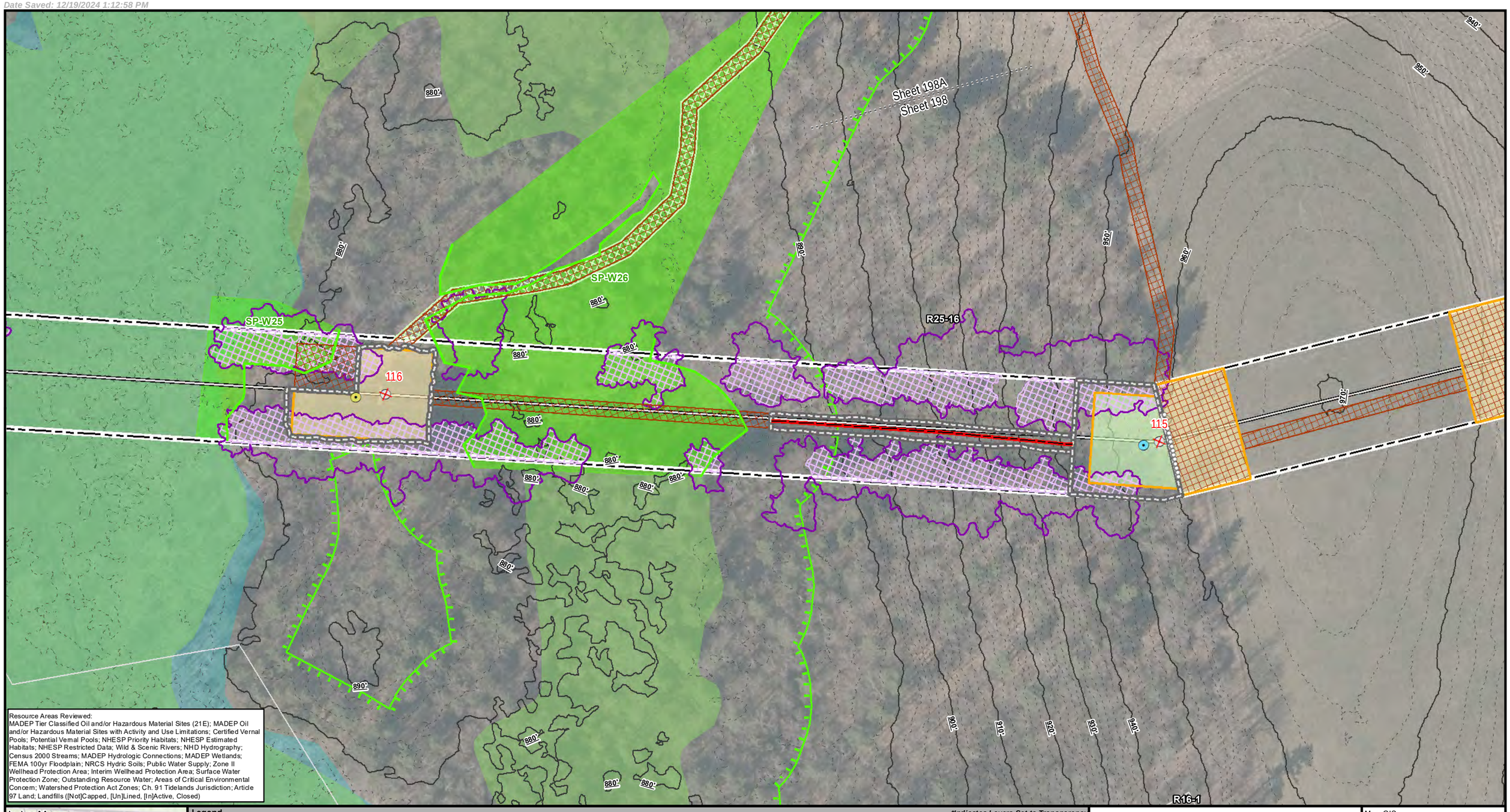

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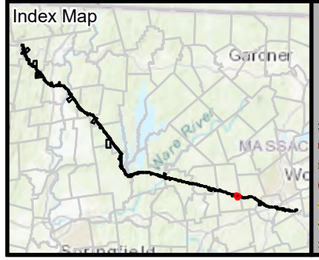

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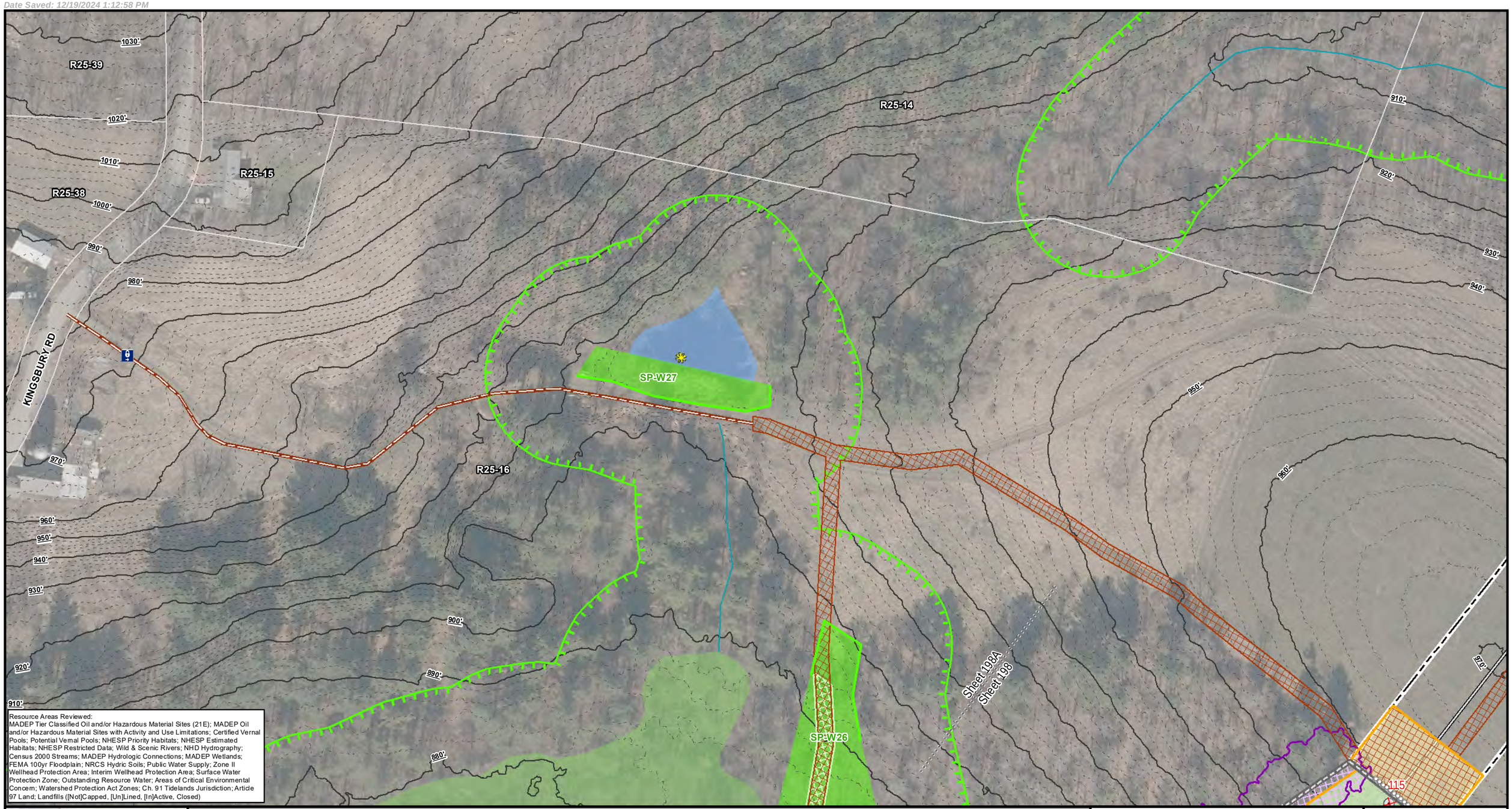

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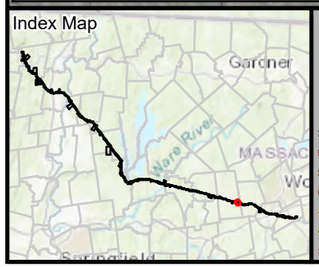

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Spencer, MA

MassGIS
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R25-14 R16-23 R16-34 R16-35 R16-30 R16-22-1 FAIRVIEW DR R16-40 R16-22-2 R16-41 R16-42 GREENVILLE ST R25-16 R16-21 R16-22

114 113 112 SP-W28 SP-W29

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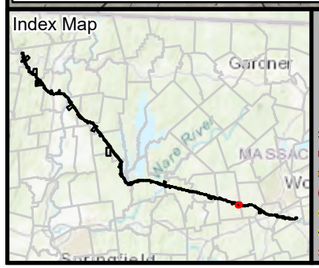

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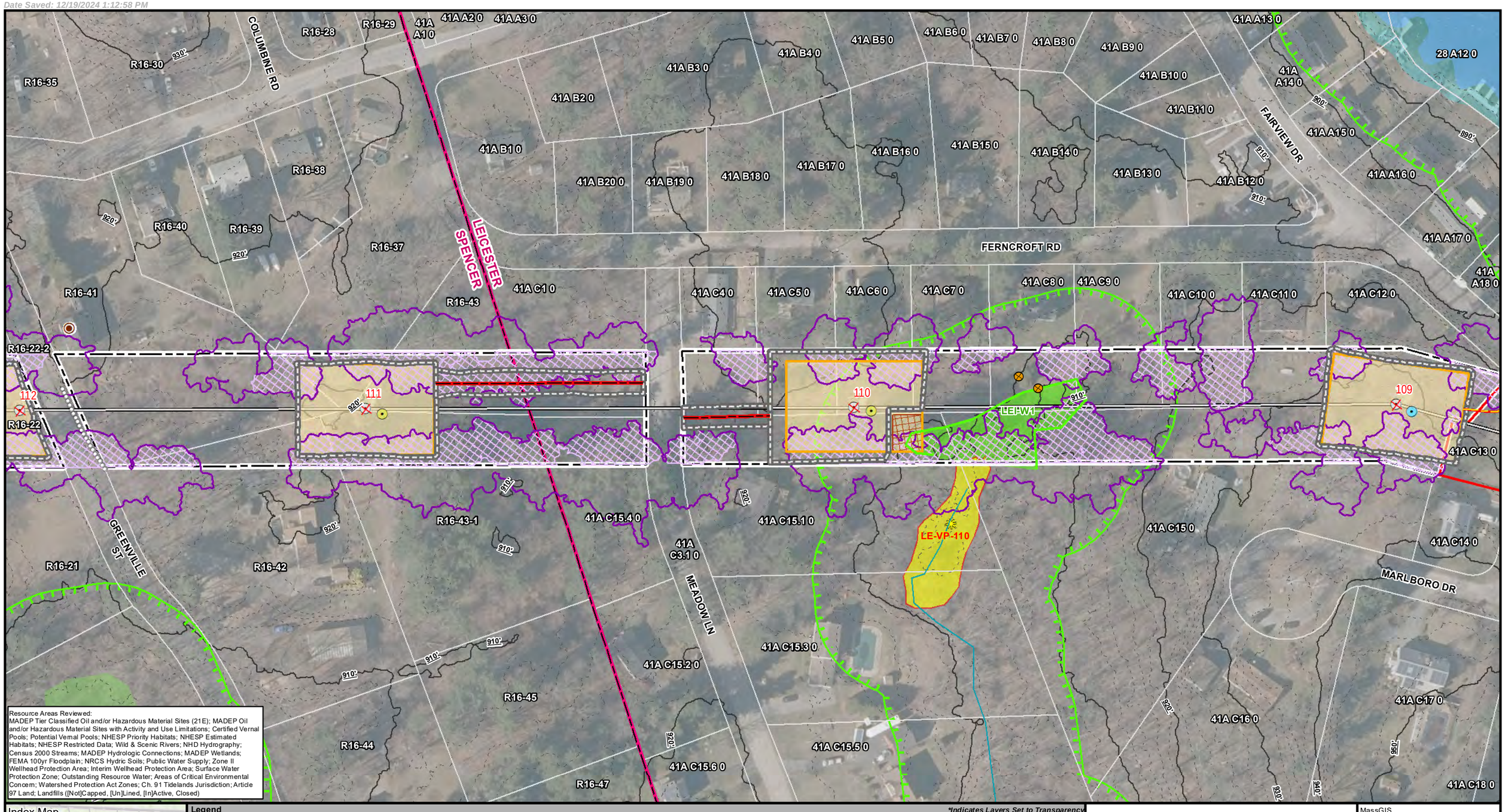

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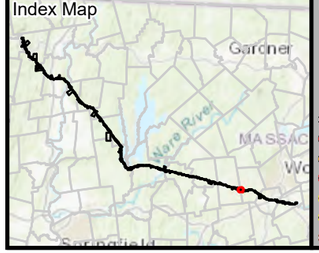

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Environmental Resources Map

Spencer & Leicester, MA

MassGIS
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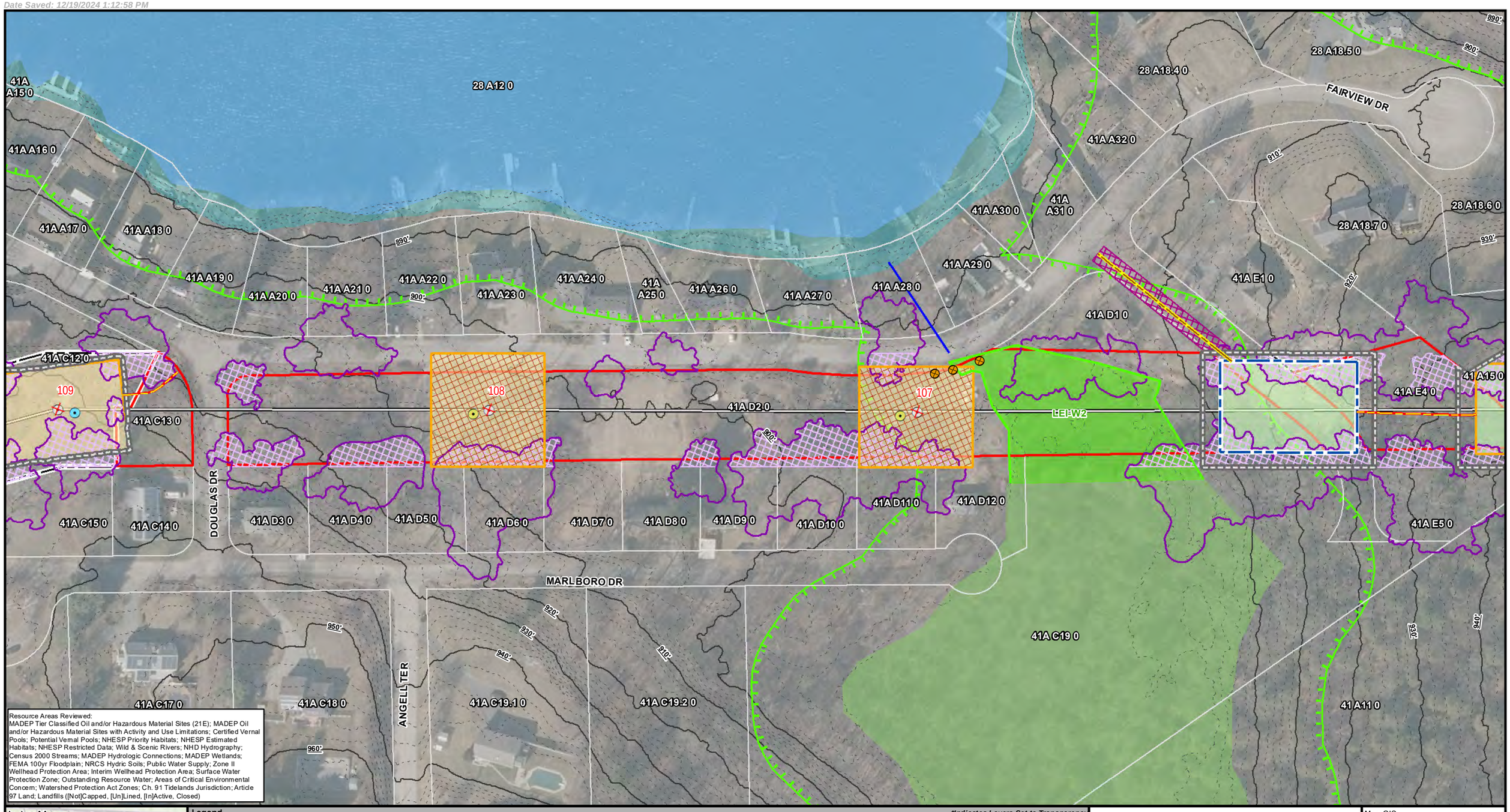

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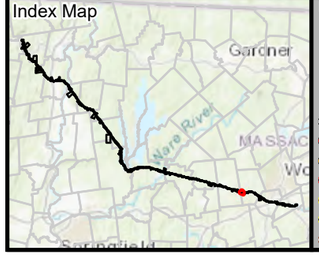

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Leicester, MA

MassGIS
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28 A18.4 0
28 A18.5 0
FAIRVIEW DR
900'
890'
28 A12 0
28 A18.1 0
40 A11 0
870'
880'
880'
910'
28 A18.7 0
41A
E1 0
28 A18.6 0
880'
28 A18 0
890'
40 A10 0
920'
930'
41A E4 0
106
105
41A 15 0
LEI-W3
LEI-W4
104
LEI-W3
870'
41A E5 0
LEI-WS3
41A C19 0
41A11 0
Burncoat
Brook
40 A10.1 0
870'
960'
940'
940'
CHARLES ST
41 A14.1 0
PINE ST
870'
41 A14 0
40 B1 0
860'

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Index Map
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Ware River
MASSAC
Springfield

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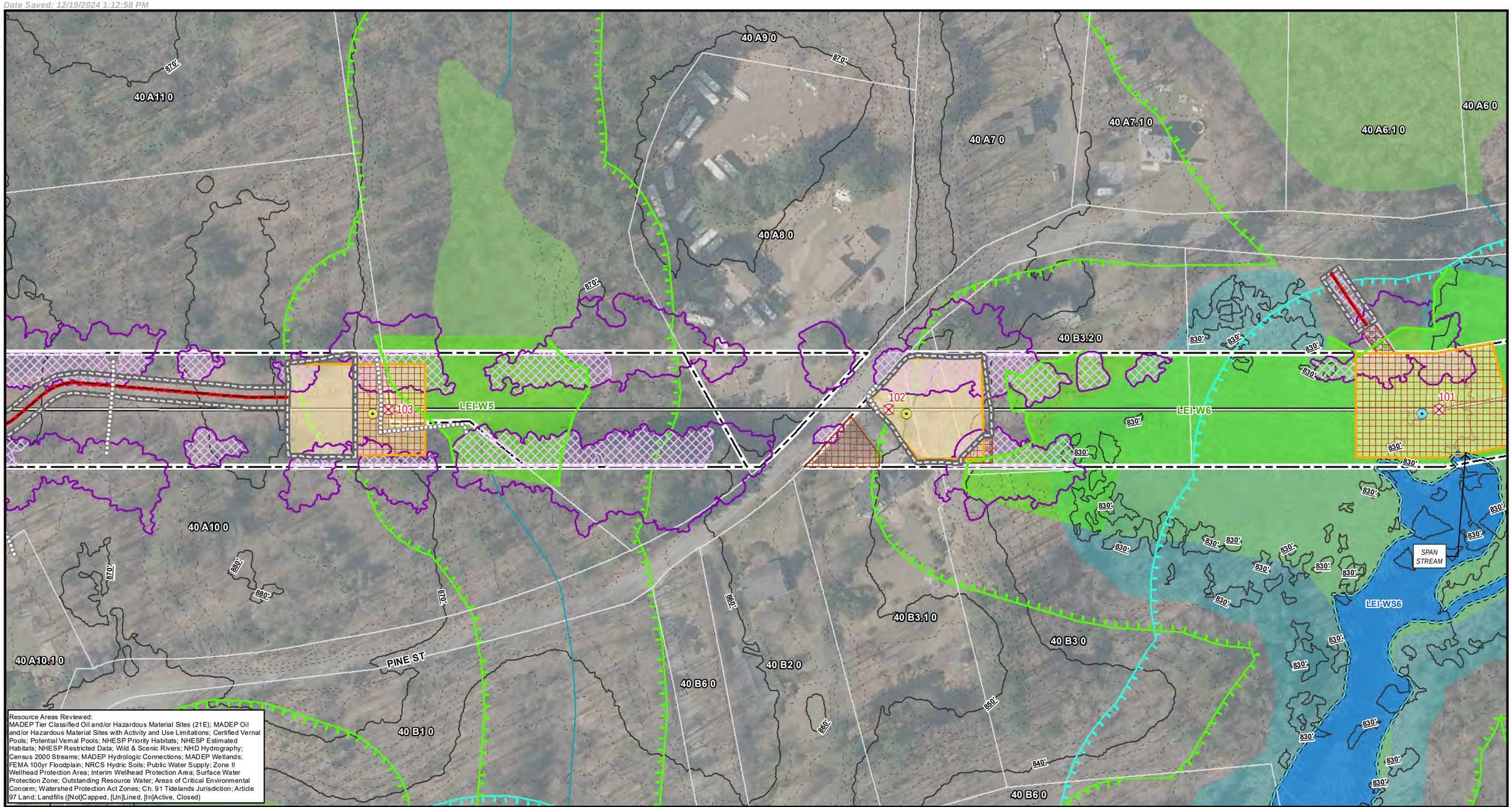

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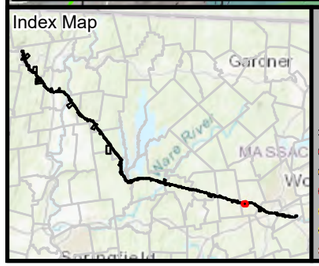

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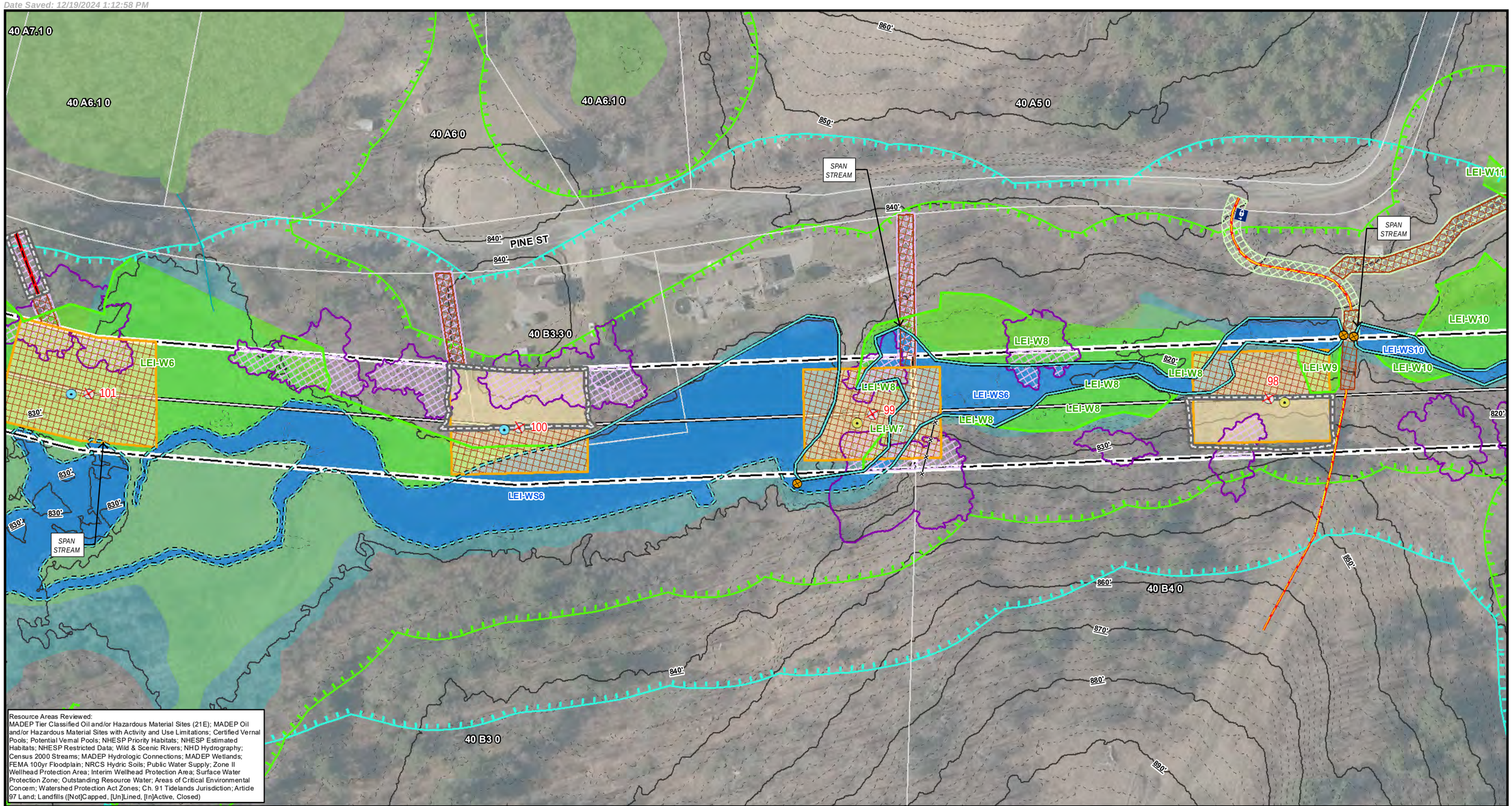

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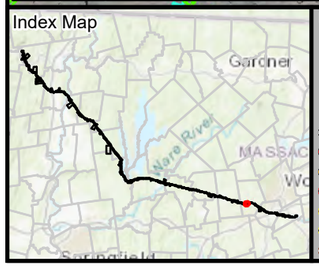

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Leicester, MA

MassGIS
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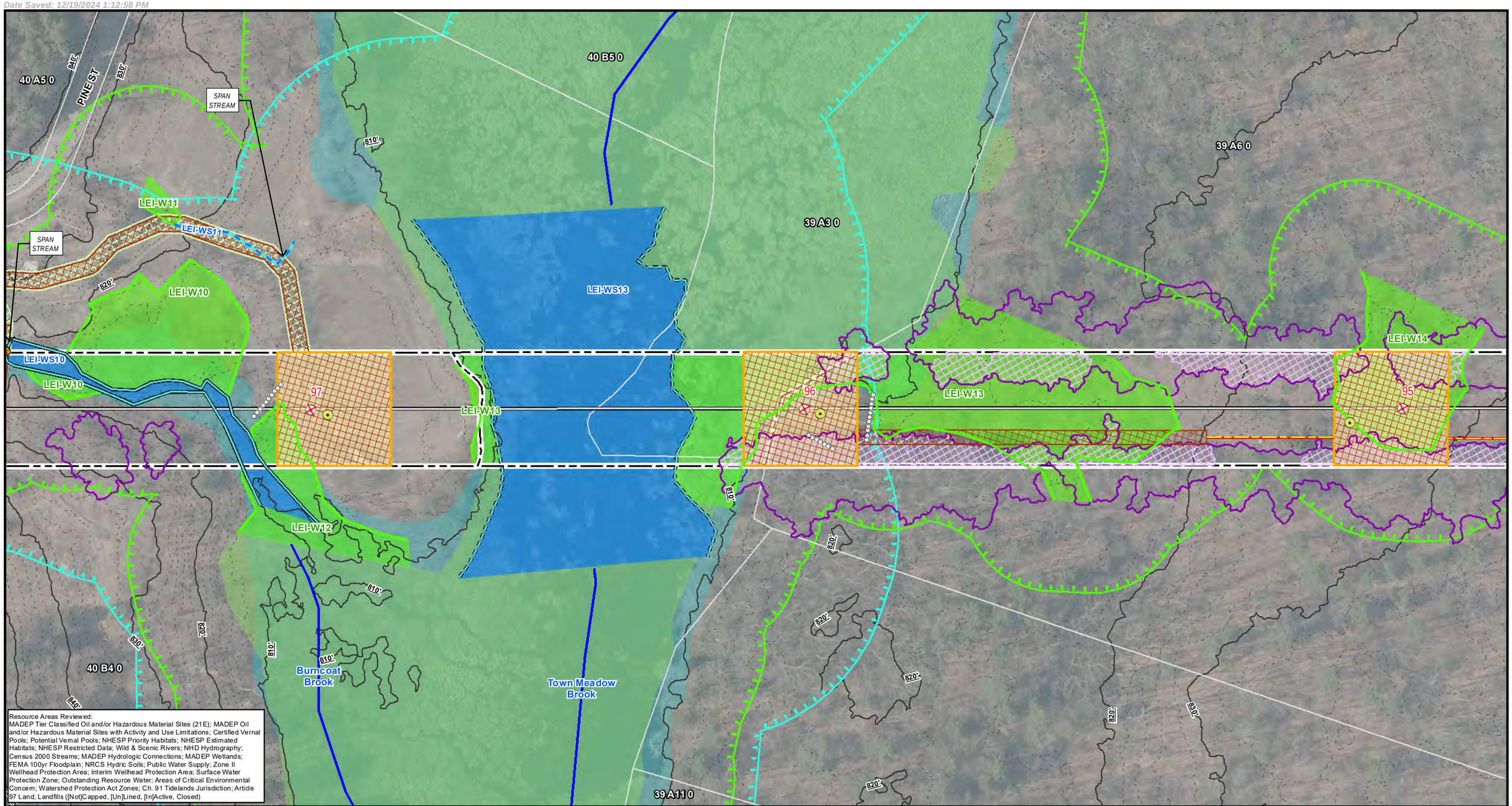

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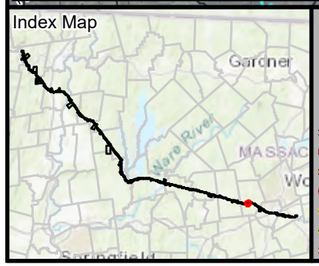

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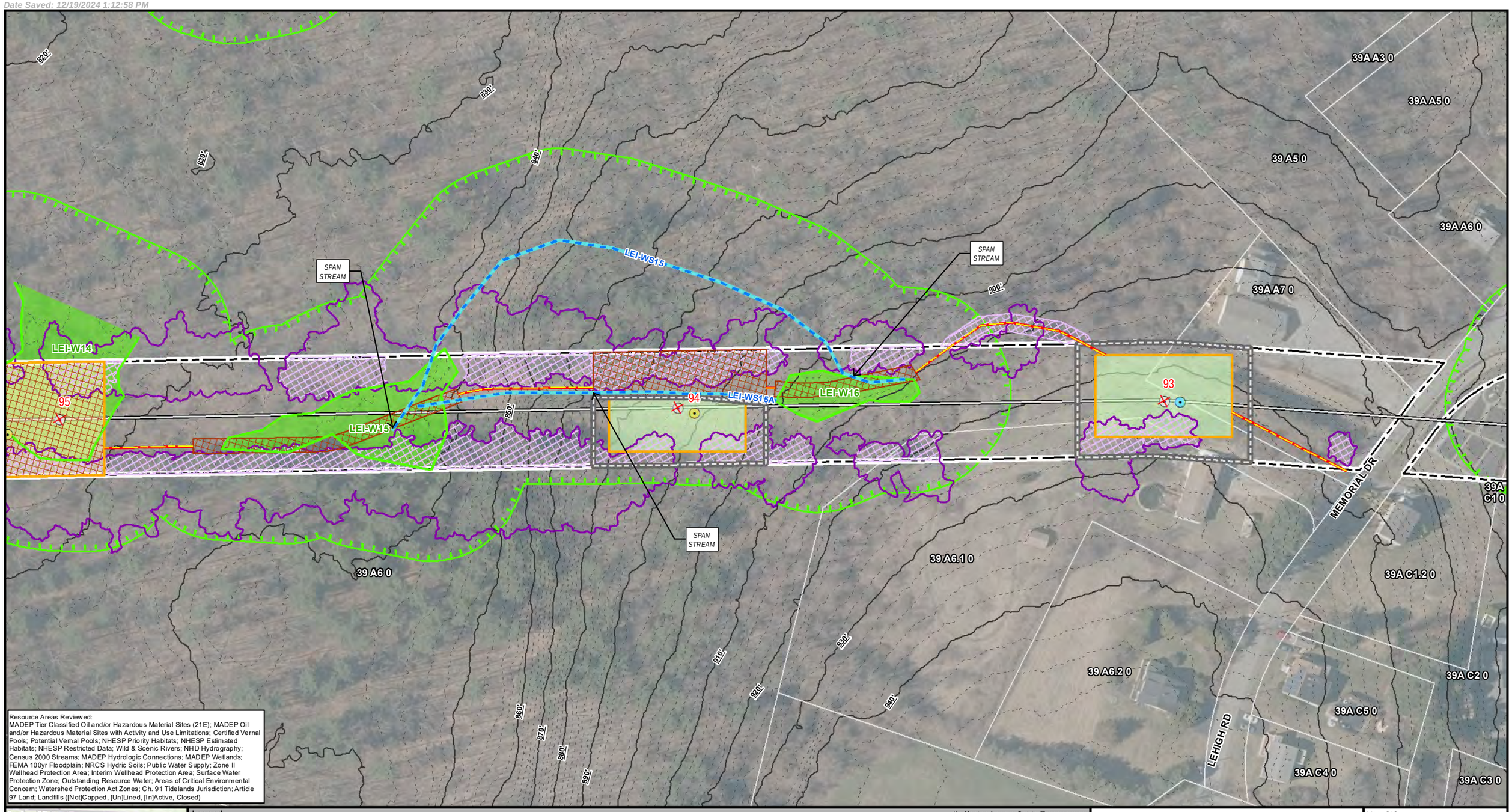

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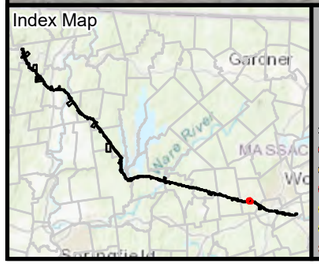

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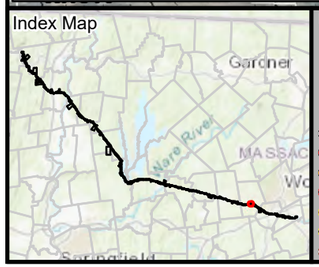

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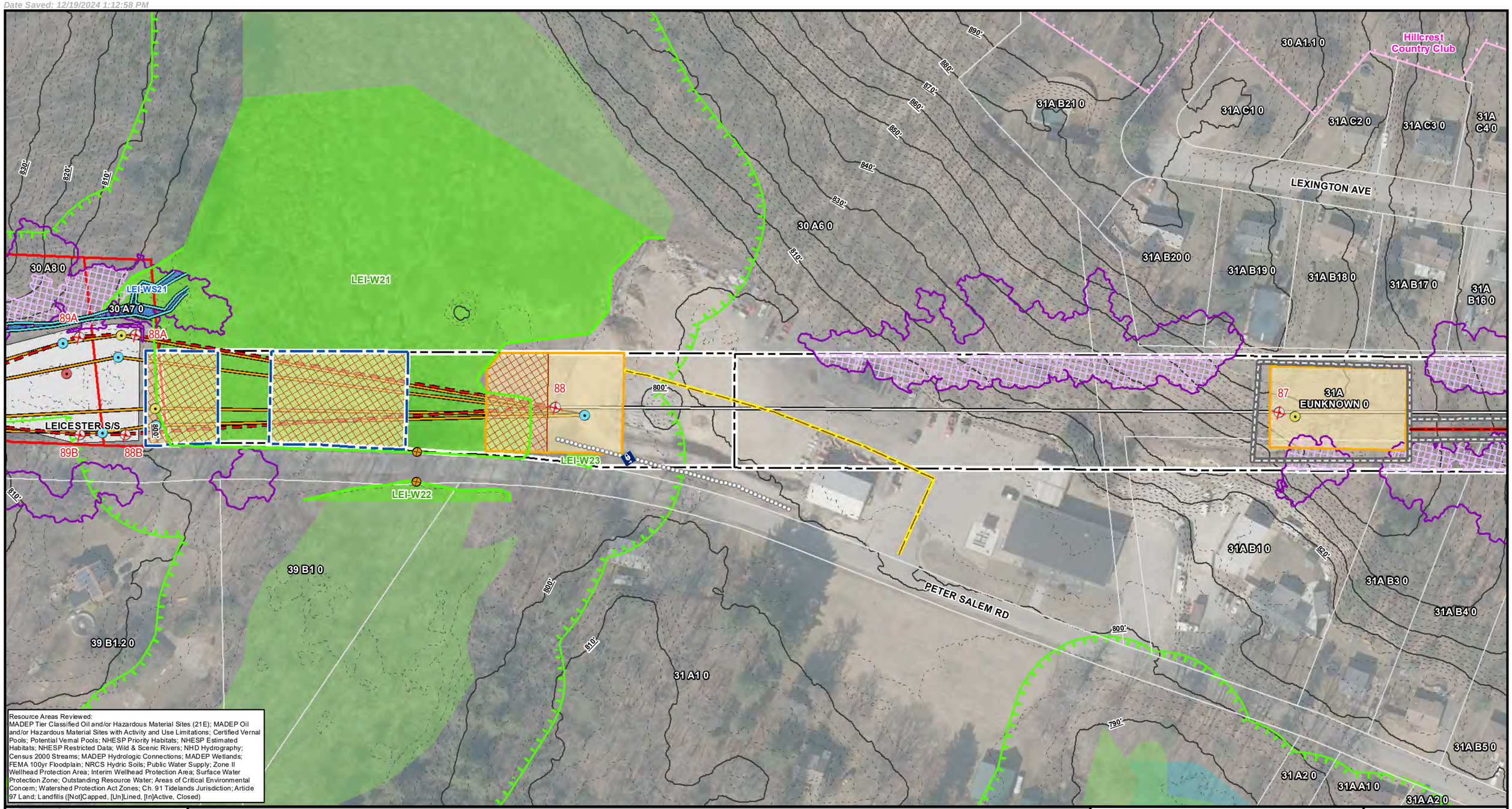

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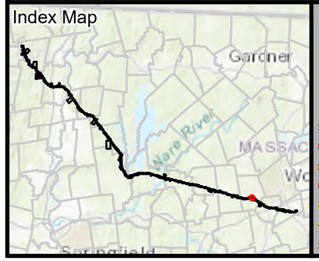

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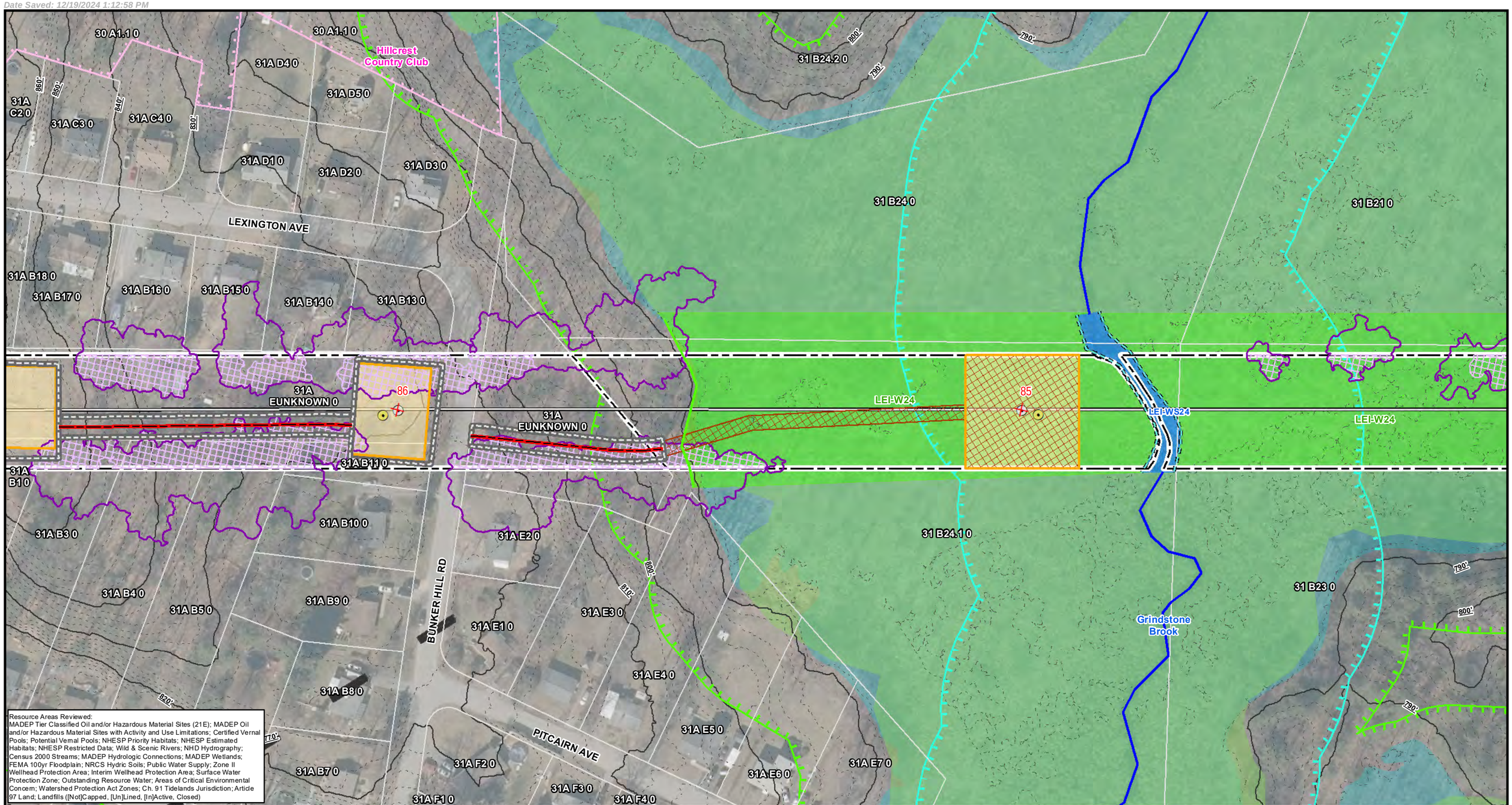

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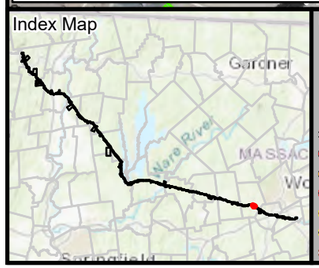

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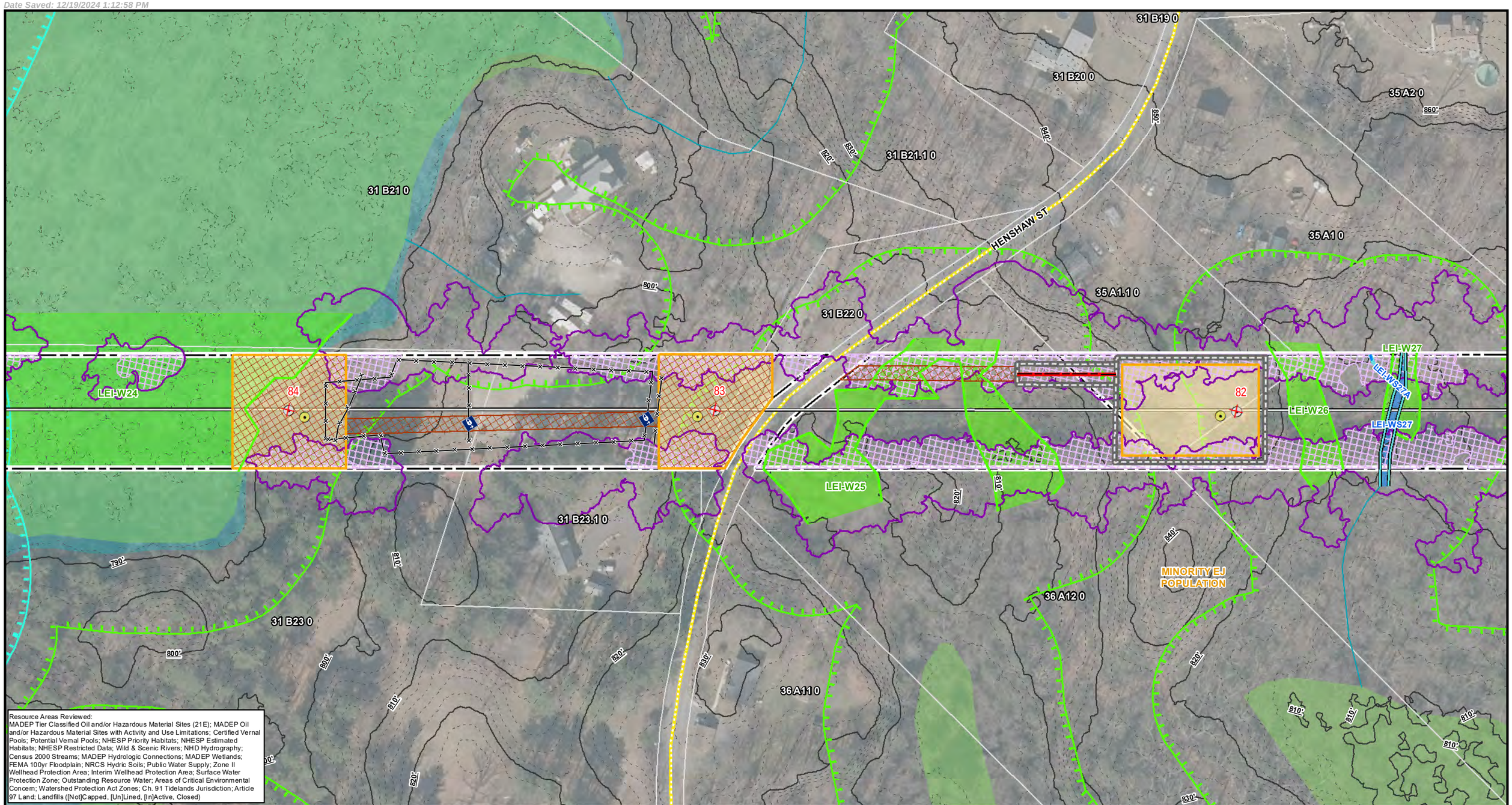

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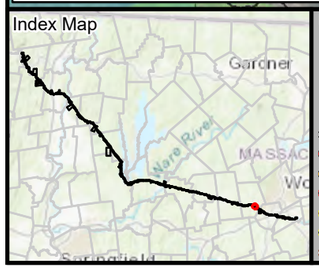

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ENTIRE MAP PAGE IS WITHIN MINORITY ENVIRONMENTAL JUSTICE POPULATION

BOUTILIER RD

35 B1 0
35 B1.1 0
35 B2.1 0
35 B3 0
35 A2 0
35 A2.2 0
35 A2.1 0
35 A1 0
36 A1.4 0
36 A1.3 0

MINORITY EJ POPULATION

81
80
79

LEI-W27
LEI-WS27A
LEI-WS27
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LEI-W28
LEI-W29

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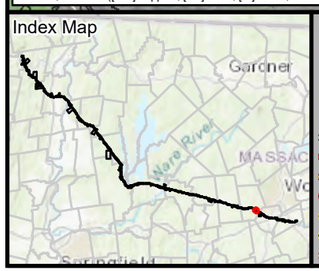

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Environmental Justice Populations 2020

- Minority

1 inch = 100 feet
0 50 100
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Leicester, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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35 B3 0

35 B3.1 0

36 A1.3 0

36 A3 0

36 A1.2 0

MINORITY EJ POPULATION

BOUTILIER RD

79

78

77

LEI-W29

LEI-W30

LEI-W31

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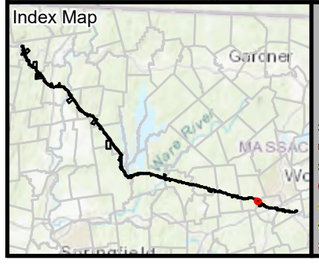

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35 F4 0
35 E2.3 0
35 F2 0
OLD STAFFORD TPKE
35 B3 0
35 B4 0
35 E2.1 0
36 B2 0
MINORITY EJ POPULATION
35 B3.1 0
STAFFORD ST
35 F1 0
35 E2.2 0
35 E2 0
LEI-W30
76
75
LEI-W32
LEI-WS32
74
21_13
36 A2 0
36 A1 0
36 A1.3 0
36 B1 0
36 A1.1 0

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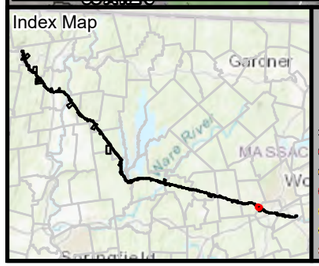

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Leicester, MA

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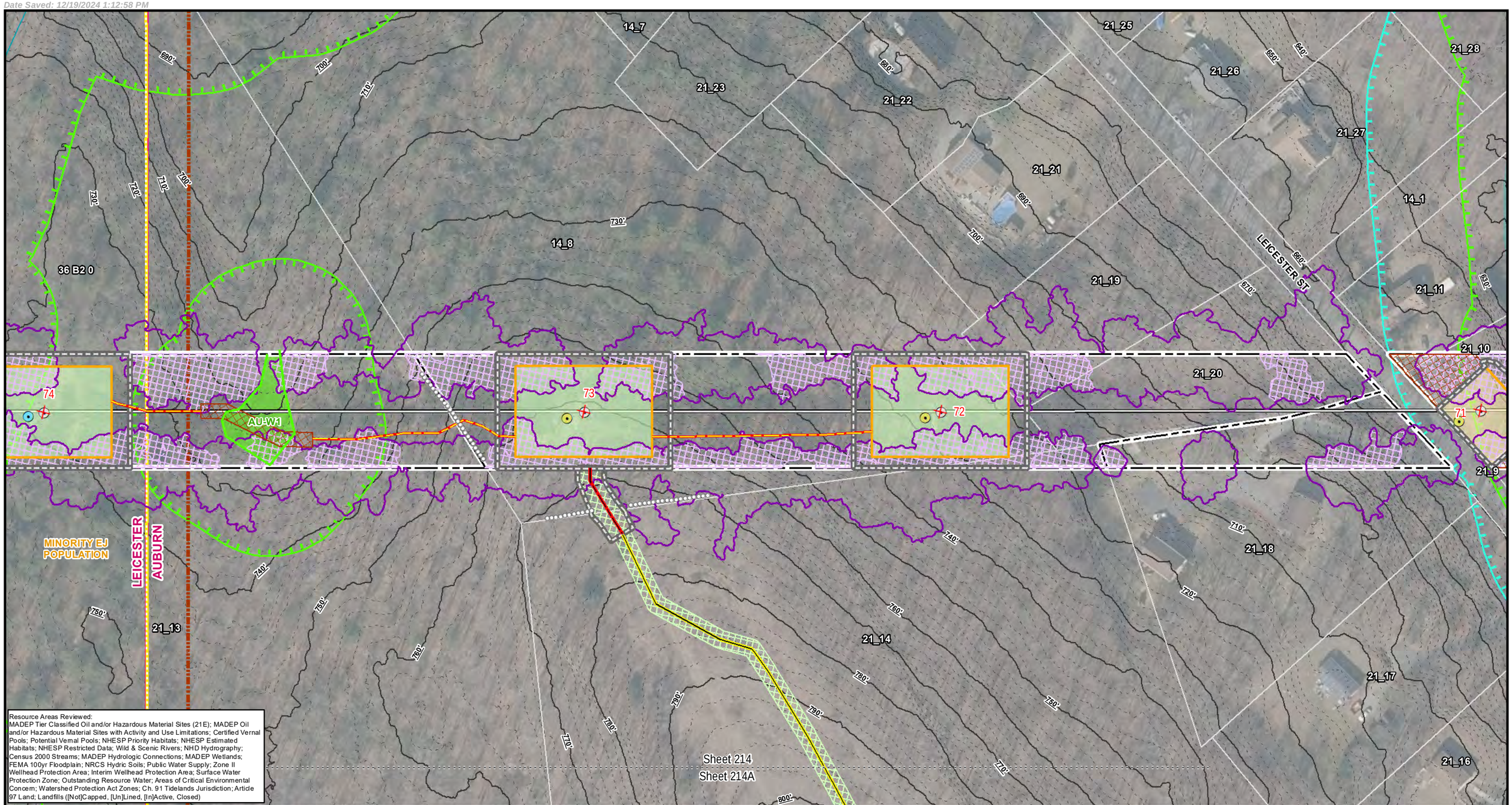

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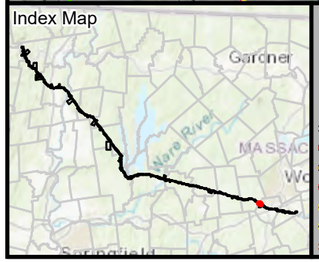

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Leicester & Auburn, MA

MassGIS
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LEICESTER ST
HENSHAW ST
ROCHDALE ST
GROWL HILL RD
Henshaw Street Land
Kinnear Brook
AU-W1
AU-W2
AU-W3
AU-WS2
AU-VP-73
71
72
73
Sheet 214
Sheet 214A
MINORITY EJ POPULATION
AUBURN
LEICESTER

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Article 97 Lands

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1 inch = 225 feet
0 110 220
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Auburn & Leicester, MA

MassGIS
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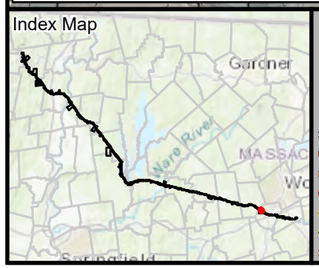

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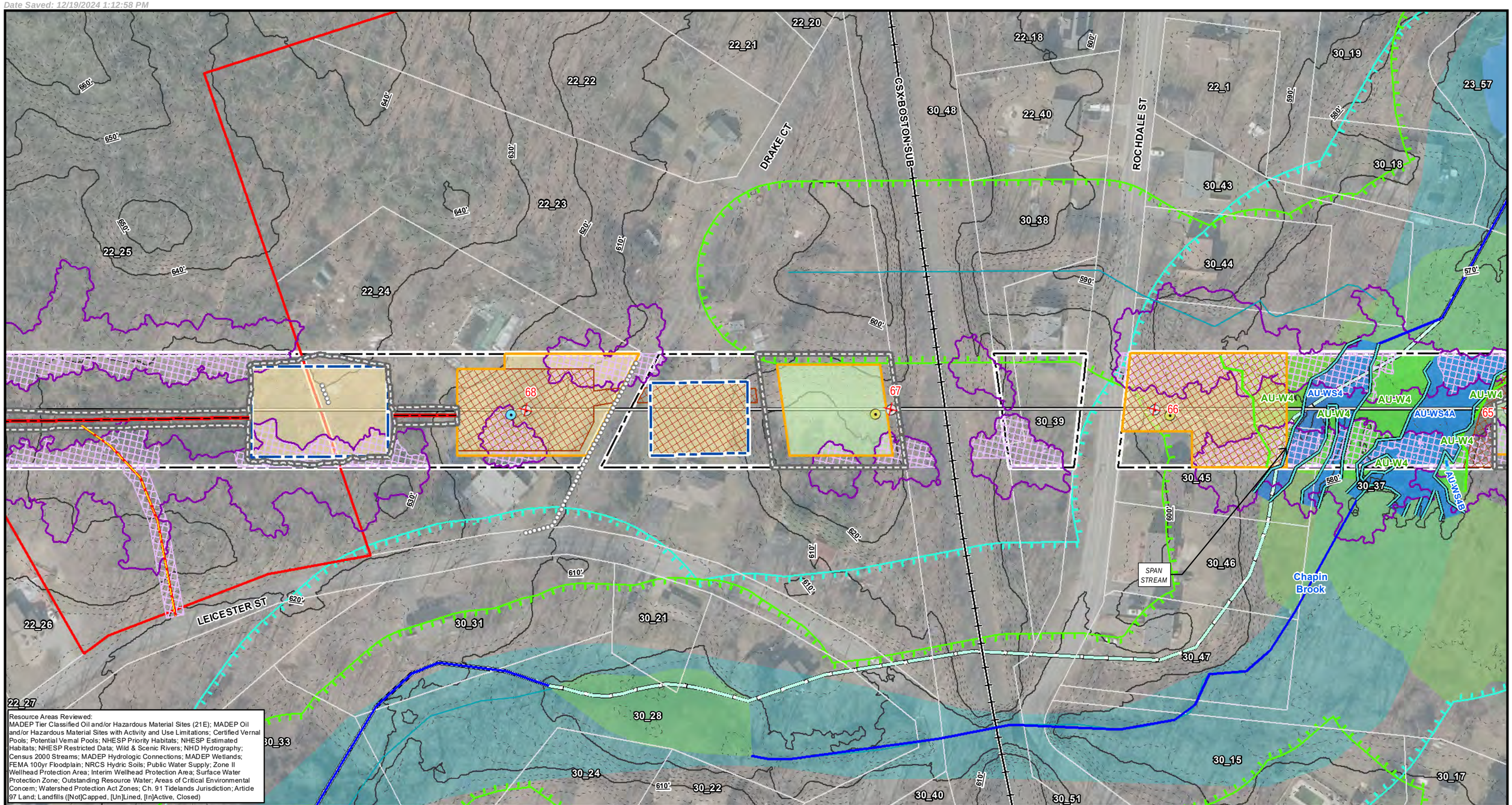

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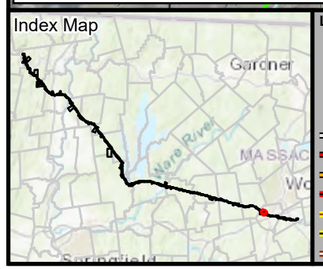

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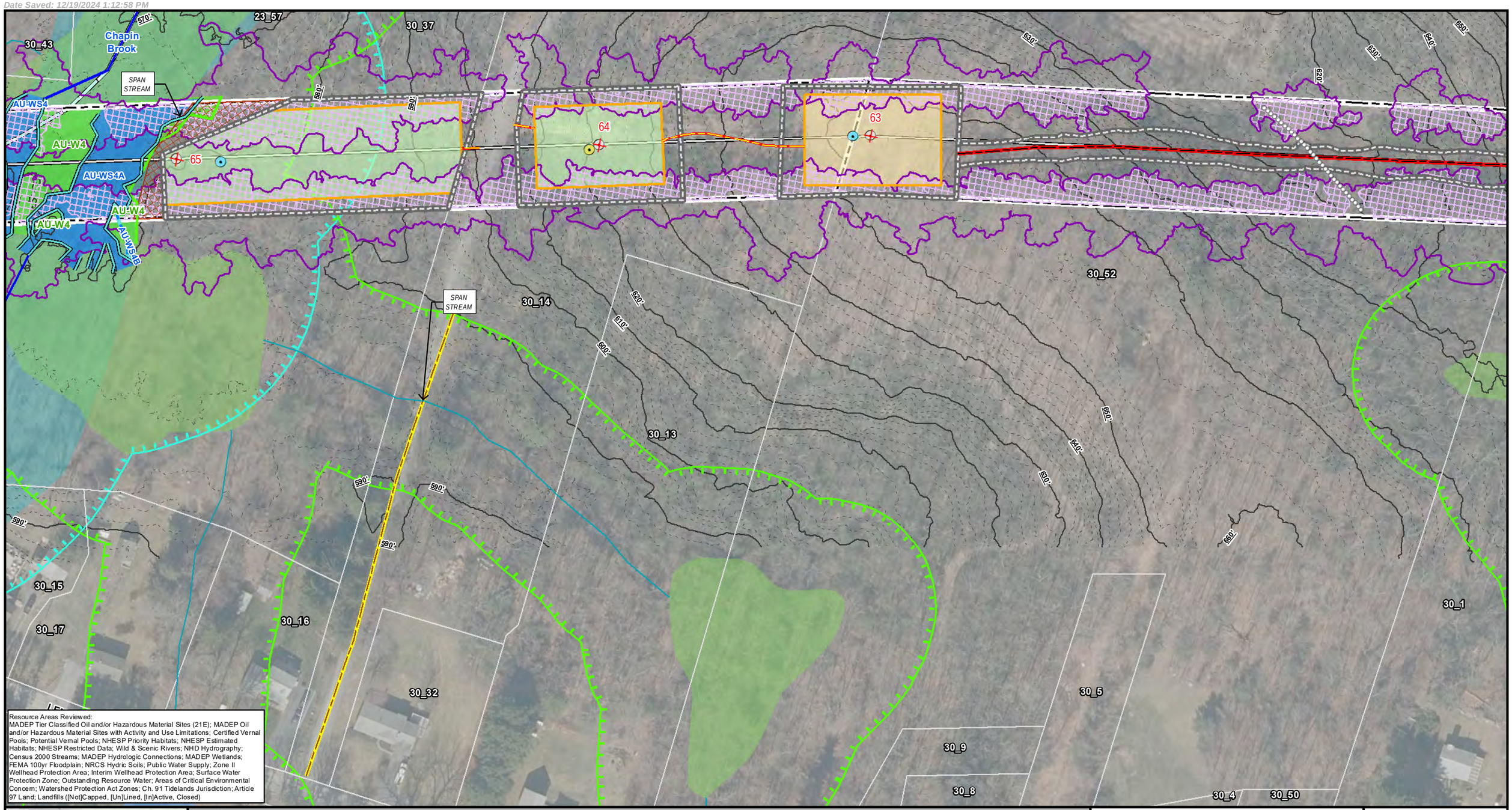

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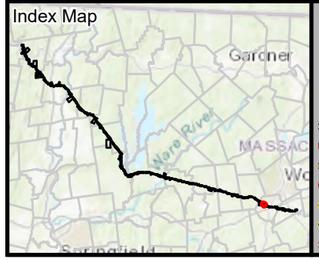

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Auburn, MA

MassGIS
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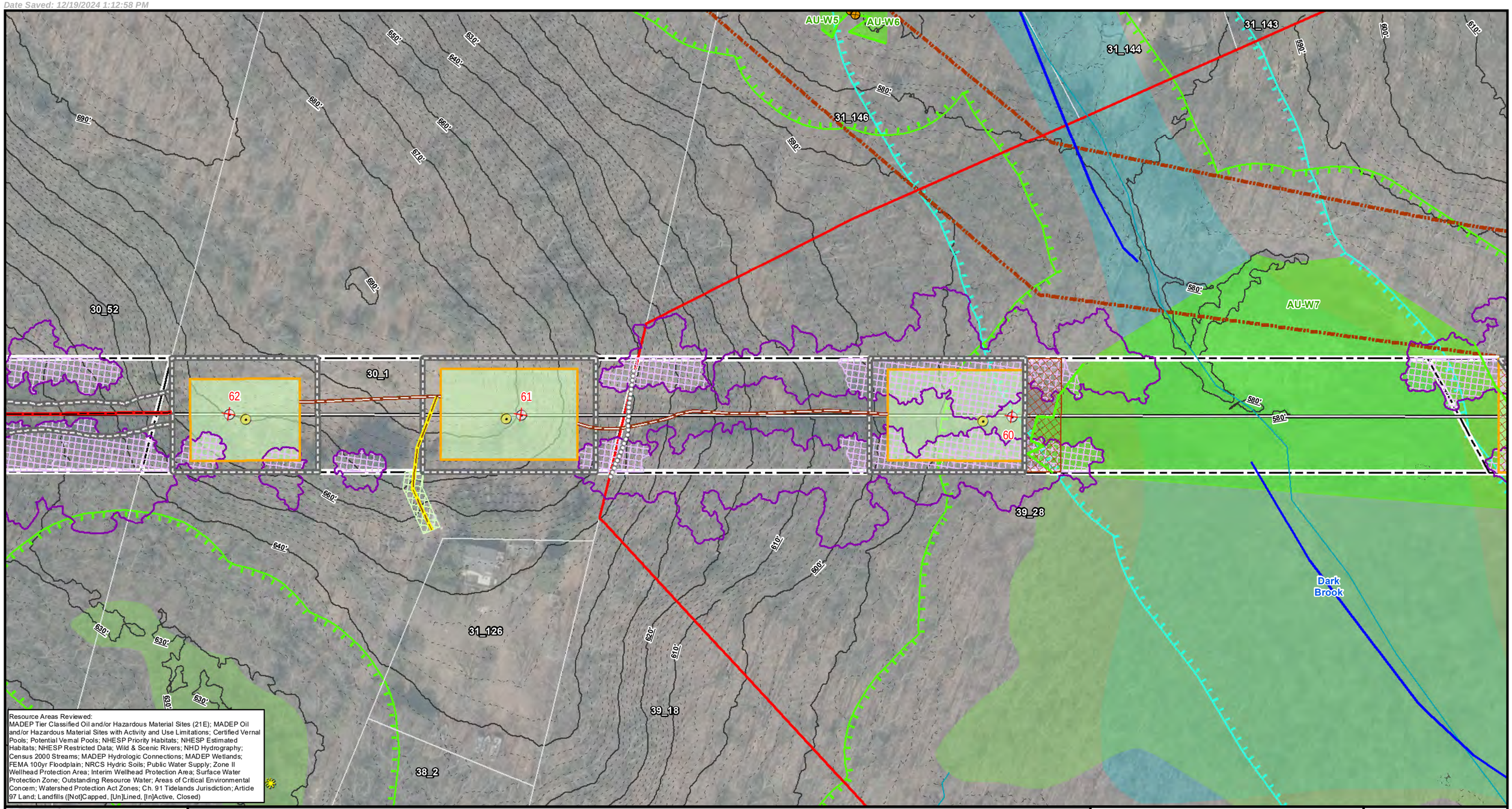

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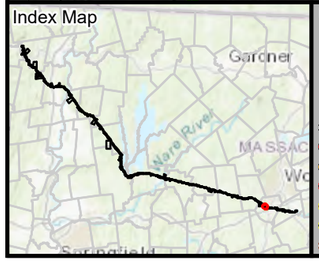

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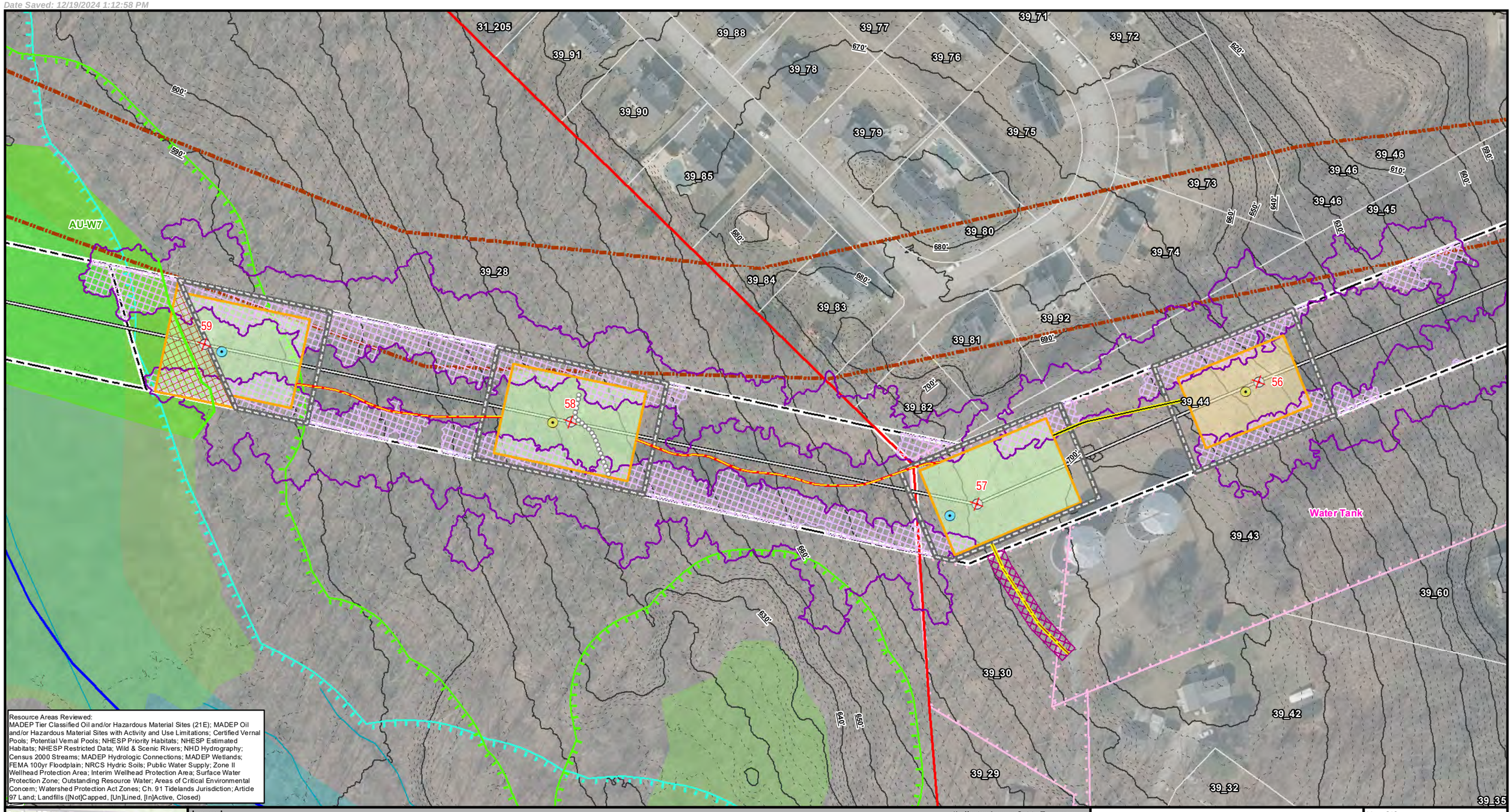

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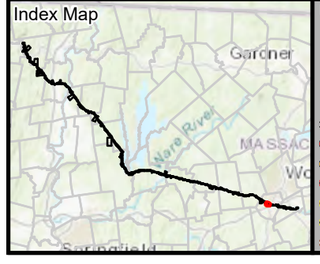

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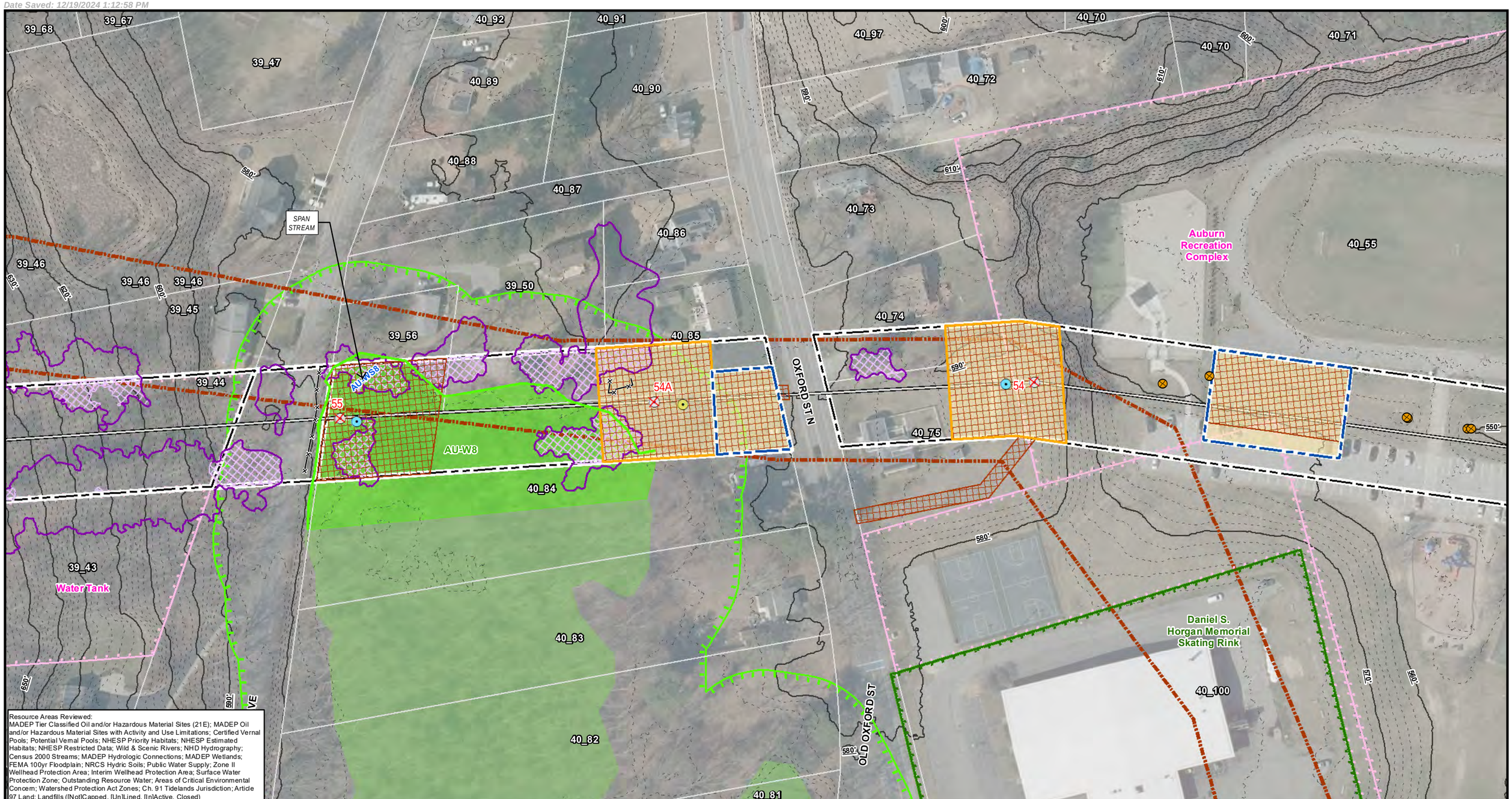

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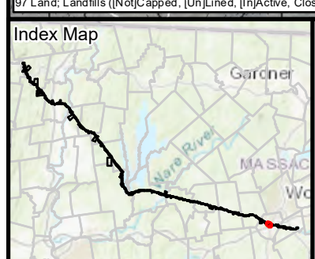

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Auburn Recreation Complex

BRAYMAN ST

SOUTHBRIDGE ST

I-290

I-90

Dark Brook

AU-S1

53

52

40_71 40_55 40_107 40_48 40_49 40_50 40_51 40_52 40_45 40_44 40_43 40_42 40_41 40_38 40_39 40_40 40_32 40_31

290 12 90

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Gardner

Springfield

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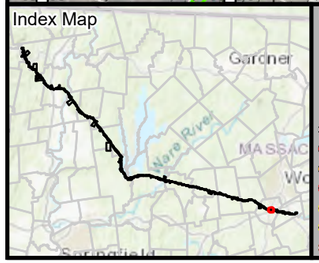

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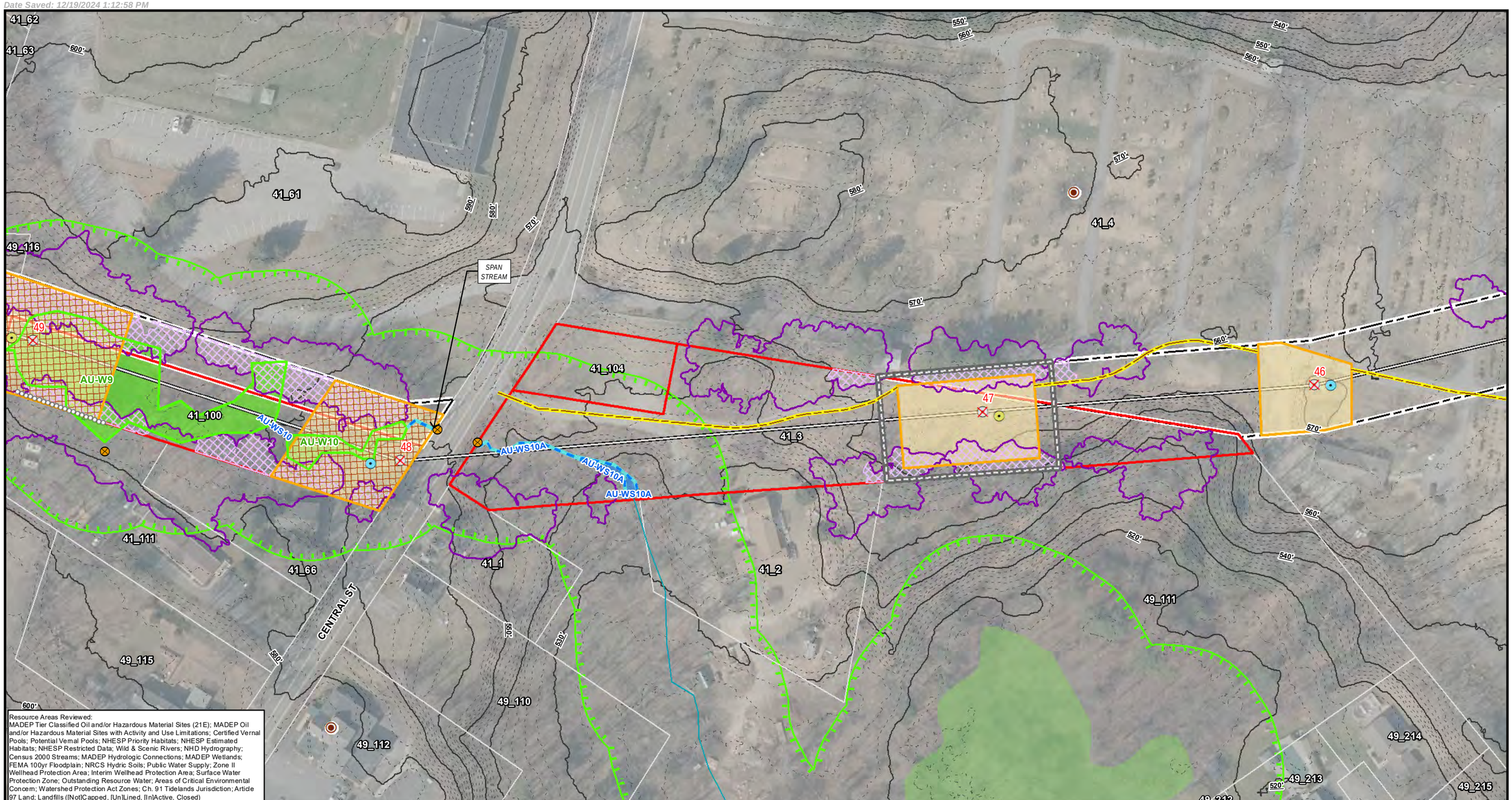

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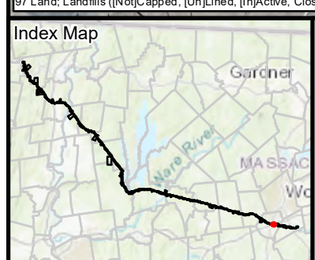

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N

1 inch = 100 feet

0 50 100

Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Auburn, MA
Page 223 of 240

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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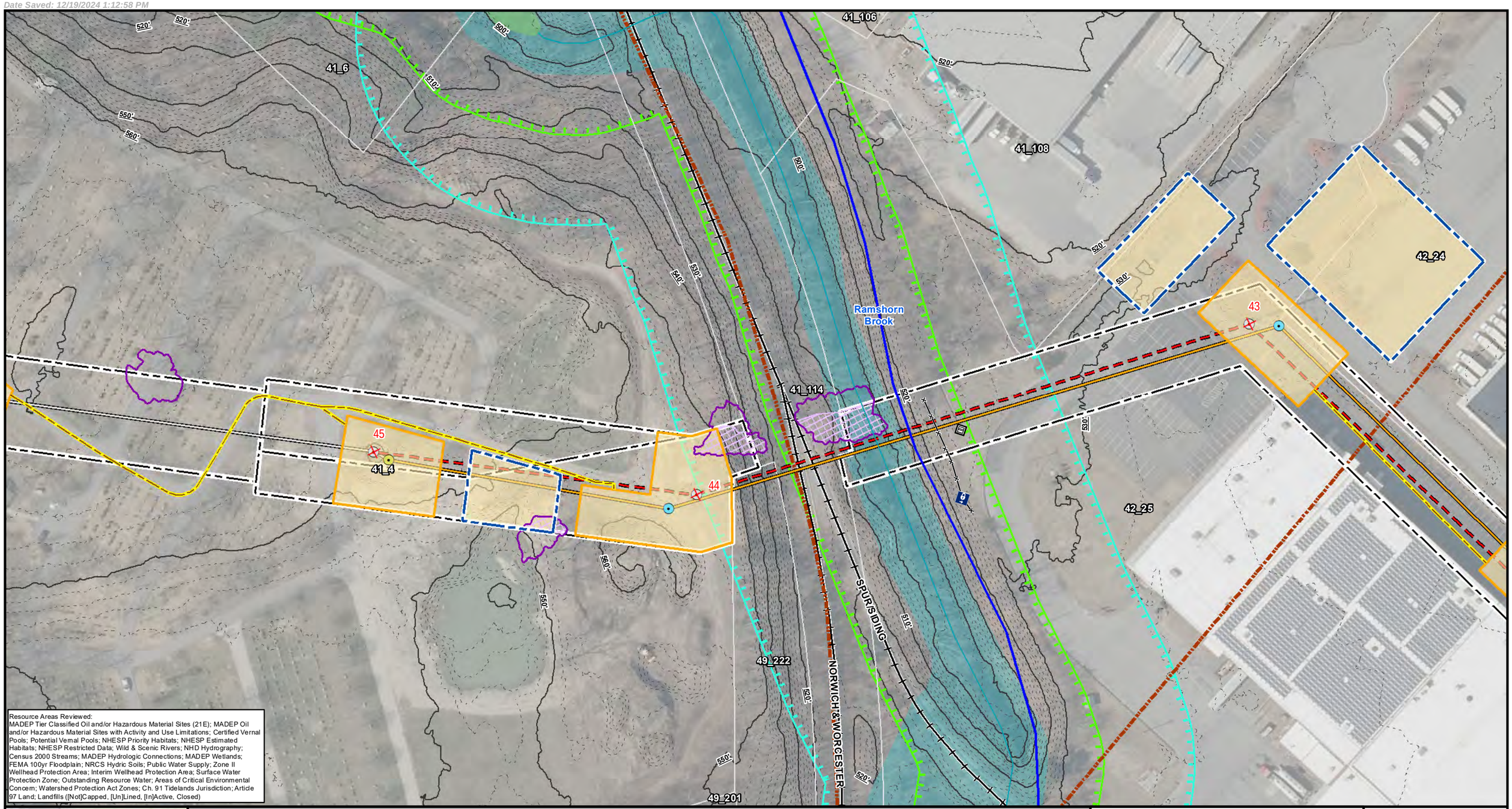

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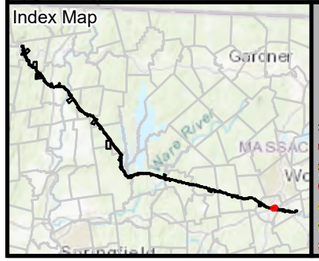

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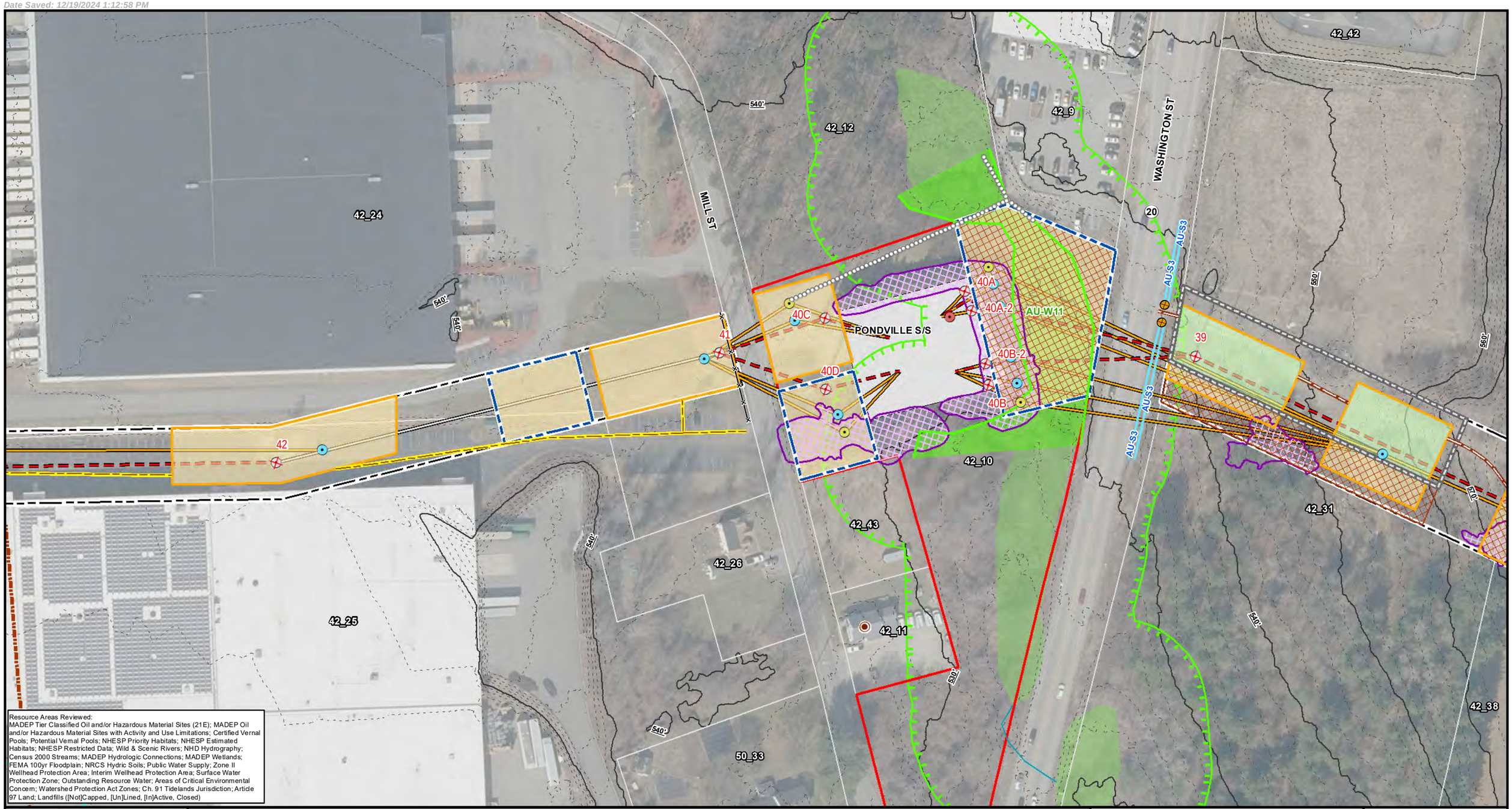

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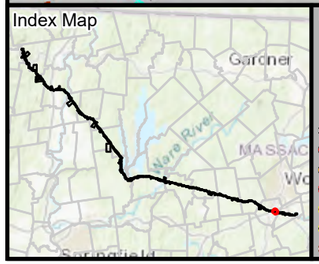

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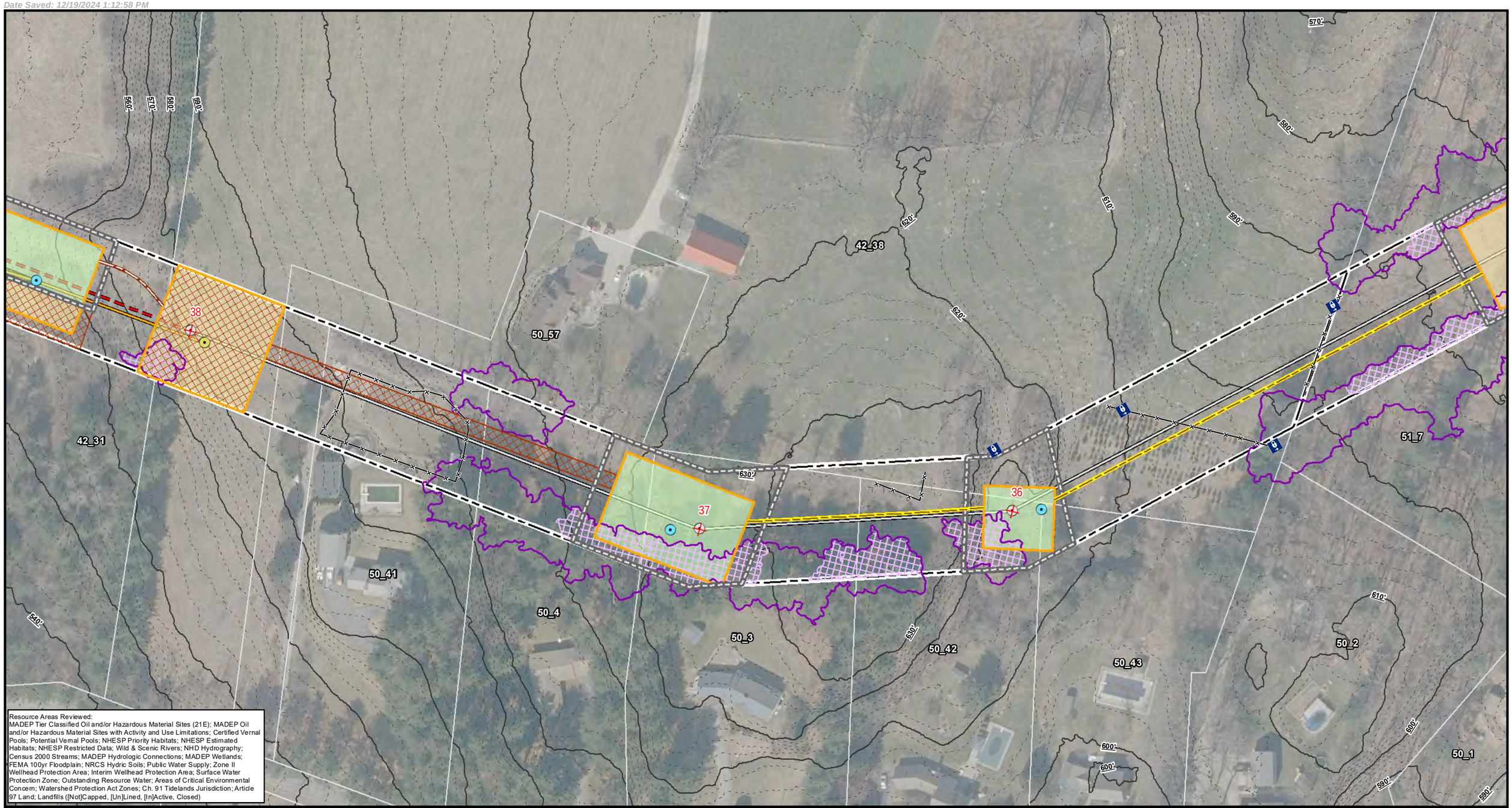

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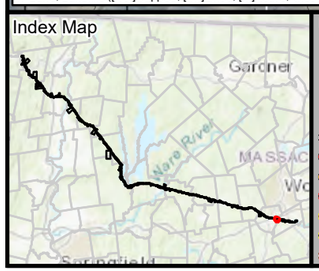

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Auburn, MA

MassGIS
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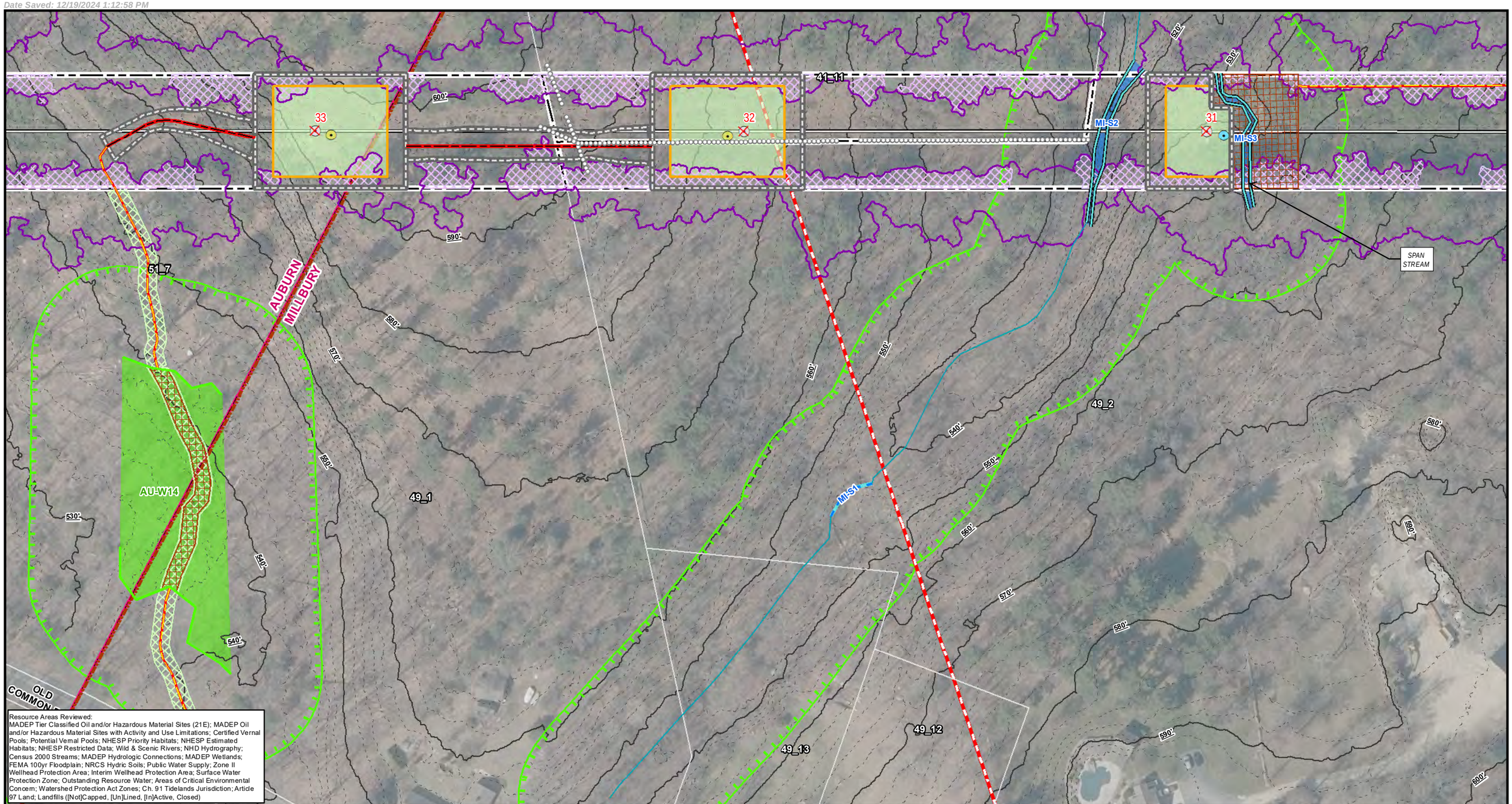

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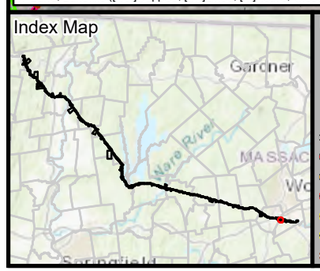

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Auburn & Millbury, MA

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SPAN STREAM

SPAN STREAM

MI-WS1B

MI-W2

MI-WS2

MI-WS1

MI-W1

49_2

50_5

30

29

28

530'
540'
550'
560'
570'
580'
590'
600'
610'
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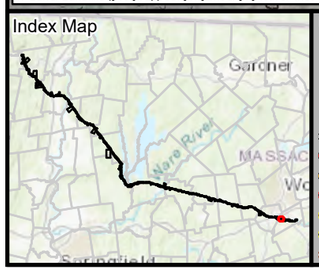

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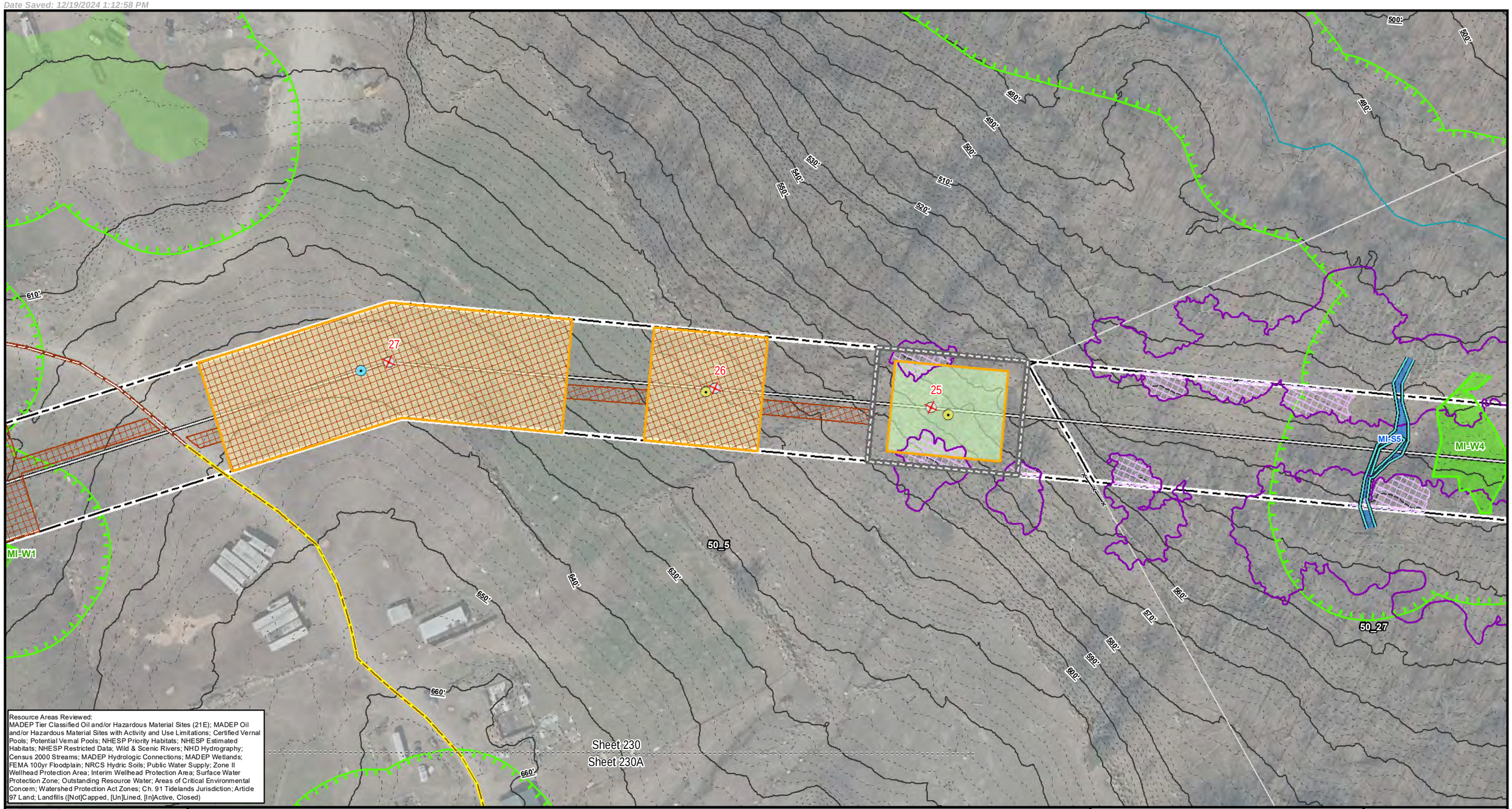

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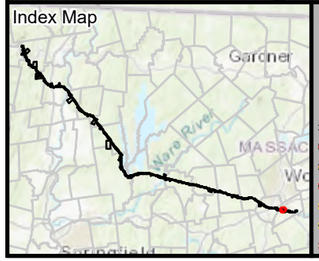

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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Millbury, MA

MassGIS
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DWINELL RD

SPAN STREAM

50_5

51_3

51_57

50_7

50_8

Sheet 231
Sheet 231A

51_60

51_59

MI-S5

MI-W4

MI-W5

MI-W6

MI-WS5

MI-WS5A

MI-WS6

22

23

24

610'
600'
590'
580'
570'
560'
550'
540'
530'
520'
510'
500'
490'

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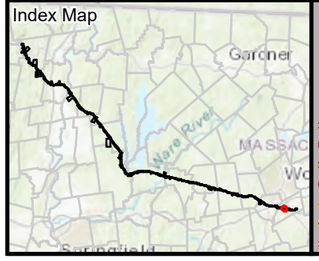

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Sheet 231
Sheet 231A

DWINELL RD
AUBURN RD

MI-W7
MI-W8

Stowe Meadows Conservation Area

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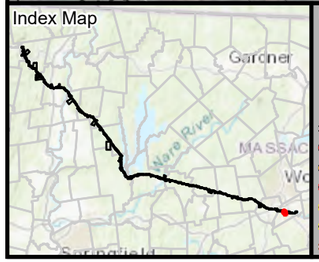

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Environmental Resources Map

Millbury, MA
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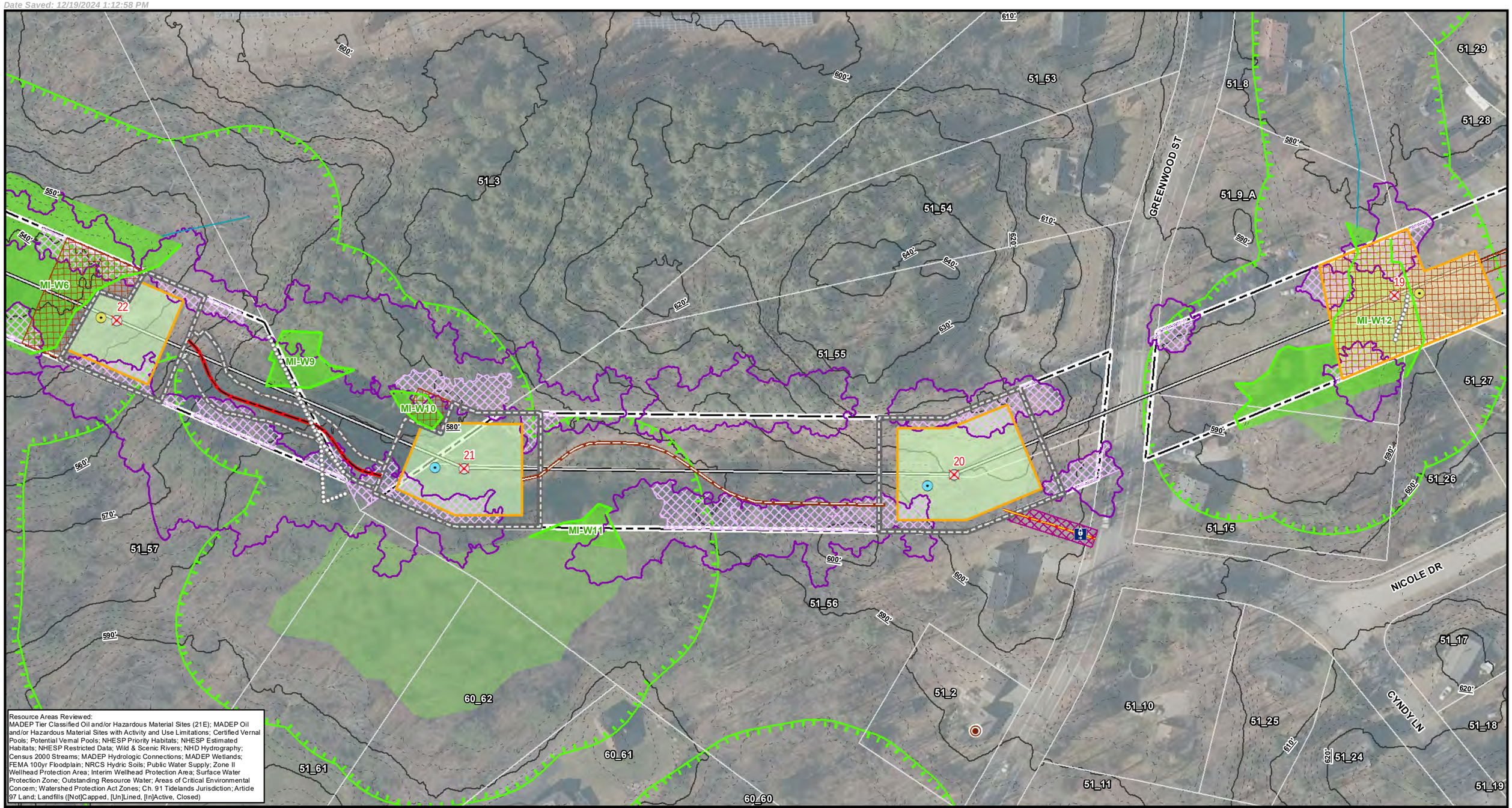

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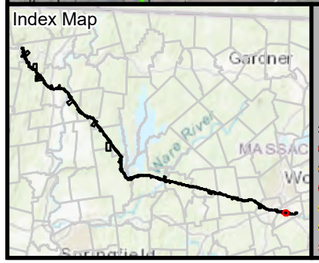

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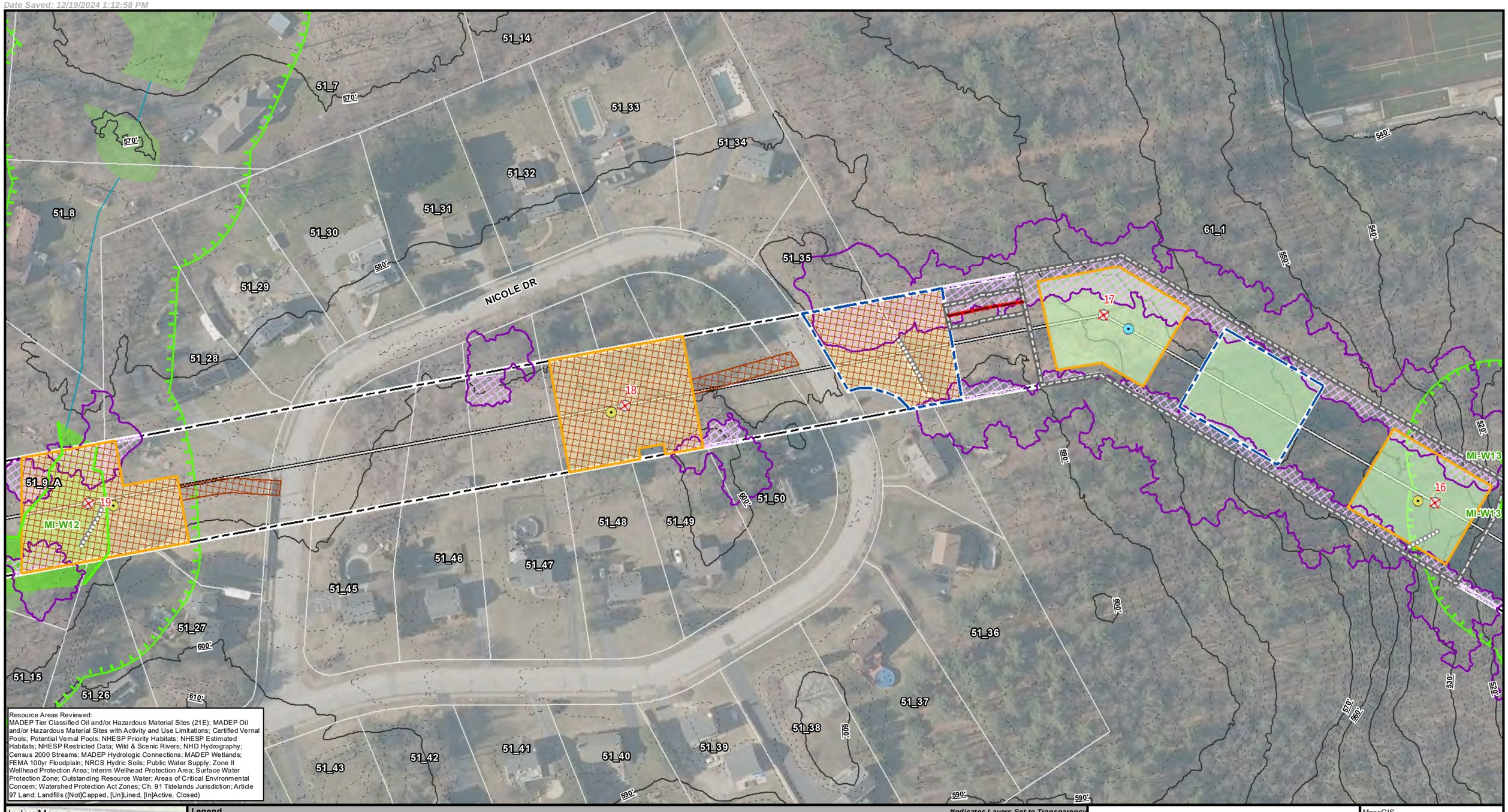

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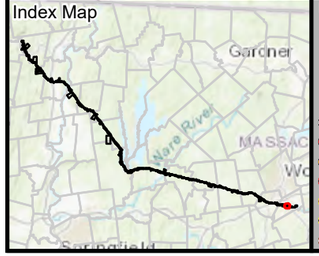

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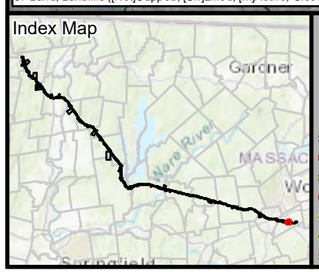

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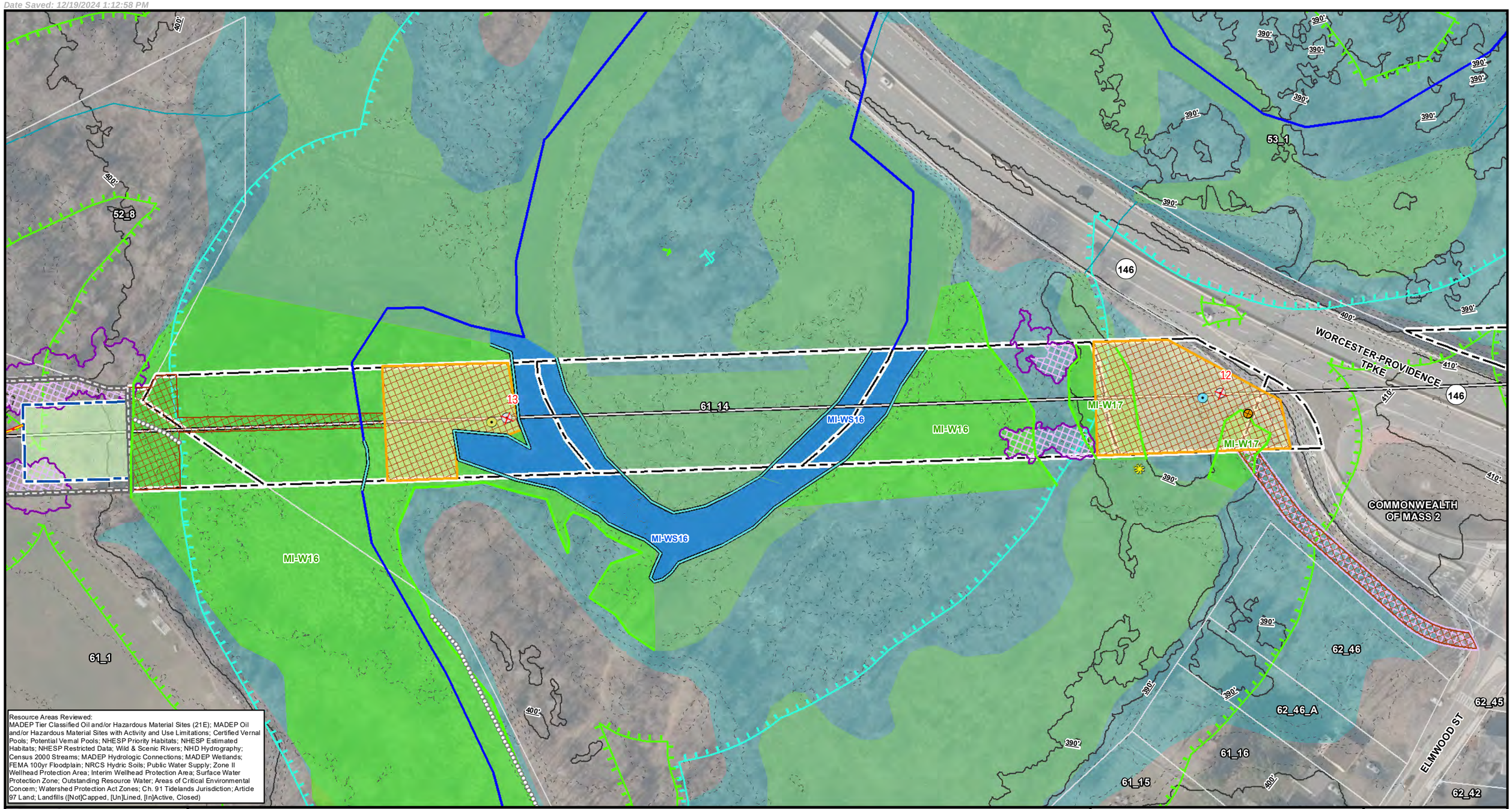

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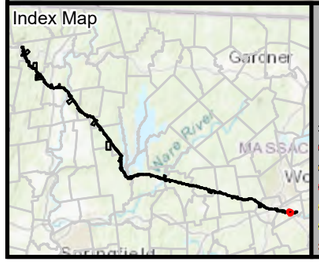

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Environmental Resources Map

Millbury, MA

MassGIS
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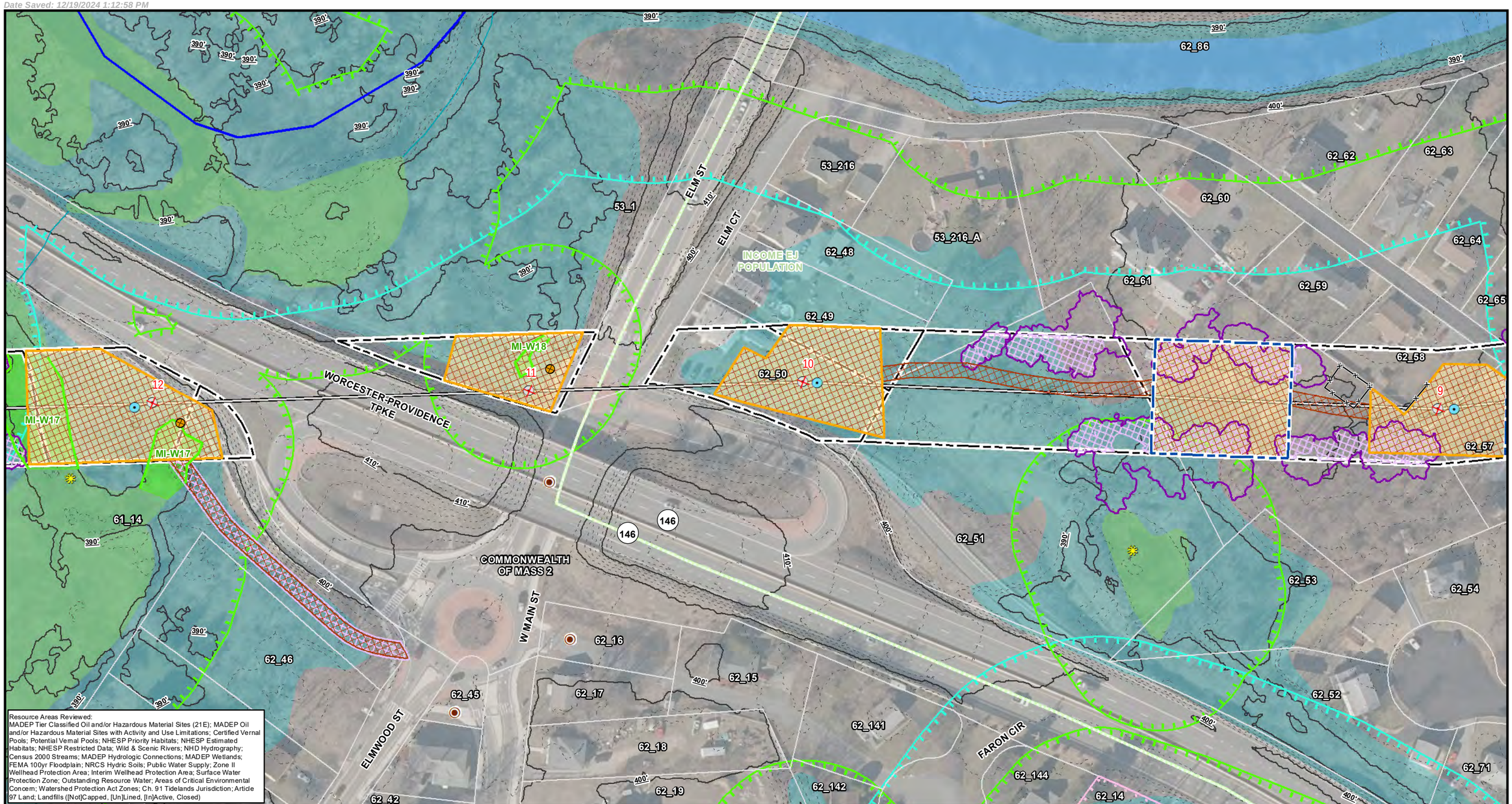

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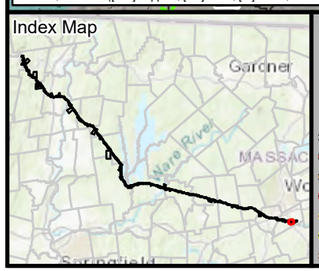

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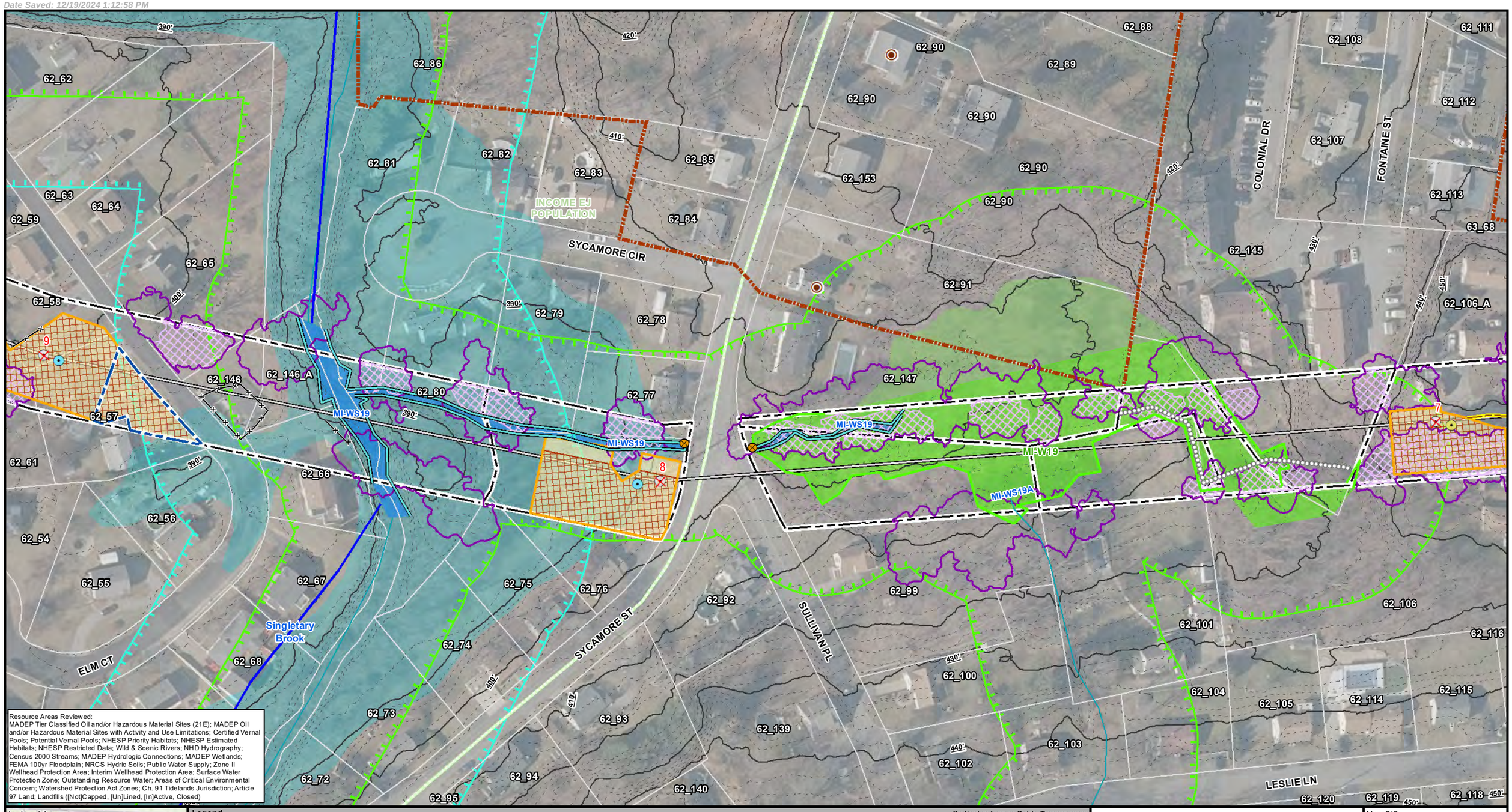

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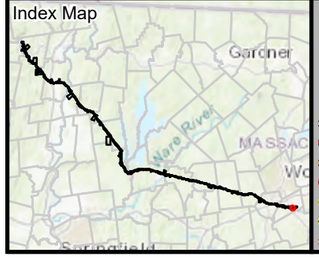

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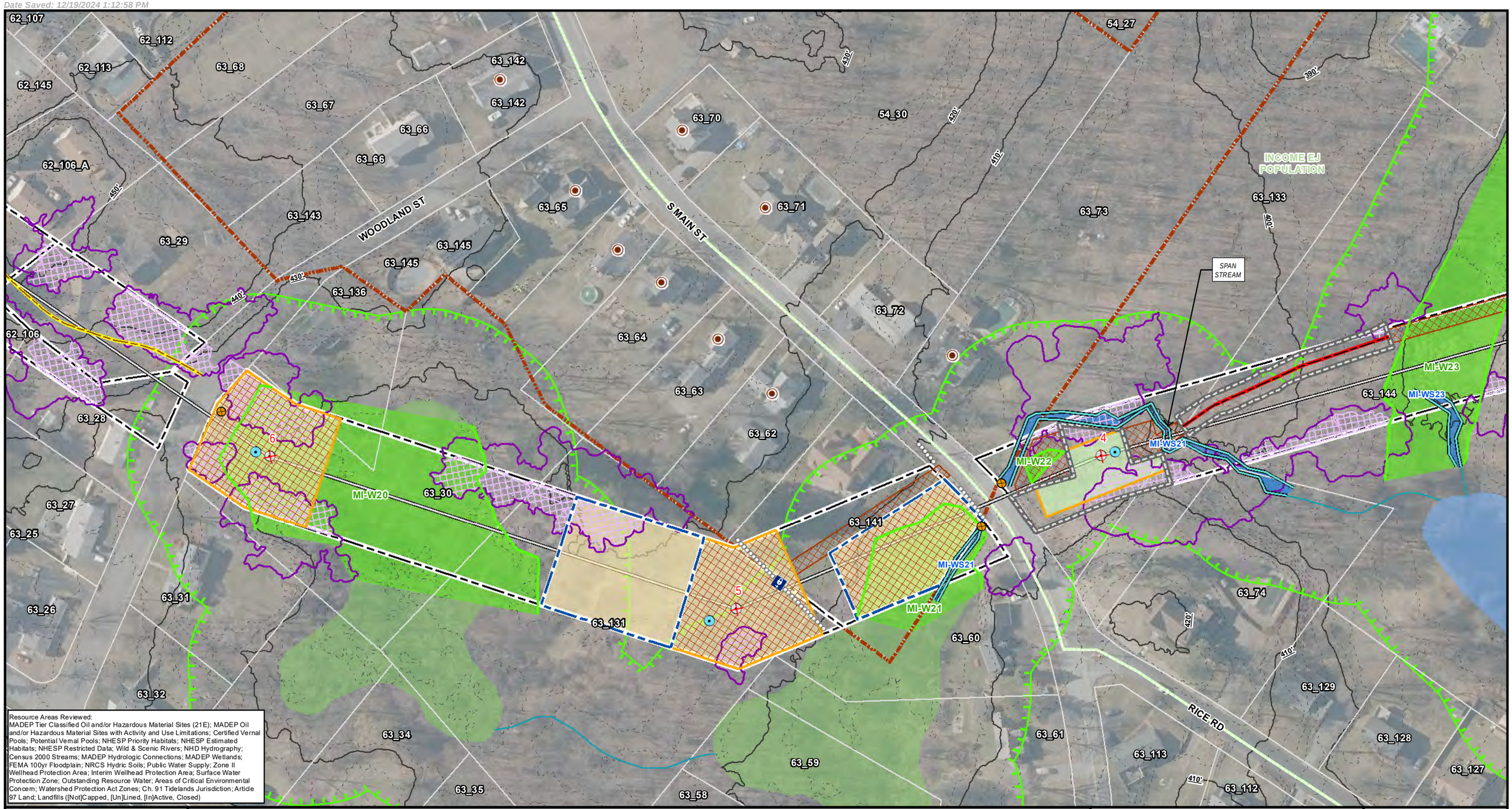

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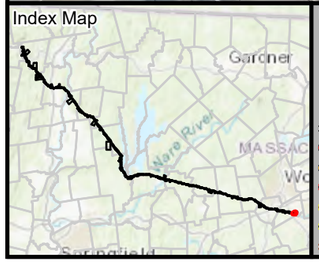

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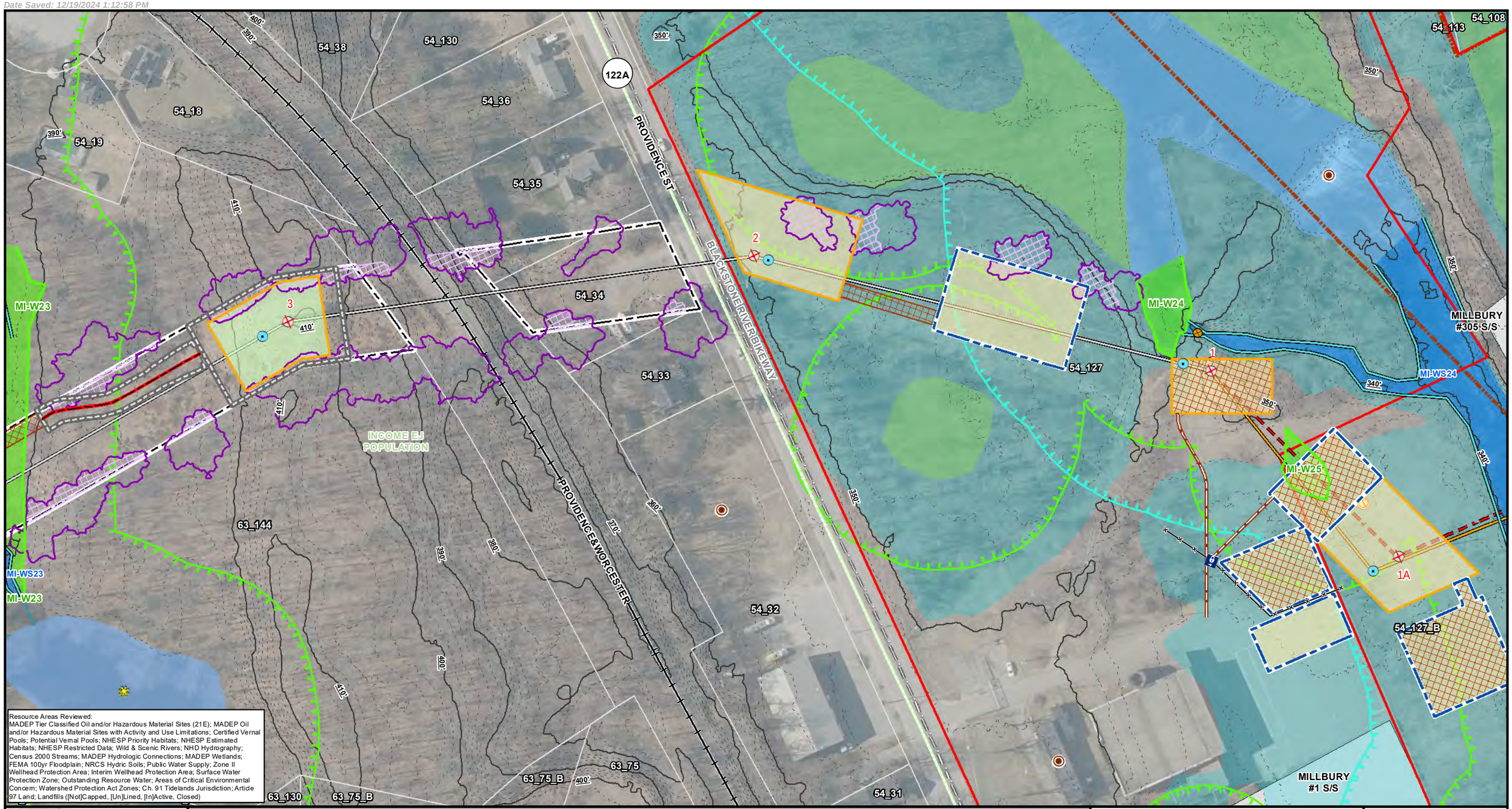

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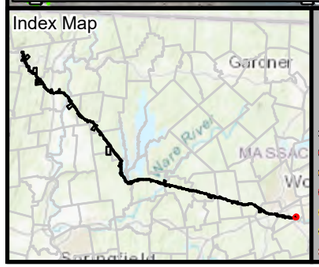

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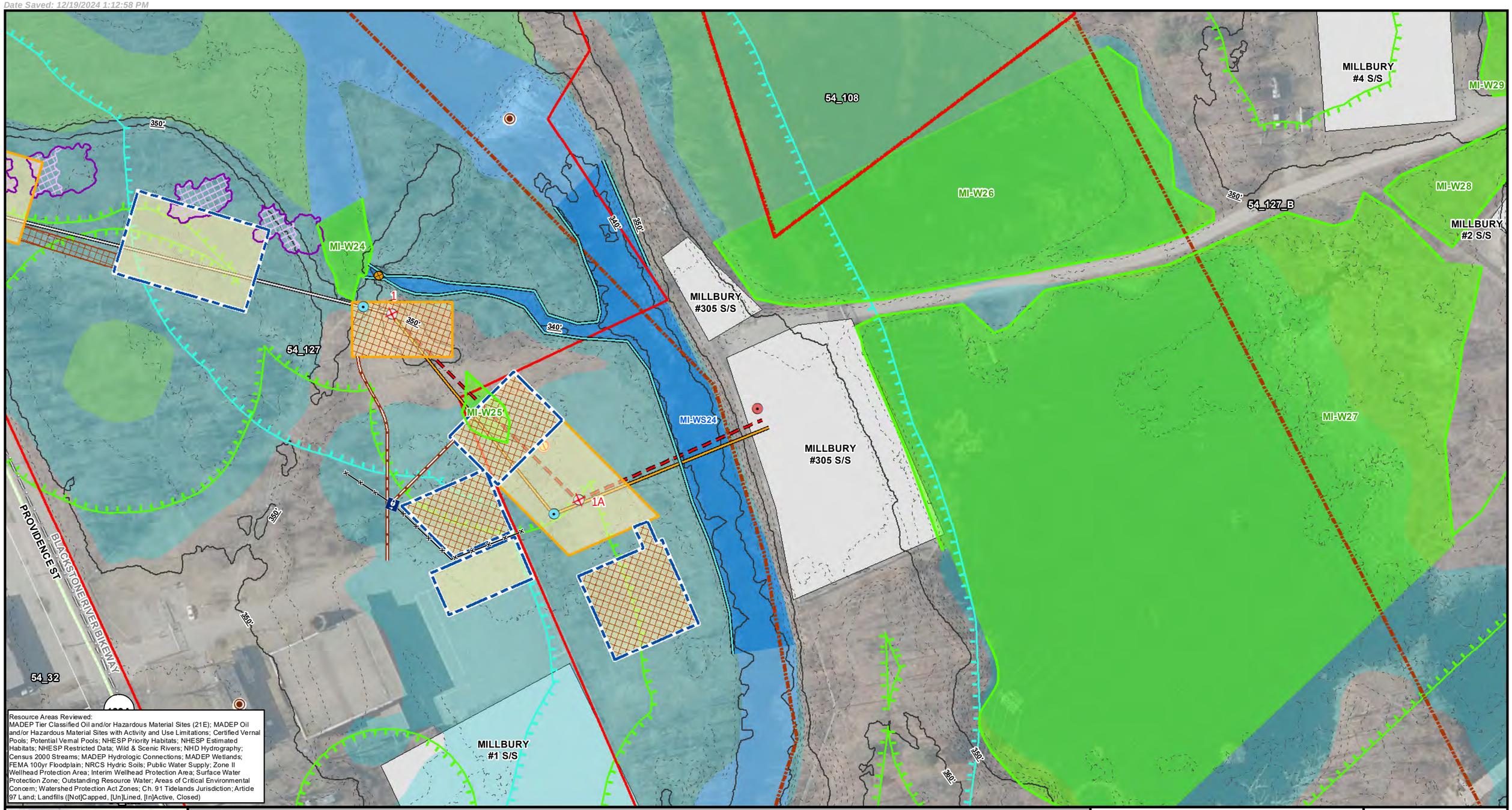

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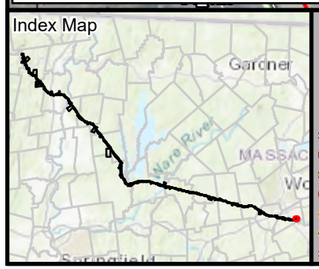

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Appendix A – Figures and Plans
Figure 3 – Water Supply Protection Areas

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BSC Project Number: 100181.00

Central to Western Massachusetts Energy Improvement Project

Shelburne, Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn & Millbury, MA
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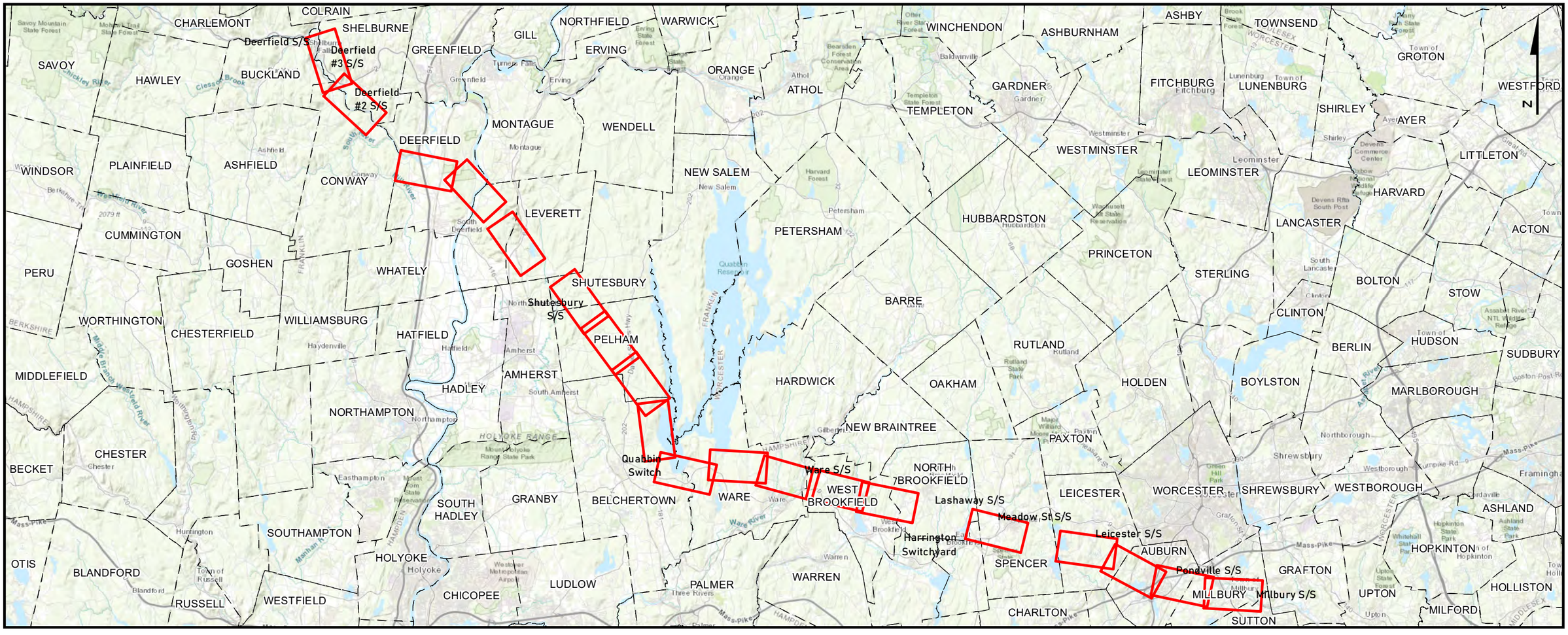
December 13, 2024



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1 - 19 - MAP SHEETS

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nationalgrid

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Waltham, MA 02451

PREPARED BY:

BSC GROUP

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Worcester, MA 01608

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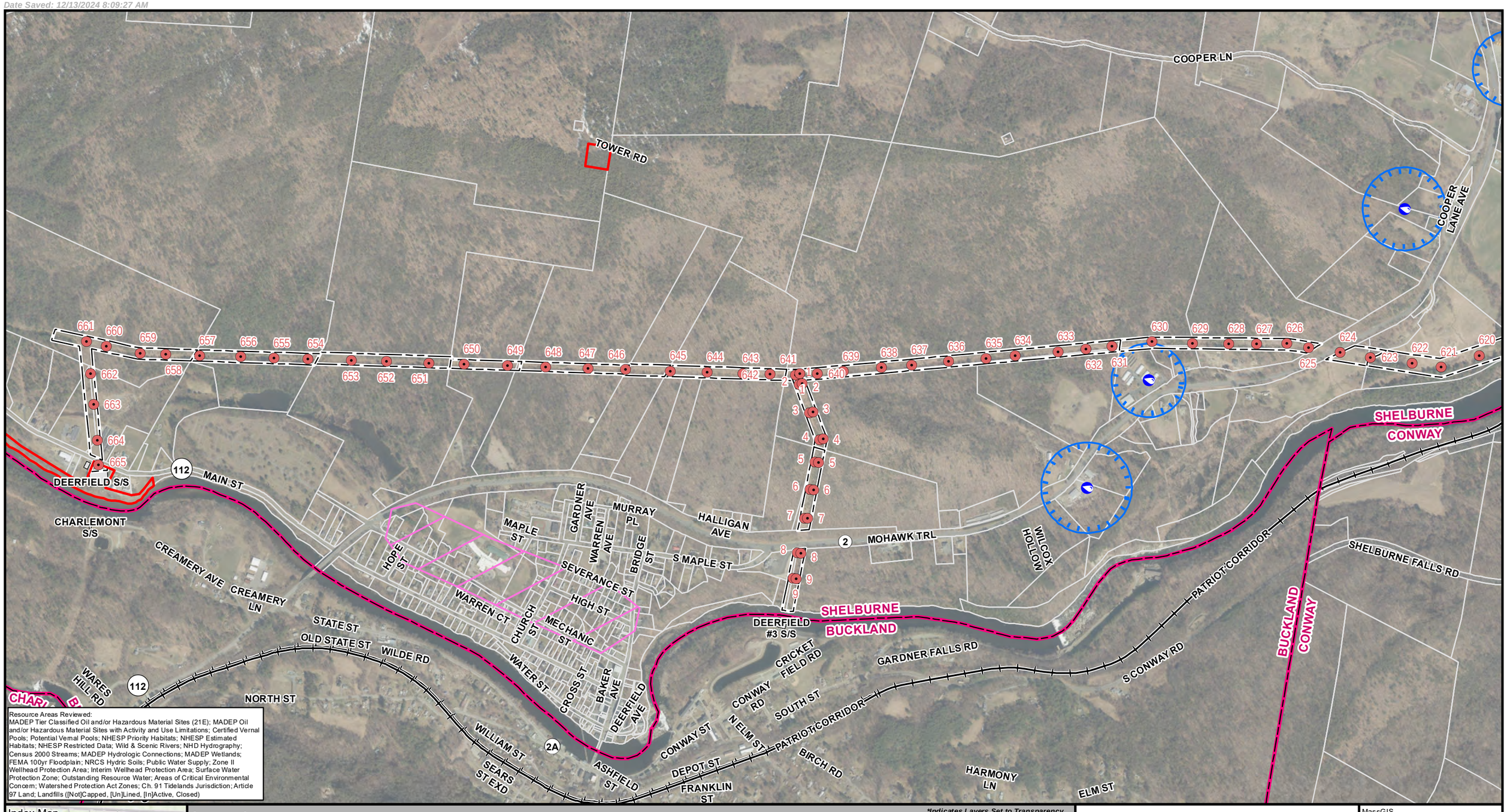

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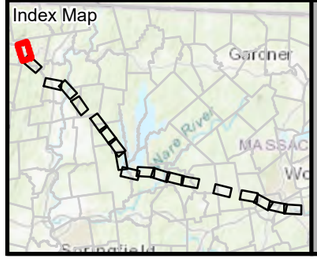

Legend

- Existing Structure
- Edge of ROW
- National Grid Owned Property
- Public Water Supply
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- Surface Water (Active or Inactive)
- Aquifer
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- Parcel Boundaries
- Railroad

*Indicates Layers Set to Transparency

N

1 inch = 1,000 feet

0 500 1,000
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Shelburne, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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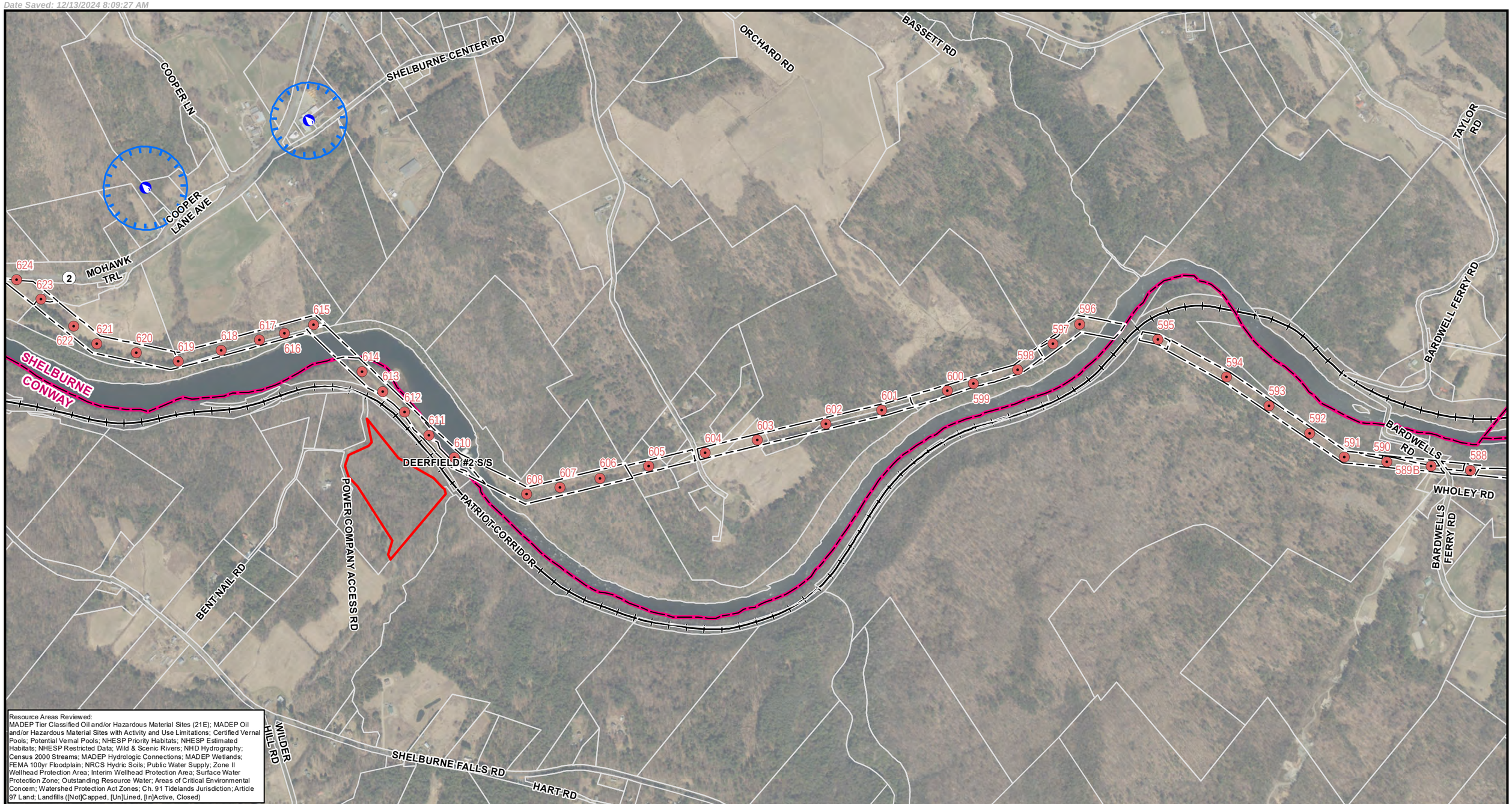

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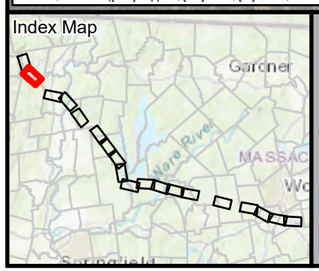

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Water Supply Protection Areas

Shelburne & Conway, MA

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PATRIOT CORRIDOR
UPPER RD
LOWER RD
STILLWATER RD
HOOSAC RD
I-91
WELLS CROSS RD
CHILDS CROSS RD
STEAM MILL RD
HIKING TRL
GREENFIELD RD
CONN RIVER MAIN LINE
MEADOW OAK LN
TYLER WAY
DUNCAN DR
SANDGULLY RD
ALLEN DR
LEE RD
ADAMS CT
HERITAGE WAY
MILL VILLAGE RD
CLARK CROSS RD
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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Deerfield, MA

MassGIS
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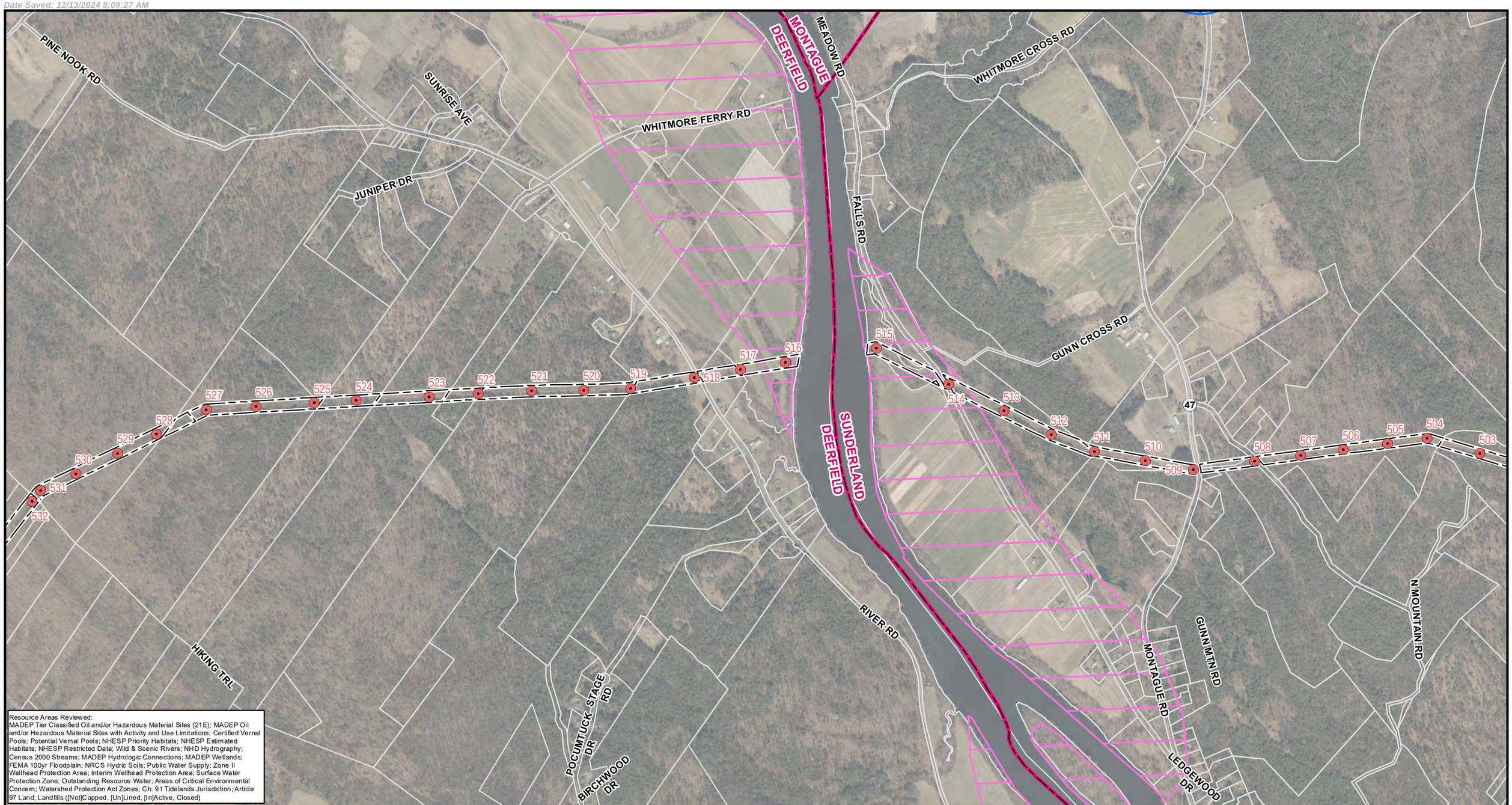

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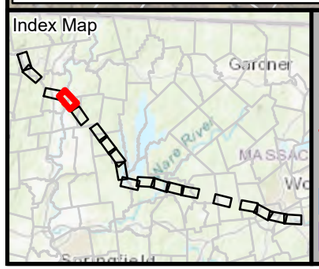

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Deerfield & Sunderland, MA

MassGIS
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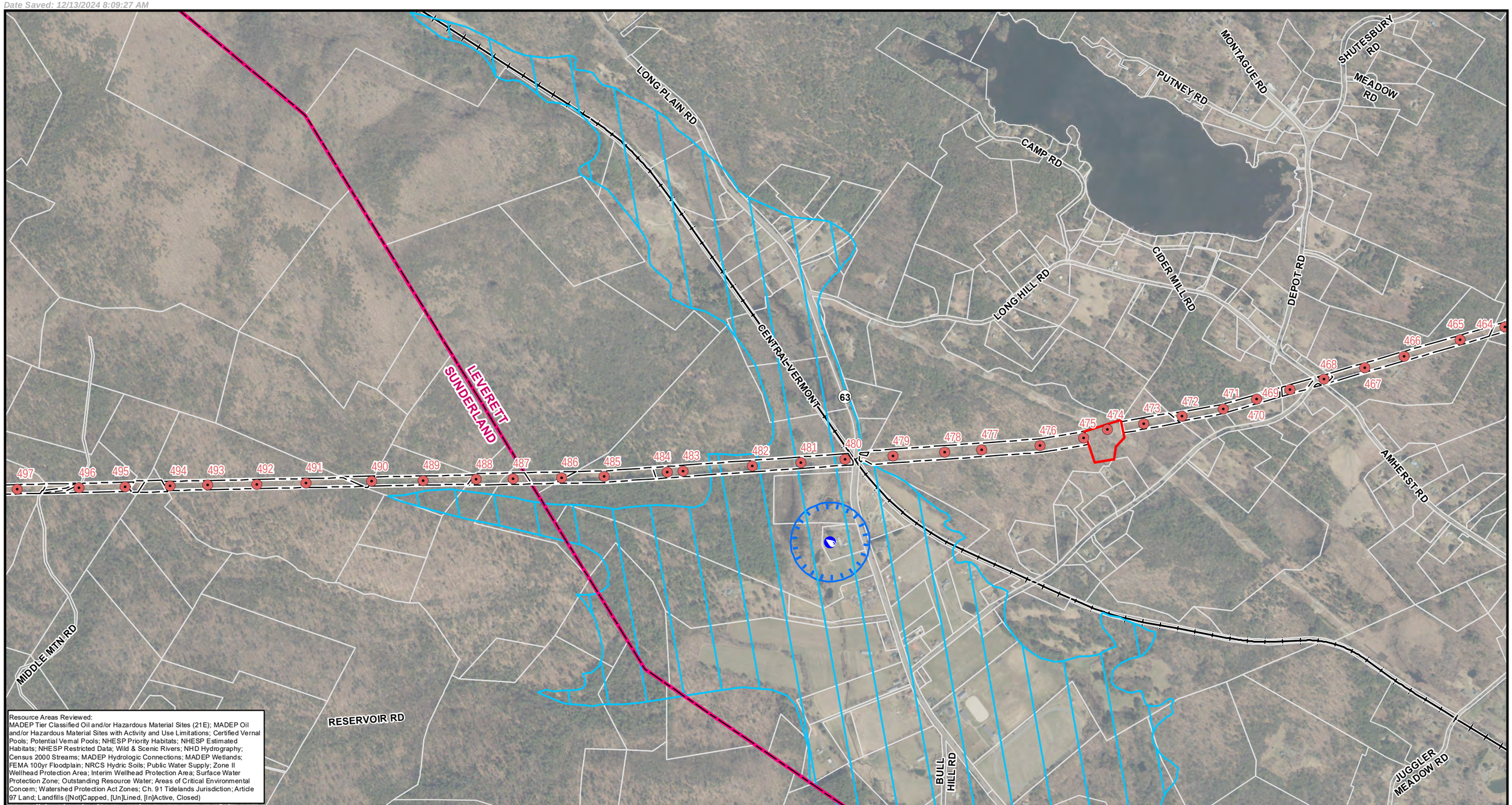

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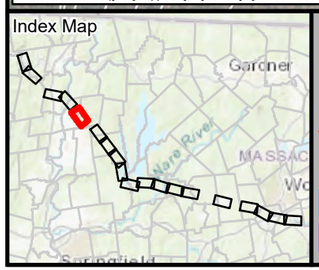

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Sunderland & Leverett, MA

MassGIS
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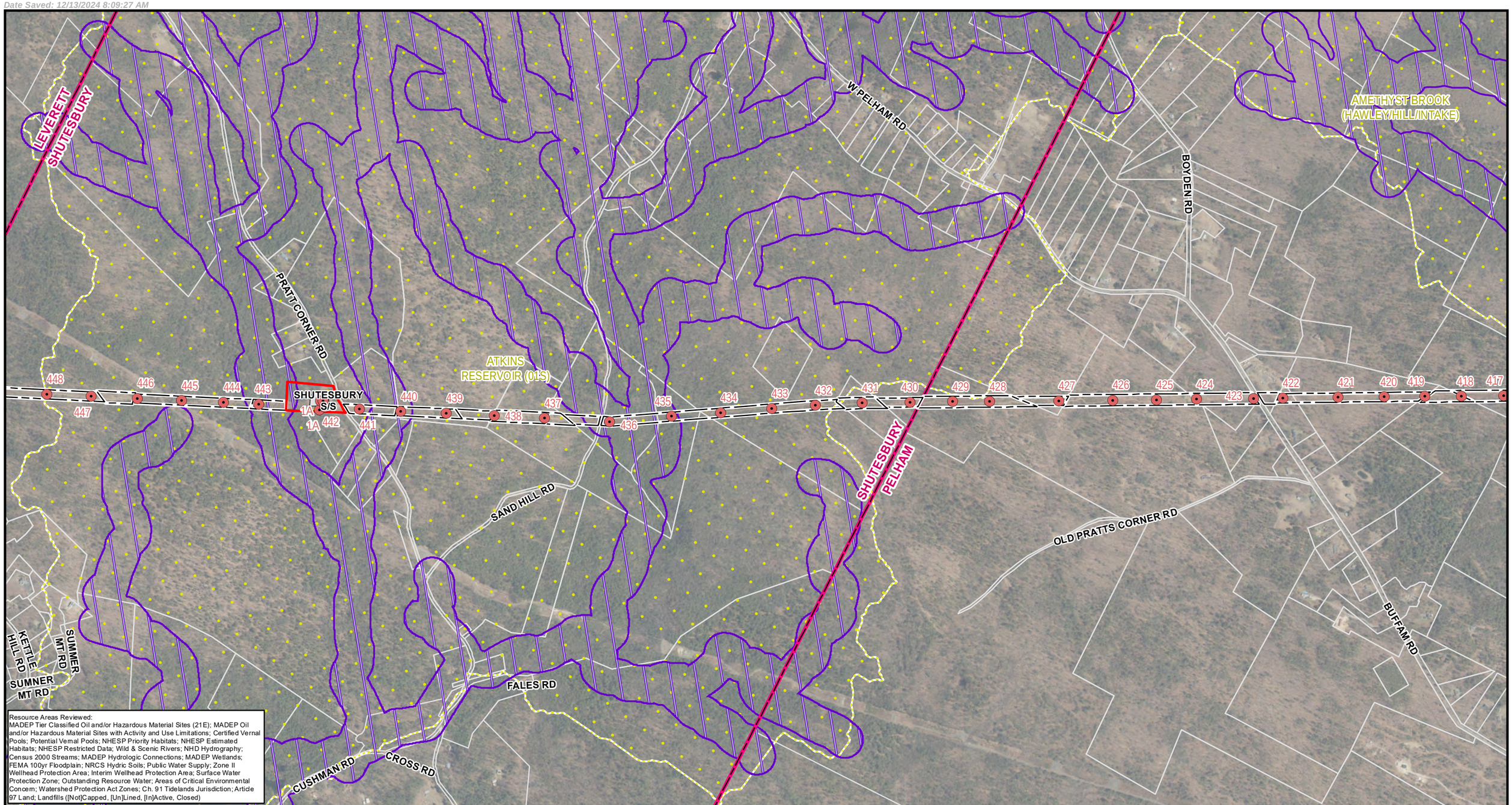

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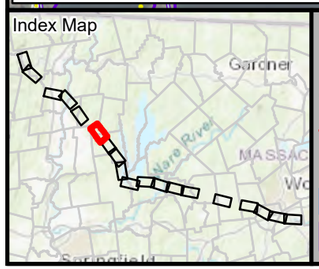

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Shutesbury & Pelham, MA

MassGIS
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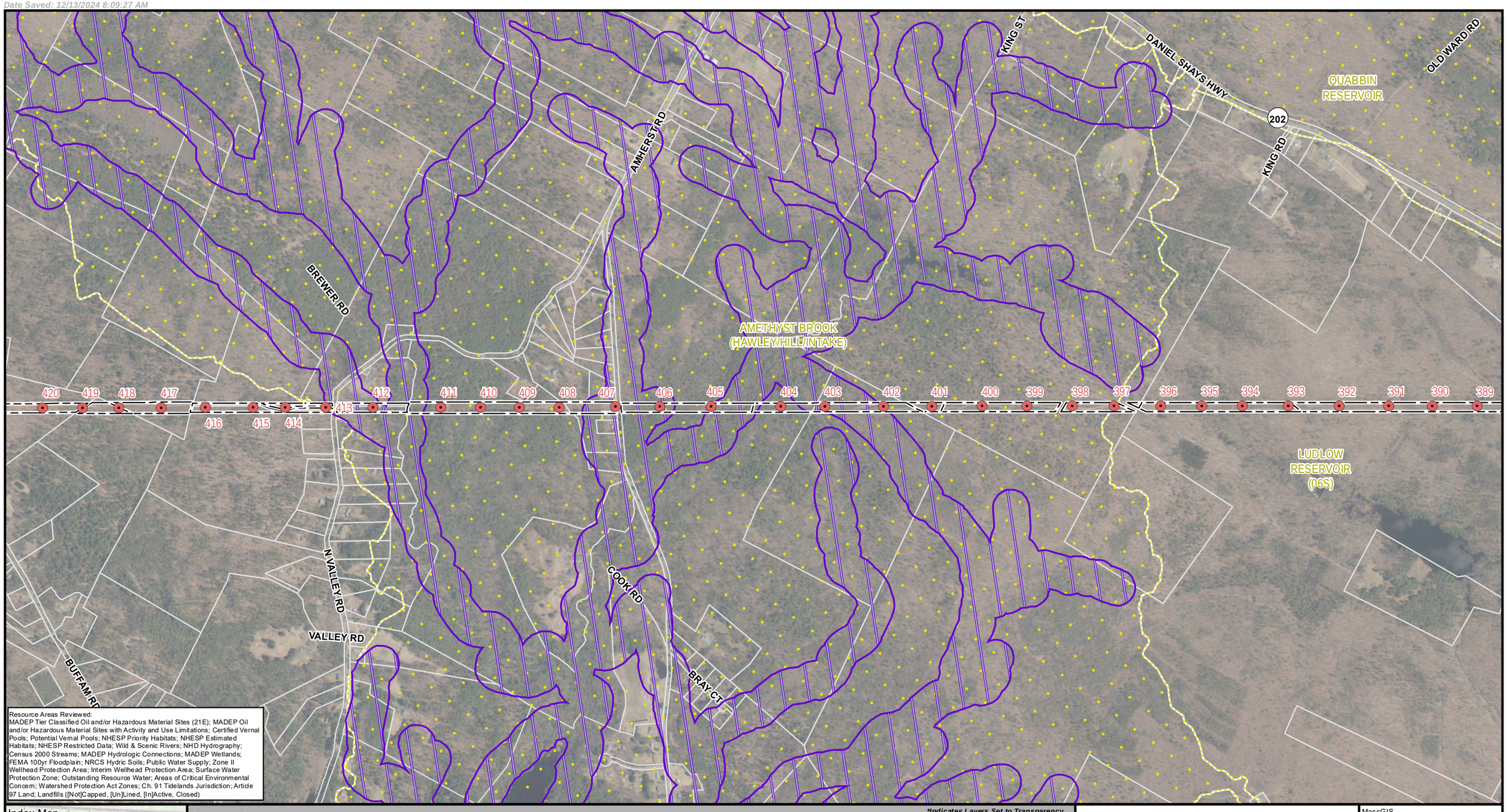

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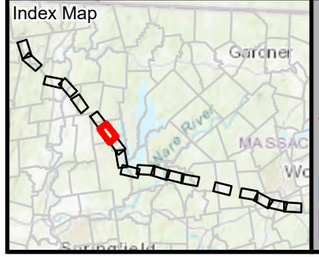

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Pelham, MA

MassGIS
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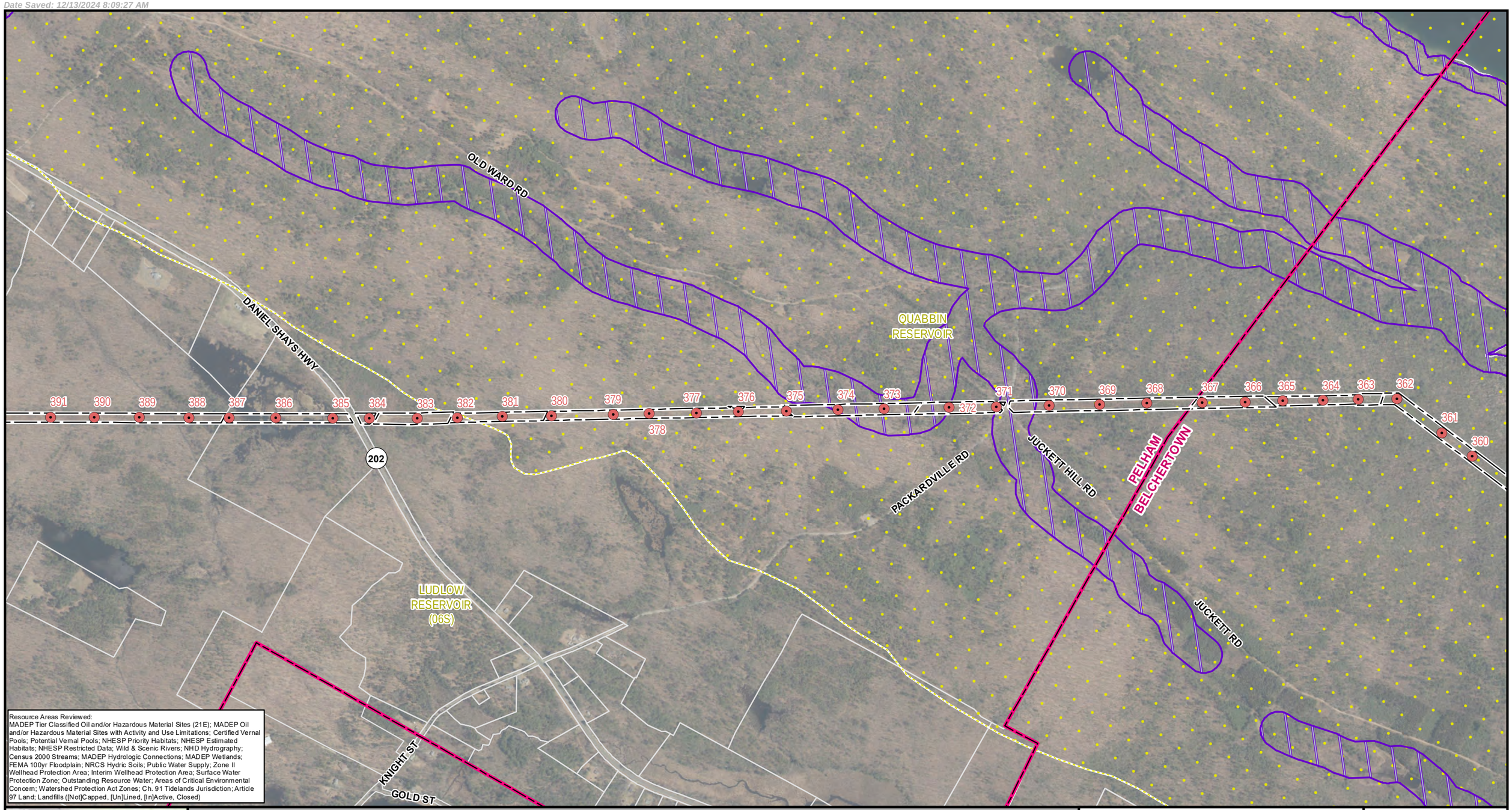

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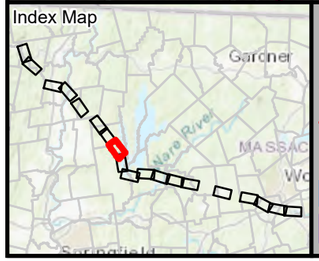

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Water Supply Protection Areas

Pelham & Belchertown, MA

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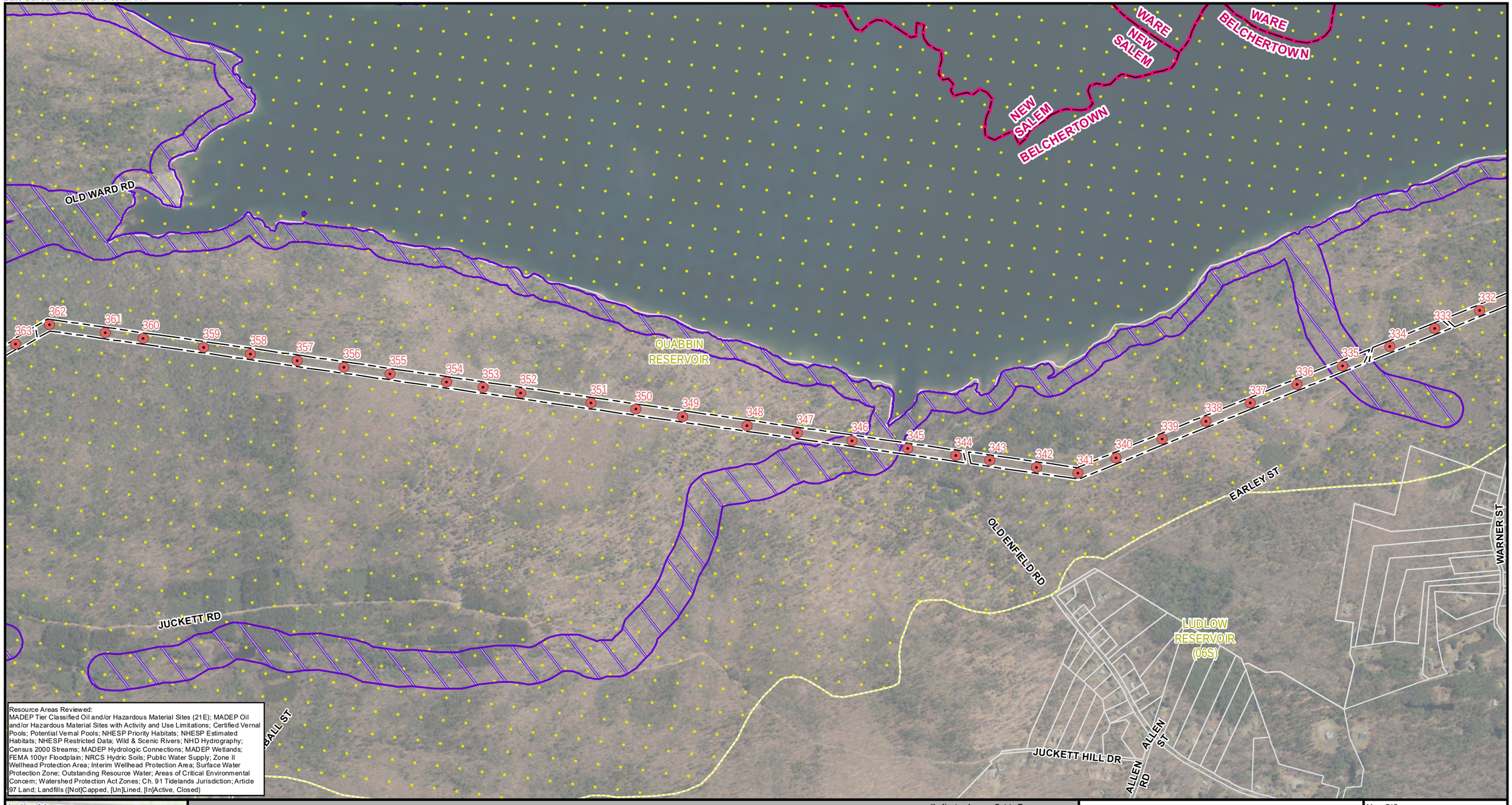

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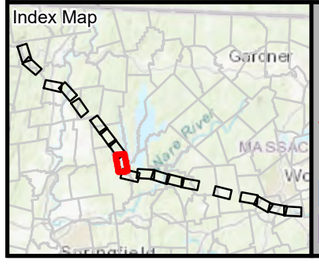

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Belchertown, MA

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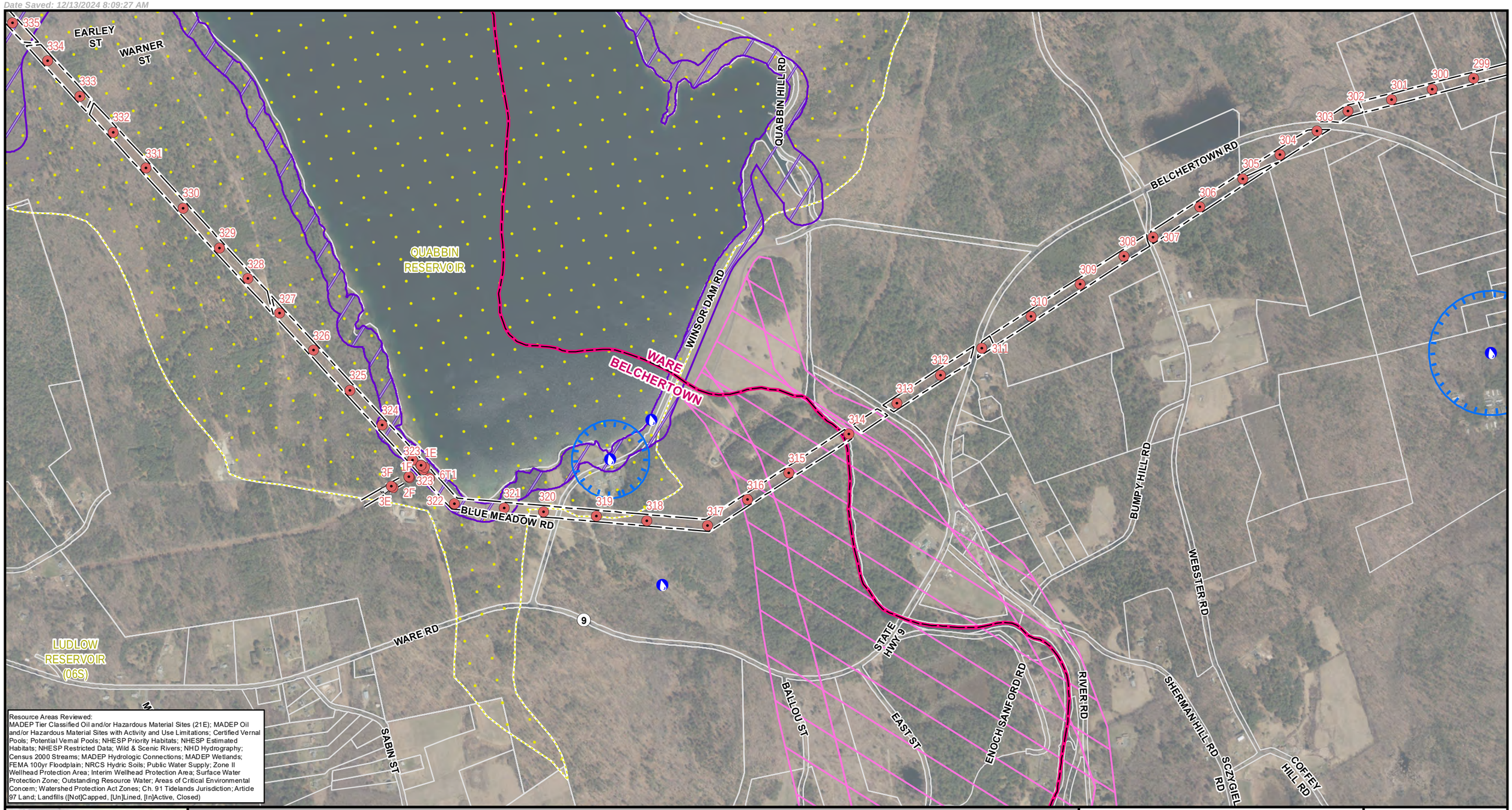

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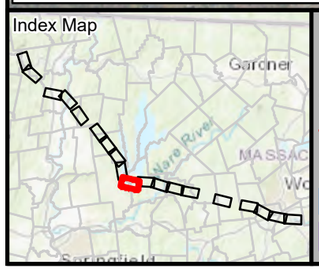

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Water Supply Protection Areas

Belchertown & Ware, MA

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QUABBIN RESERVOIR
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TURNPIKE RD
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GREENWICH PLNS RD
OLD POOR FARM RD
OSBORNE RD
FISHERDICK RD
GREENWICH PLAINS RD
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CUMMINGS RD
WINSLOW RD
WALKER RD
CRESCENT ST
BELCHERTOWN RD
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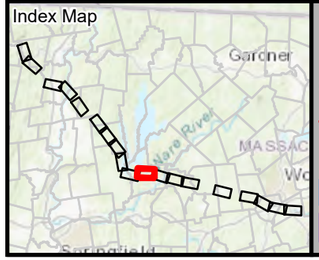
Index Map



Legend

- Existing Structure
- Edge of ROW
- National Grid Owned Property
- Public Water Supply
- Interim Wellhead Protection Area
- Surface Water Protection Zone
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- Surface Water (Active or Inactive)
- Aquifer
- Town Boundary
- Parcel Boundaries
- Railroad

*Indicates Layers Set to Transparency

N

1 inch = 1,000 feet
0 500 1,000
Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Ware, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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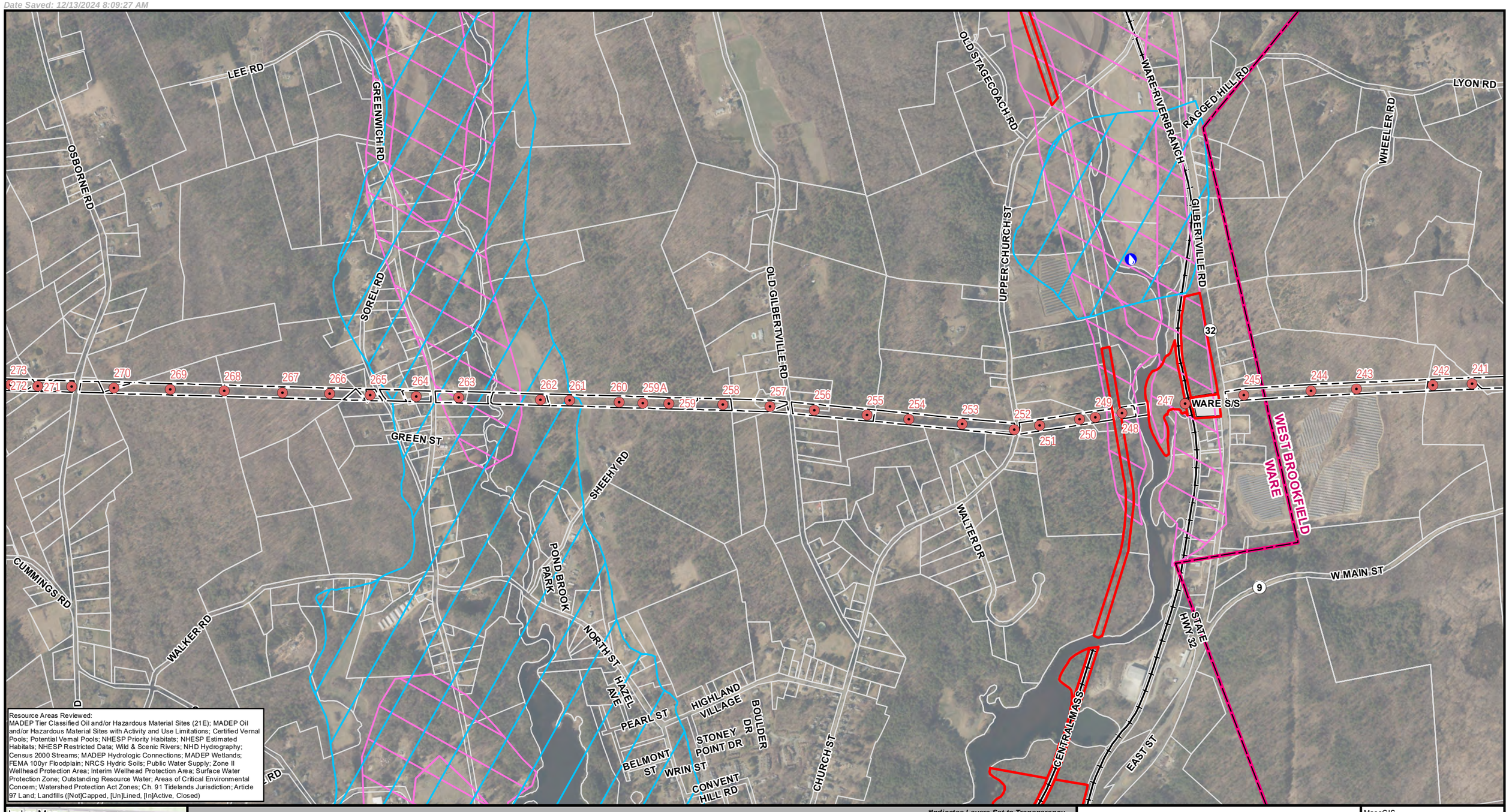

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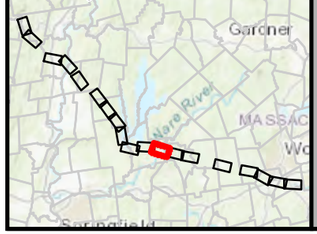

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Ware & West Brookfield, MA

MassGIS
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KENNEDY RD
LYON RD
WHEELER RD
PIERCE RD
PROUTY RD
TUCKER RD
RAGGED HILL RD
WICKABOAG VALLEY RD
MILBROOK CIR
MADDEN RD
SHEA RD
243 242 241 240 239 238 237 236 235 234 233 232 231 230 229 228 227 226 225 224 223 222 221 220 219 218 217 216 215
WHISPERING PINE DR
WHITEBIRCH DR
JUNIPER ST
HILLTOP DR
FOREST DR
CEDAR DR
HEMLOCK ST
WELCOME RD
LAKEVIEW DR
STAGECOACH RD
BROOK DR
MEADOW DR
W MAIN ST
SHORELINE DR
9
HANLEN DR
JOHN GILBERT RD
MILLSTONE RD
SNOW RD
CHECKERED LN

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

West Brookfield, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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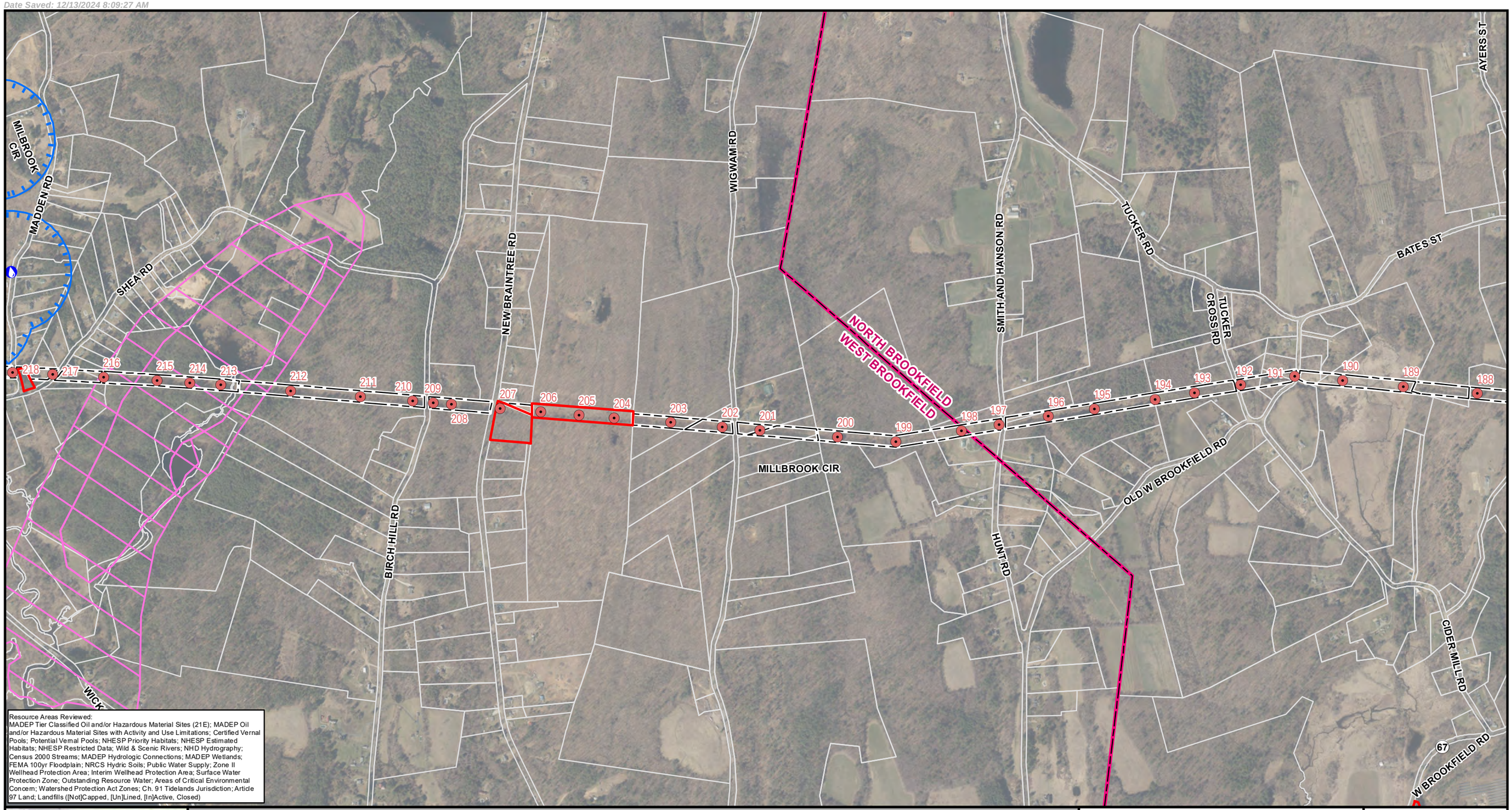

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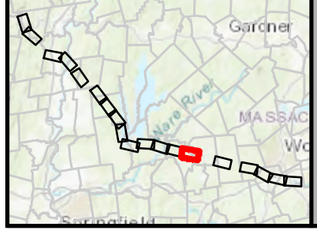

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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

West Brookfield & North Brookfield, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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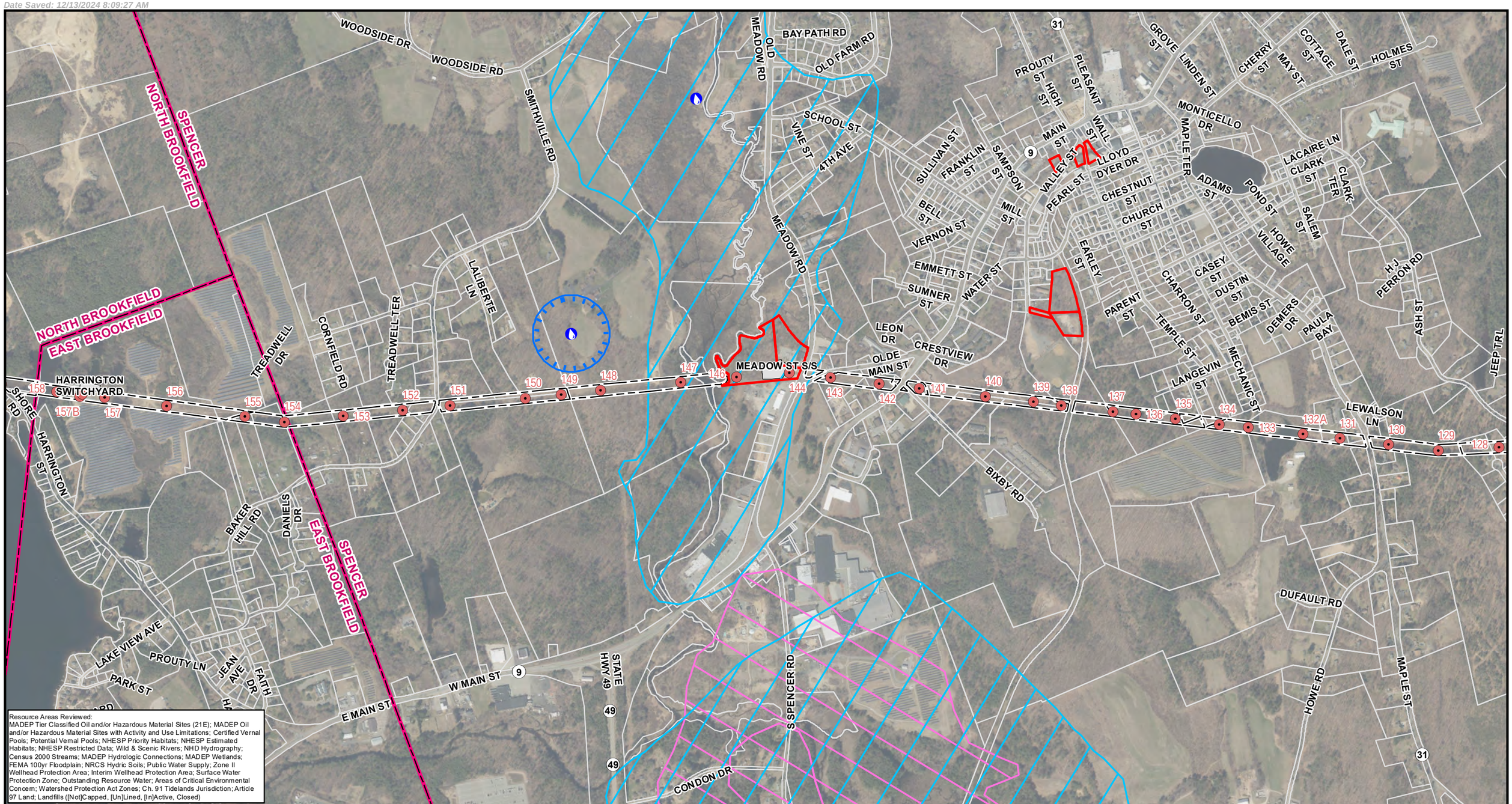

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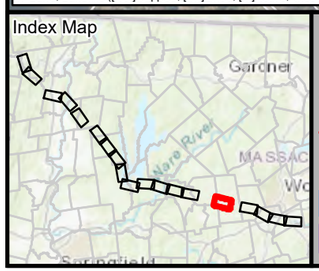

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

East Brookfield & Spencer, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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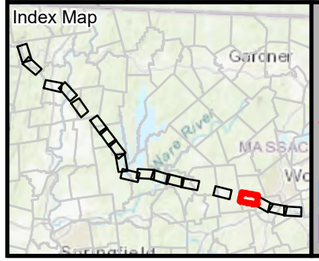

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Leicester MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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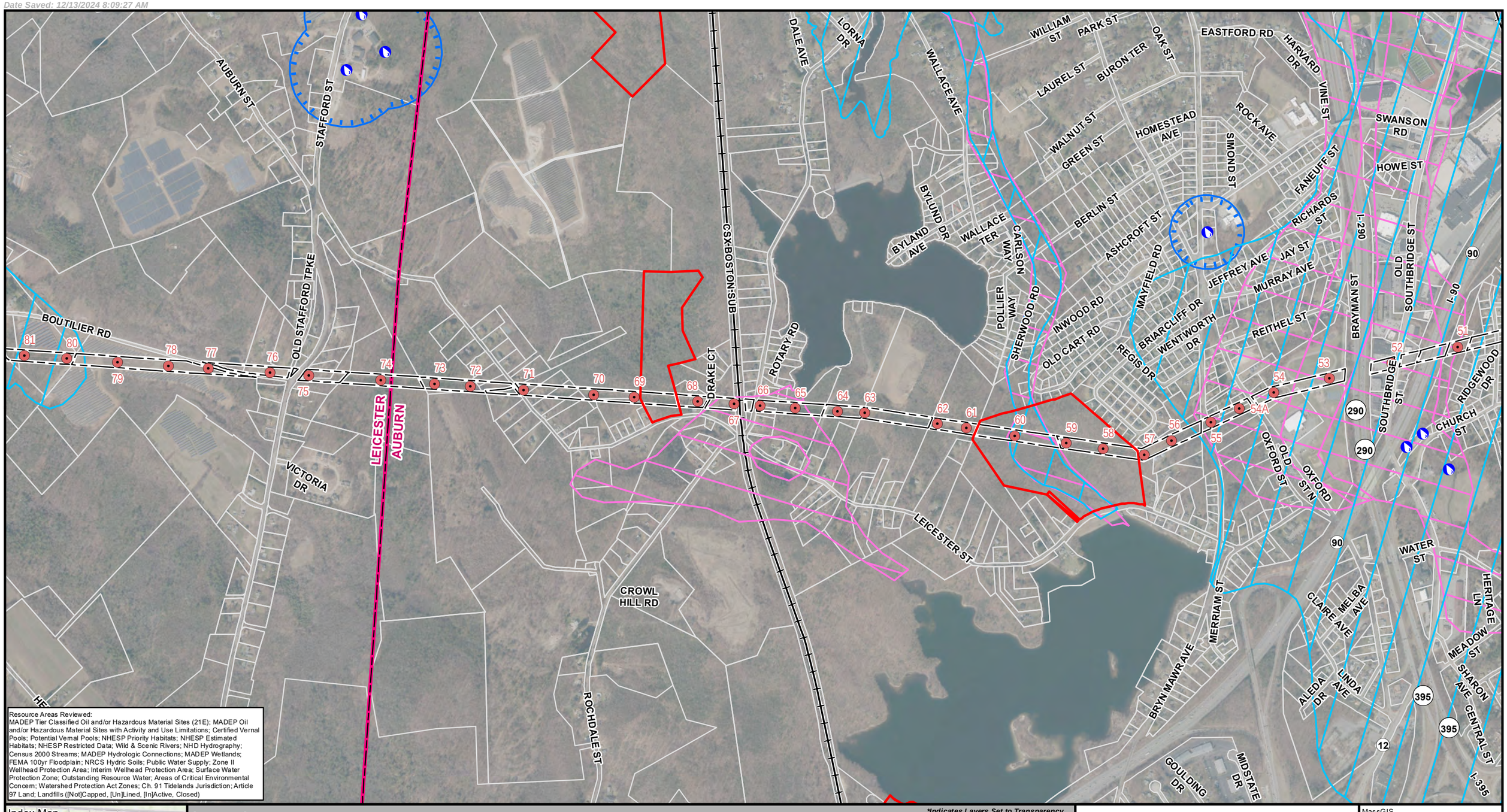

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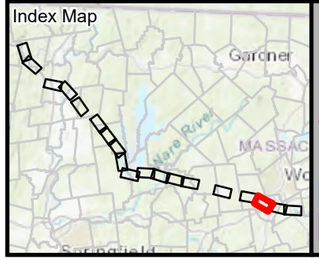

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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Leicester & Auburn, MA

MassGIS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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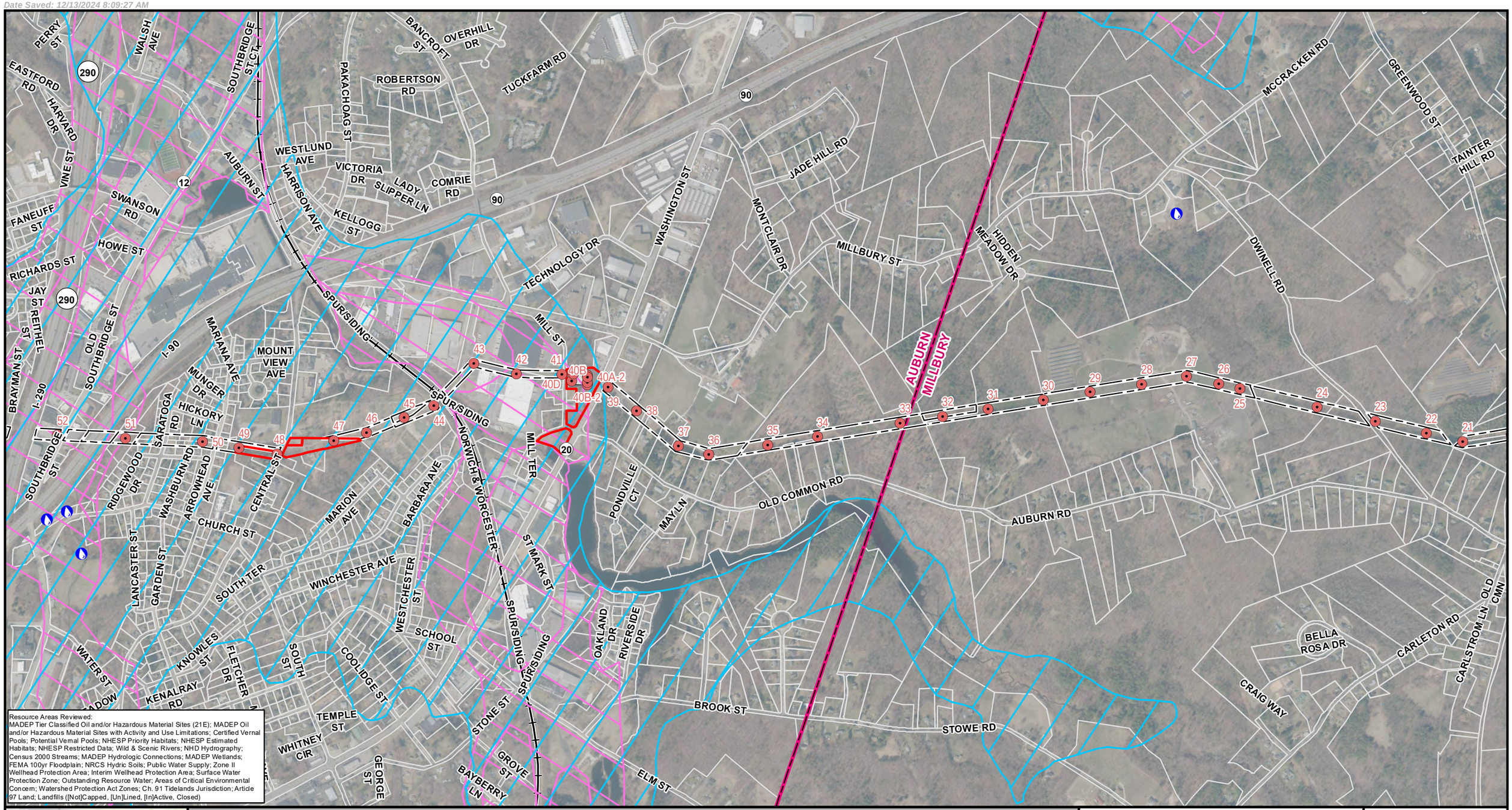

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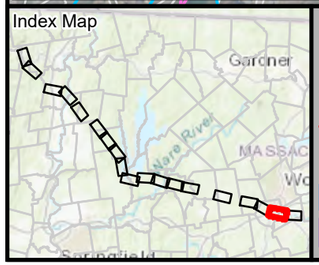

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Auburn & Millbury, MA

MassGIS
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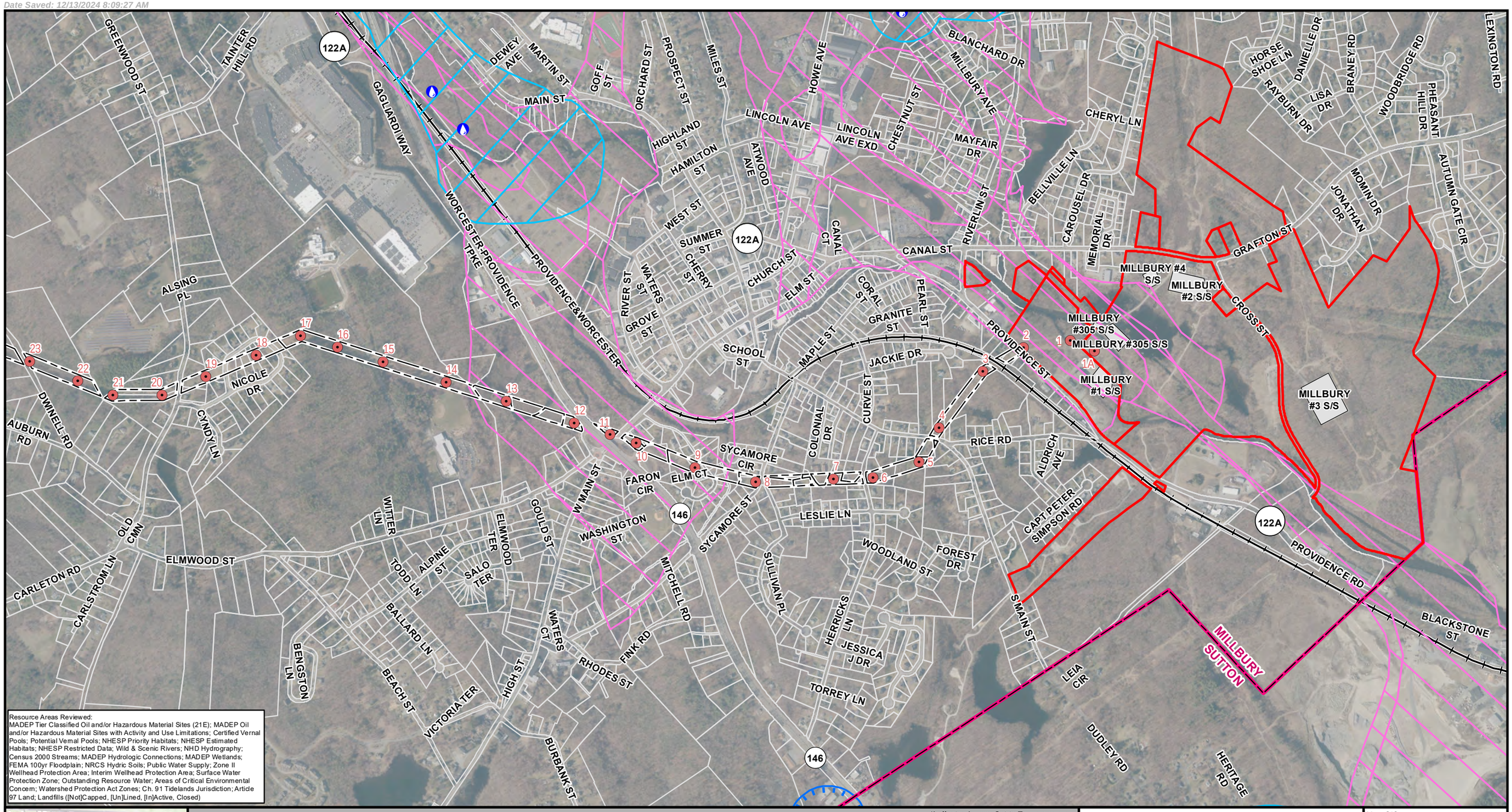

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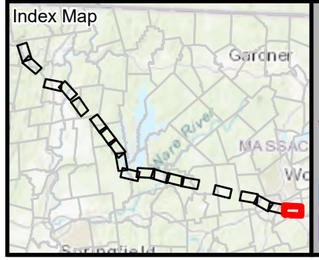

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT

Water Supply Protection Areas

Millbury, MA

MassGIS
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Appendix A – Figures and Plans
Figure 4 – Cross Section

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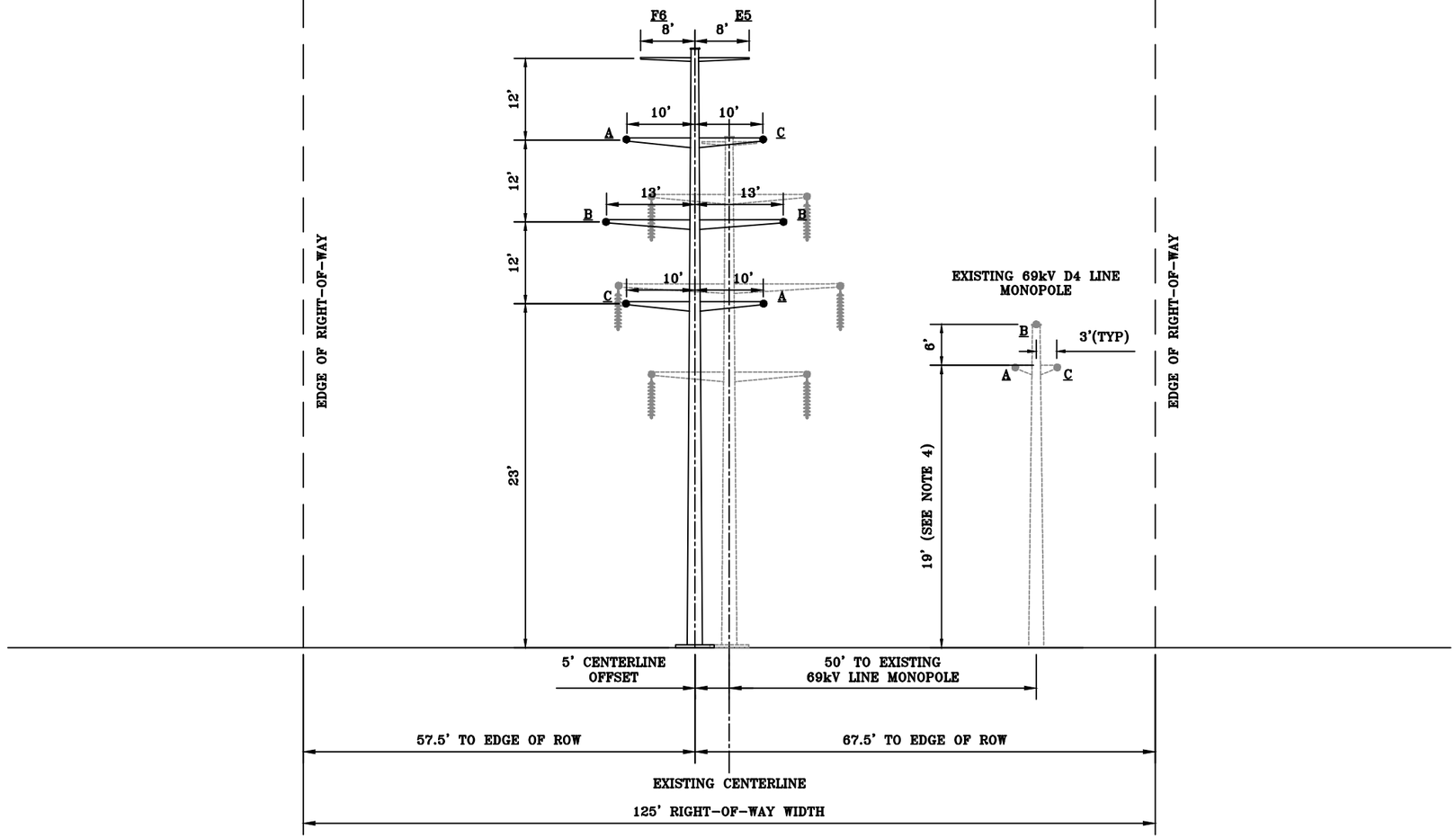
B-13148-NE

PROPOSED 115kV MONOPOLE
EXISTING 69kV TO BE REMOVED
(SEE NOTE 1)



CROSS SECTION 1
LOOKING AHEAD ON LINE TOWARDS DEERFIELD #4 SUB
SEE EMF OVERVIEW MAP FOR STRUCTURE LOCATIONS

NOTES:
1. PROPOSED E5/F6 LINES SHALL BE OPERATED AT 69kV BUT DESIGNED TO ACCOMMODATE 115kV. EMF ANALYSIS REQUIRED AT BOTH 69kV AND 115kV VOLTAGES.
2. SEE TABLES IN APPENDIX FOR EXISTING STRUCTURE GEOMETRY.
3. PHASE SPACING FROM CIRCUIT TO CIRCUIT MAY SLIGHTLY VARY FROM DIMENSIONS SHOWN DEPENDING ON PROPOSED POLE DIAMETERS, WHICH HAVE NOT YET BEEN DETERMINED.
4. THE WIRE SAG UNDER MAXIMUM OPERATING CONDITIONS FOR THE D4 LINE IS UNKNOWN, BUT IS ASSUMED AS CURRENT NESC CODE MINIMUM GROUND CLEARANCE FOR 69kV FOR LAND TRAVERSED BY VEHICLES.

NOT FOR CONSTRUCTION

nationalgrid

E5/F6 LINE REBUILD & UPGRADE
MILLBURY SUB TO DEERFIELD #4 SUB
69kV TRANSMISSION LINE
EMF CROSS SECTION DRAWINGS

SCALE: NTS REV: 1 SHEET 1 OF 8 DATE: 11/03/23

INCHES ON ORIGINAL

B-13148-NE

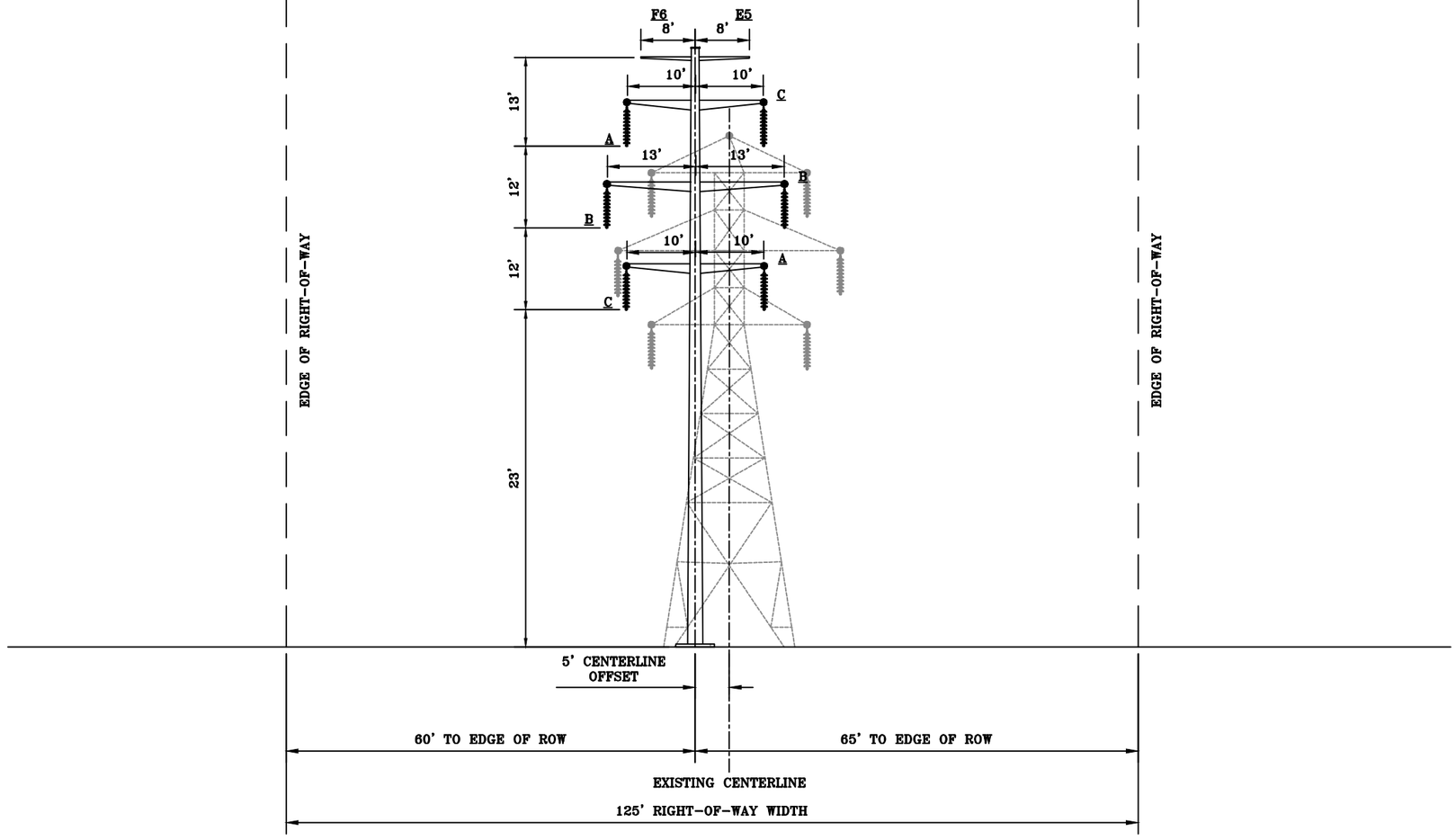
REVISIONS						
REV.	DATE	DESCRIPTION	MADE	CHECKED	INSPECTED	APPROVED	APPROVED
1	11/03/23	ISSUED WITH EMF BID PACKAGE	AM	AW		LMD	
2							
3							
4							
5							
6							

ORIGINAL	
DATE	11/03/23
DESIGNED	AM
CHECKED	AW
DRAWN	EAF
CHECKED	
REVIEWED	
APPROVED	LMD

INCHES

B-13148-NE

PROPOSED 115kV MONOPOLE
EXISTING 69kV TO BE REMOVED
(SEE NOTE 1)



CROSS SECTION 2

LOOKING AHEAD ON LINE TOWARDS DEERFIELD #4 SUB

SEE EMF OVERVIEW 1 FOR STRUCTURE LOCATIONS

NOTES:
1. PROPOSED E5/F6 LINES SHALL BE OPERATED AT 69kV BUT DESIGNED TO ACCOMMODATE 115kV. EMF ANALYSIS REQUIRED AT BOTH 69kV AND 115kV VOLTAGES.
2. SEE TABLES IN APPENDIX FOR EXISTING STRUCTURE GEOMETRY.
3. PHASE SPACING FROM CIRCUIT TO CIRCUIT MAY SLIGHTLY VARY FROM DIMENSIONS SHOWN DEPENDING ON PROPOSED POLE DIAMETERS, WHICH HAVE NOT YET BEEN DETERMINED.
4. DEADEND STRUCTURE LOCATIONS WILL HAVE SLIGHT VARIATION IN ARM LENGTH DUE TO LINE ANGLE.
5. DISTRIBUTION LINES ARE LOCATED ADJACENT TO SOME SPANS ON THE MAIN LINE, BUT ARE NOT INFREQUENT AND INTERMITTENT AND ARE THEREFORE NOT DEPICTED IN THE CROSS SECTION.
6. DUE TO CONSTRUCTION CONSIDERATIONS AT ANGLES, STRUCTURE PLACEMENT IN RIGHT-OF-WAY VARIES IN THESE LOCATIONS. THE CROSS SECTION SHOWN REPRESENTS MOST LOCATION ASSOCIATED WITH THIS CROSS SECTION. HOWEVER, ANGLE STRUCTURES MAY SEE LEFT EDGE OF RIGHT-OF-WAY REDUCED TO UP TO APPROXIMATELY 30 FT.
7. EXISTING RIGHT-OF-WAY WIDTH IN MANY AREAS OF THE LINE IS UNKNOWN OR UNDEFINED. THESE AREAS ARE ASSUMED TO HAVE A 125 FT WIDTH, CENTERED ON THE EXISTING LINE, BASED ON FEEDBACK FROM REAL ESTATE.

NOT FOR CONSTRUCTION

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E5/F6 LINE REBUILD & UPGRADE
MILLBURY SUB TO DEERFIELD #4 SUB
69kV TRANSMISSION LINE
EMF CROSS SECTION DRAWINGS

SCALE: NTS REV: 1 SHEET 2 OF 8 DATE: 11/03/23

B-13148-NE

INCHES ON ORIGINAL

REVISIONS

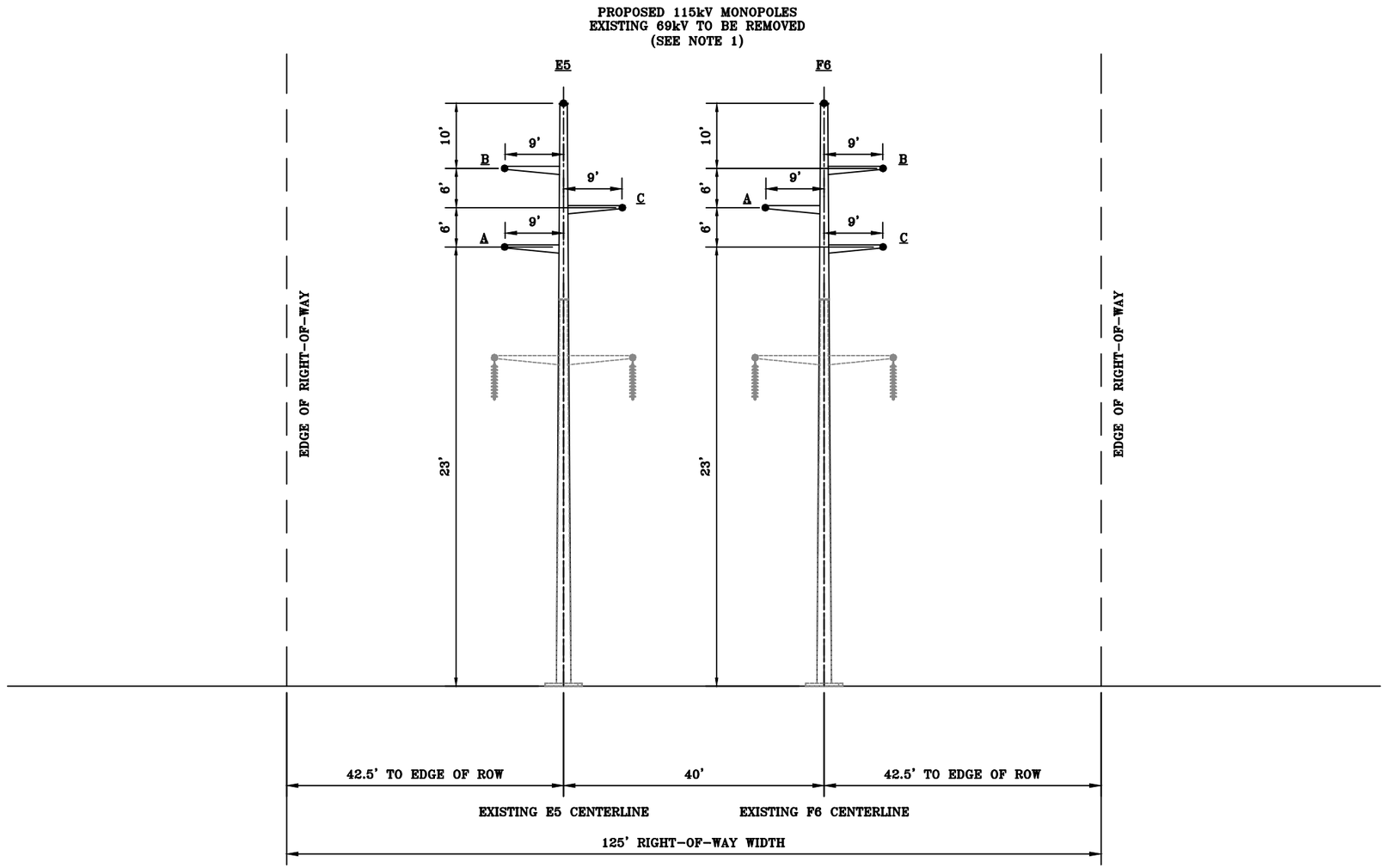
REV.	DATE	DESCRIPTION	MADE	CHECKED	INSPECTED	APPROVED	APPROVED
1	11/03/23	ISSUED WITH EMF BID PACKAGE	AM	AW		LMD	
2							
3							
4							
5							
6							

ORIGINAL

DATE 11/03/23	
DESIGNED	AM
CHECKED	AW
DRAWN	EAF
CHECKED	
REVIEWED	
APPROVED	LMD

INCHES ON ORIGINAL

B-13148-NE



CROSS SECTION 3

LOOKING AHEAD ON LINE TOWARDS DEERFIELD #3 SUB

SEE EMF OVERVIEW MAP FOR STRUCTURE LOCATIONS

NOTES:
1. PROPOSED E5/F6 LINES SHALL BE OPERATED AT 69 kV BUT DESIGNED TO ACCOMMODATE 115kV. EMF ANALYSIS REQUIRED AT BOTH 69kV AND 115kV VOLTAGES.
2. SEE TABLES IN APPENDIX FOR EXISTING STRUCTURE GEOMETRY.
3. PHASE SPACING FROM CIRCUIT TO CIRCUIT MAY SLIGHTLY VARY FROM DIMENSIONS SHOWN DEPENDING ON PROPOSED POLE DIAMETERS, WHICH HAVE NOT YET BEEN DETERMINED.

NOT FOR CONSTRUCTION

nationalgrid

E5/F6 LINE REBUILD & UPGRADE
MILLBURY SUB TO DEERFIELD #4 SUB
69kV TRANSMISSION LINE
EMF CROSS SECTION DRAWINGS

SCALE: NTS REV: 1 SHEET 3 OF 8 DATE: 11/03/23

INCHES ON ORIGINAL

B-13148-NE

REVISIONS							
REV.	DATE	DESCRIPTION	MADE	CHECKED	INSPECTED	APPROVED	APPROVED
1	11/03/23	ISSUED WITH EMF BID PACKAGE	AM	AW		LMD	
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4							
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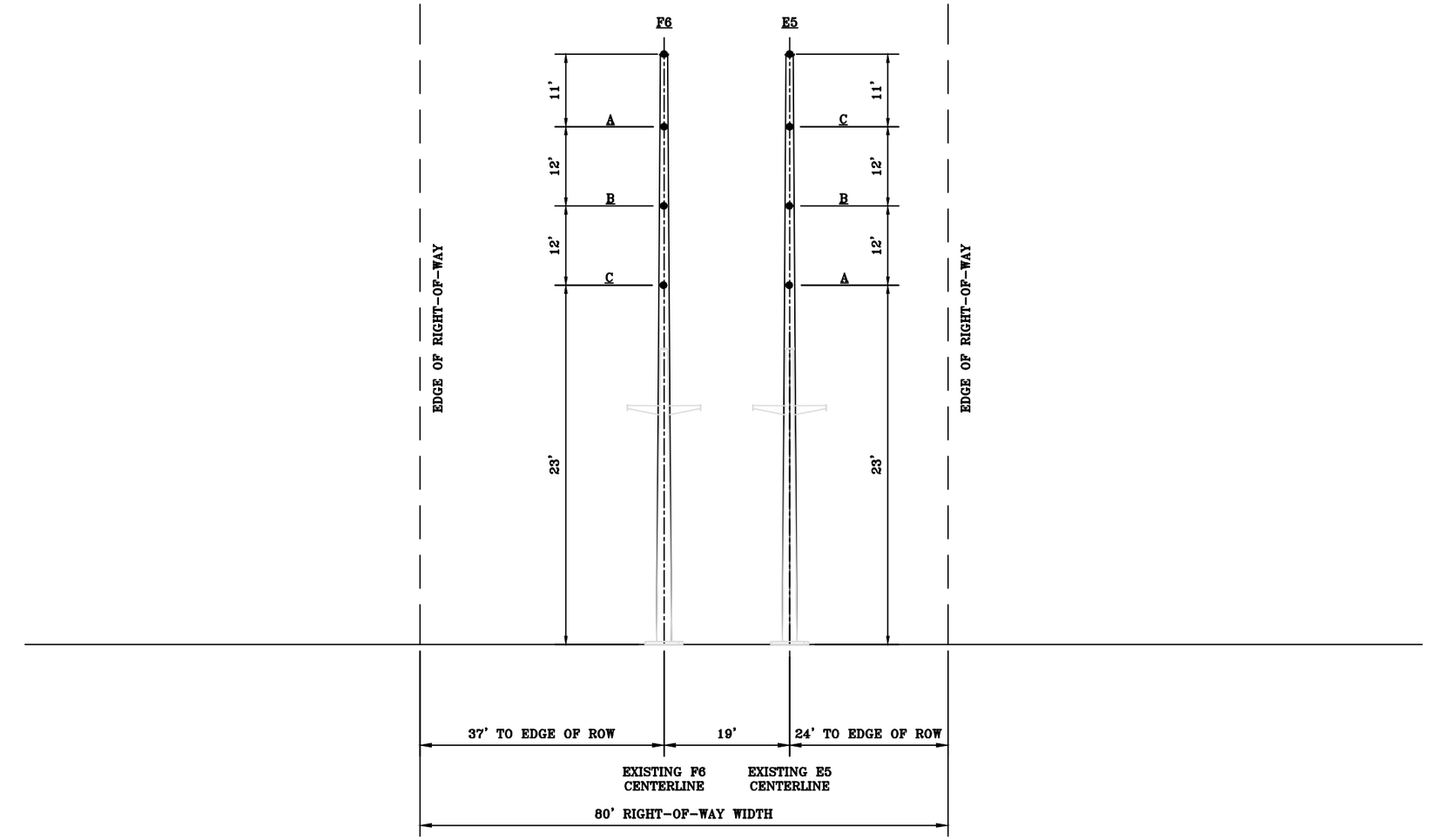
ORIGINAL		
DATE	11/03/23	
DESIGNED	AM	
CHECKED	AW	
DRAWN	EAF	
CHECKED		
REVIEWED		
APPROVED	LMD	

INCHES ON ORIGINAL

B-13148-NE

PROPOSED 115kV MONOPOLES
EXISTING 69kV TO BE REMOVED
(SEE NOTE 1)



CROSS SECTION 4
LOOKING AHEAD ON LINE TOWARDS QUABBIN SUB
SEE EMF OVERVIEW MAP FOR STRUCTURE LOCATIONS

NOTES:
1. PROPOSED E5/F6 LINES SHALL BE OPERATED AT 69kV BUT DESIGNED TO ACCOMMODATE 115kV. EMF ANALYSIS REQUIRED AT BOTH 69kV AND 115kV VOLTAGES.
2. SEE TABLES IN APPENDIX FOR EXISTING STRUCTURE GEOMETRY.
3. PHASE SPACING FROM CIRCUIT TO CIRCUIT MAY SLIGHTLY VARY FROM DIMENSIONS SHOWN DEPENDING ON PROPOSED POLE DIAMETERS, WHICH HAVE NOT YET BEEN DETERMINED.

NOT FOR CONSTRUCTION

nationalgrid

E5/F6 LINE REBUILD & UPGRADE
MILLBURY SUB TO DEERFIELD #4 SUB
69kV TRANSMISSION LINE
EMF CROSS SECTION DRAWINGS

SCALE: NTS REV: 1 SHEET 4 OF 8 DATE: 11/03/23

INCHES ON ORIGINAL

B-13148-NE

REVISIONS

REV.	DATE	DESCRIPTION	MADE	CHECKED	INSPECTED	APPROVED	APPROVED
1	11/03/23	ISSUED WITH EMF BID PACKAGE	AM	AW		LMD	
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ORIGINAL

DATE	11/03/23	
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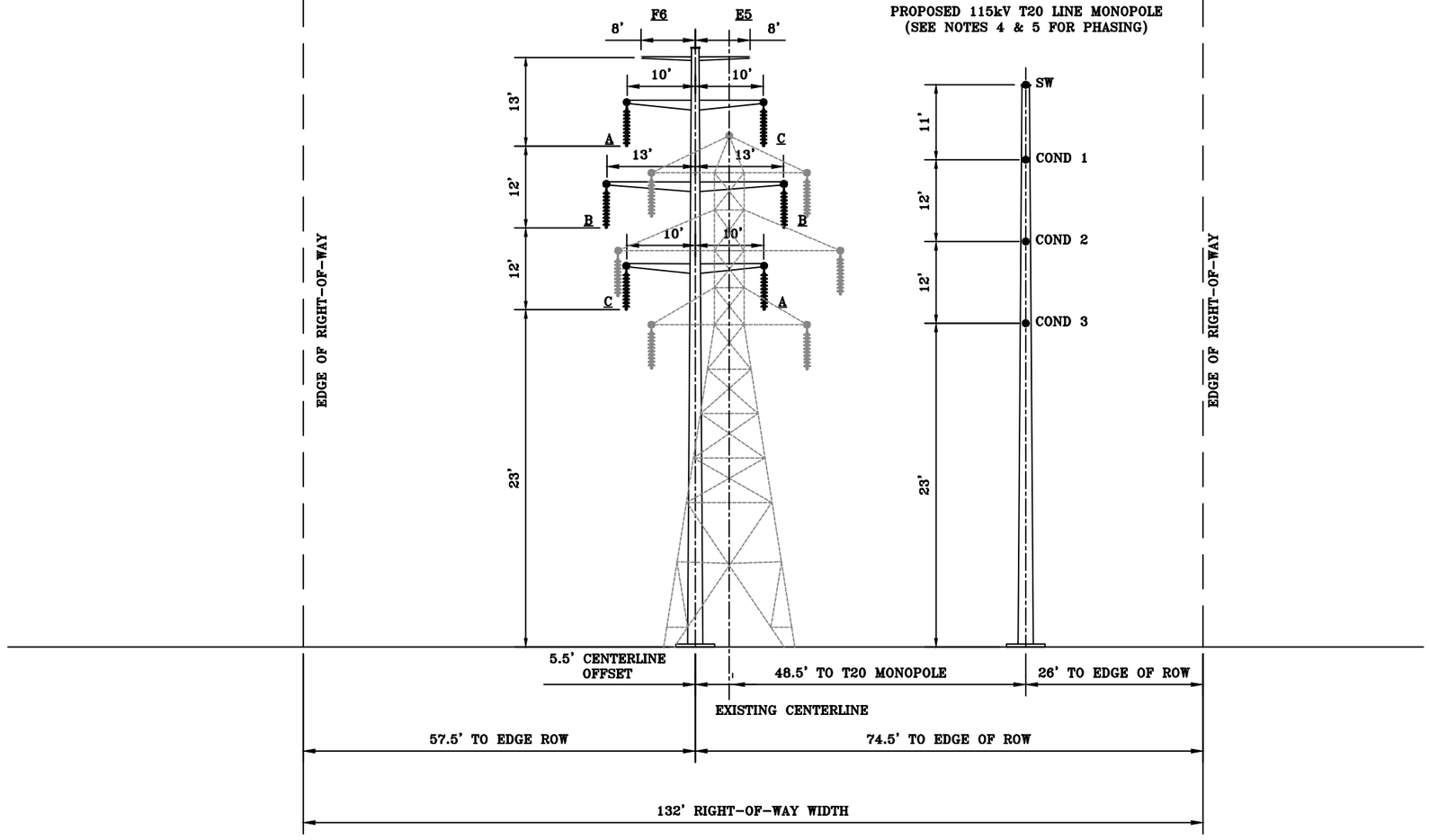
CHECKED	AW	
DRAWN	EAF	
CHECKED		
REVIEWED		
APPROVED	LMD	

INCHES ON ORIGINAL

B-13148-NE

PROPOSED 115kV MONOPOLE
EXISTING 69kV TO BE REMOVED
(SEE NOTE 1)

PROPOSED 115kV T20 LINE MONOPOLE
(SEE NOTES 4 & 5 FOR PHASING)



CROSS SECTION 5
LOOKING AHEAD ON LINE TOWARDS HARRINGTON SWITCHYARD
SEE EMF OVERVIEW MAP FOR STRUCTURE LOCATIONS

NOTES:
1. PROPOSED E5/F6 LINES SHALL BE OPERATED AT 69kV BUT DESIGNED TO ACCOMMODATE 115kV. EMF ANALYSIS REQUIRED AT BOTH 69kV AND 115kV VOLTAGES.
2. SEE TABLES IN APPENDIX FOR EXISTING STRUCTURE GEOMETRY.
3. PHASE SPACING FROM CIRCUIT TO CIRCUIT MAY SLIGHTLY VARY FROM DIMENSIONS SHOWN DEPENDING ON PROPOSED POLE DIAMETERS, WHICH HAVE NOT YET BEEN DETERMINED.
4. THE T20 LINE WILL OPERATE AT 69kV BUT DESIGNED TO ACCOMMODATE 115kV. EMF ANALYSIS SHOULD ASSUME 115kV OPERATION. PHASING OF THIS LINE IS UNKNOWN. FOR THE PURPOSE OF THE ANALYSIS, THE PHASING CONFIGURATION WHICH GENERATES THE LARGEST EMF SHALL BE CONSIDERED,
5. T20 STRUCTURE FRAMING AND CENTERLINE DETAILS ARE PRELIMINARY.

NOT FOR CONSTRUCTION

nationalgrid

E5/F6 LINE REBUILD & UPGRADE
MILLBURY SUB TO DEERFIELD #4 SUB
69kV TRANSMISSION LINE
EMF CROSS SECTION DRAWINGS

SCALE: NTS REV: 1 SHEET 5 OF 8 DATE: 11/03/23

B-13148-NE

INCHES ON ORIGINAL

REVISIONS						
REV.	DATE	DESCRIPTION	MADE	CHECKED	INSPECTED	APPROVED	APPROVED
1	11/03/23	ISSUED WITH EMF BID PACKAGE	AM	AW		LMD	
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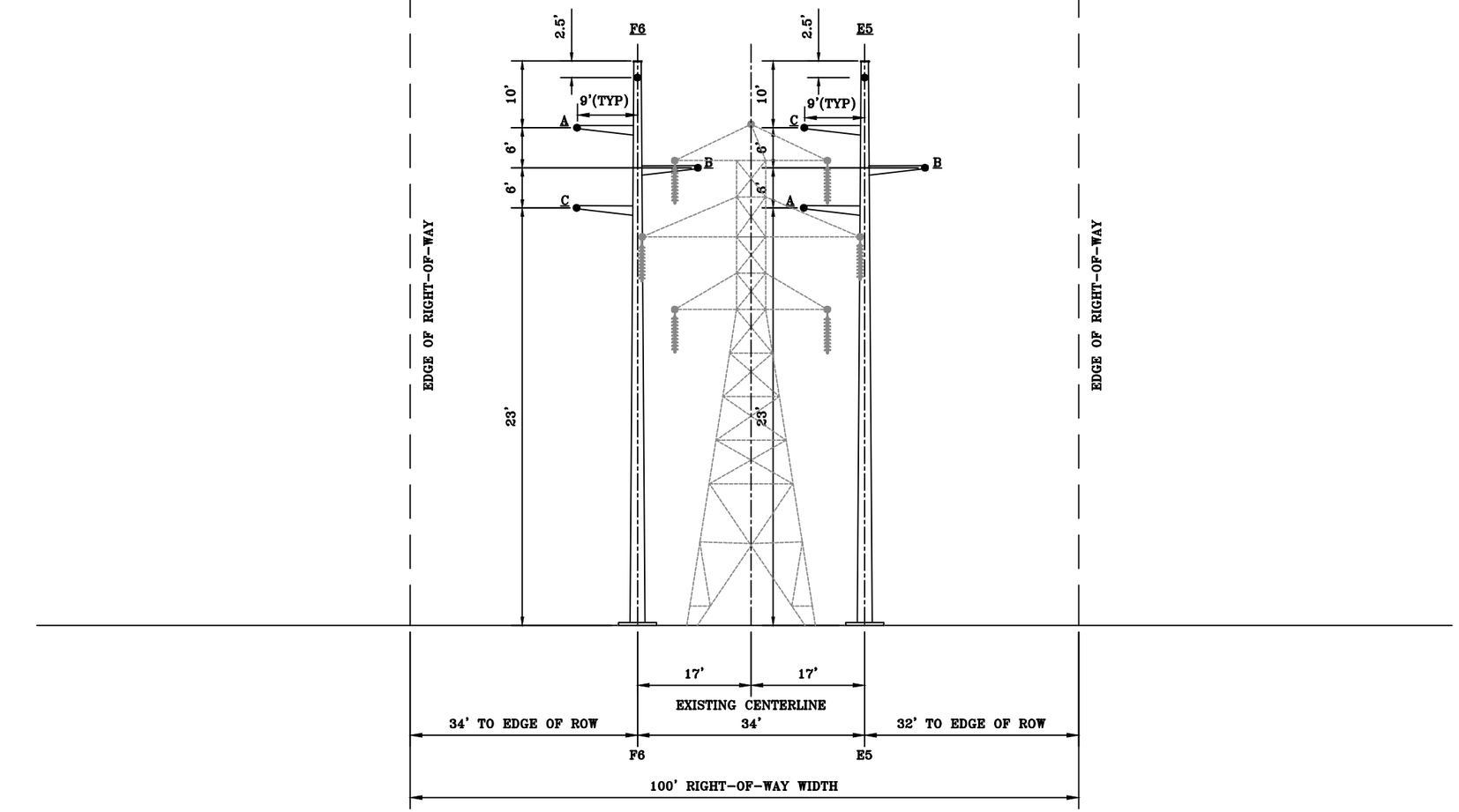
ORIGINAL

DATE 11/03/23	
DESIGNED	AM
CHECKED	AW
DRAWN	EAF
CHECKED	
REVIEWED	
APPROVED	LMD

INCHES ON ORIGINAL

B-13148-NE

PROPOSED 115kV MONOPOLES
EXISTING 69kV TO BE REMOVED
(SEE NOTE 1)



CROSS SECTION 6
LOOKING AHEAD ON LINE TOWARDS DEERFIELD #4 SUB
SEE EMF OVERVIEW MAP FOR STRUCTURE LOCATIONS

NOTES:
1. PROPOSED E5/F6 LINES SHALL BE OPERATED AT 69kV BUT DESIGNED TO ACCOMMODATE 115kV. EMF ANALYSIS REQUIRED AT BOTH 69kV AND 115kV VOLTAGES.
2. SEE TABLES IN APPENDIX FOR EXISTING STRUCTURE GEOMETRY.
3. PHASE SPACING FROM CIRCUIT TO CIRCUIT MAY SLIGHTLY VARY FROM DIMENSIONS SHOWN DEPENDING ON PROPOSED POLE DIAMETERS, WHICH HAVE NOT YET BEEN DETERMINED.

NOT FOR CONSTRUCTION

nationalgrid

E5/F6 LINE REBUILD & UPGRADE
MILLBURY SUB TO DEERFIELD #4 SUB
69kV TRANSMISSION LINE
EMF CROSS SECTION DRAWINGS

SCALE: NTS REV: 1 SHEET 6 OF 8 DATE: 11/03/23

INCHES ON ORIGINAL

B-13148-NE

REVISIONS

REV.	DATE	DESCRIPTION	MADE	CHECKED	INSPECTED	APPROVED	APPROVED
1	11/03/23	ISSUED WITH EMF BID PACKAGE	AM	AW		LMD	
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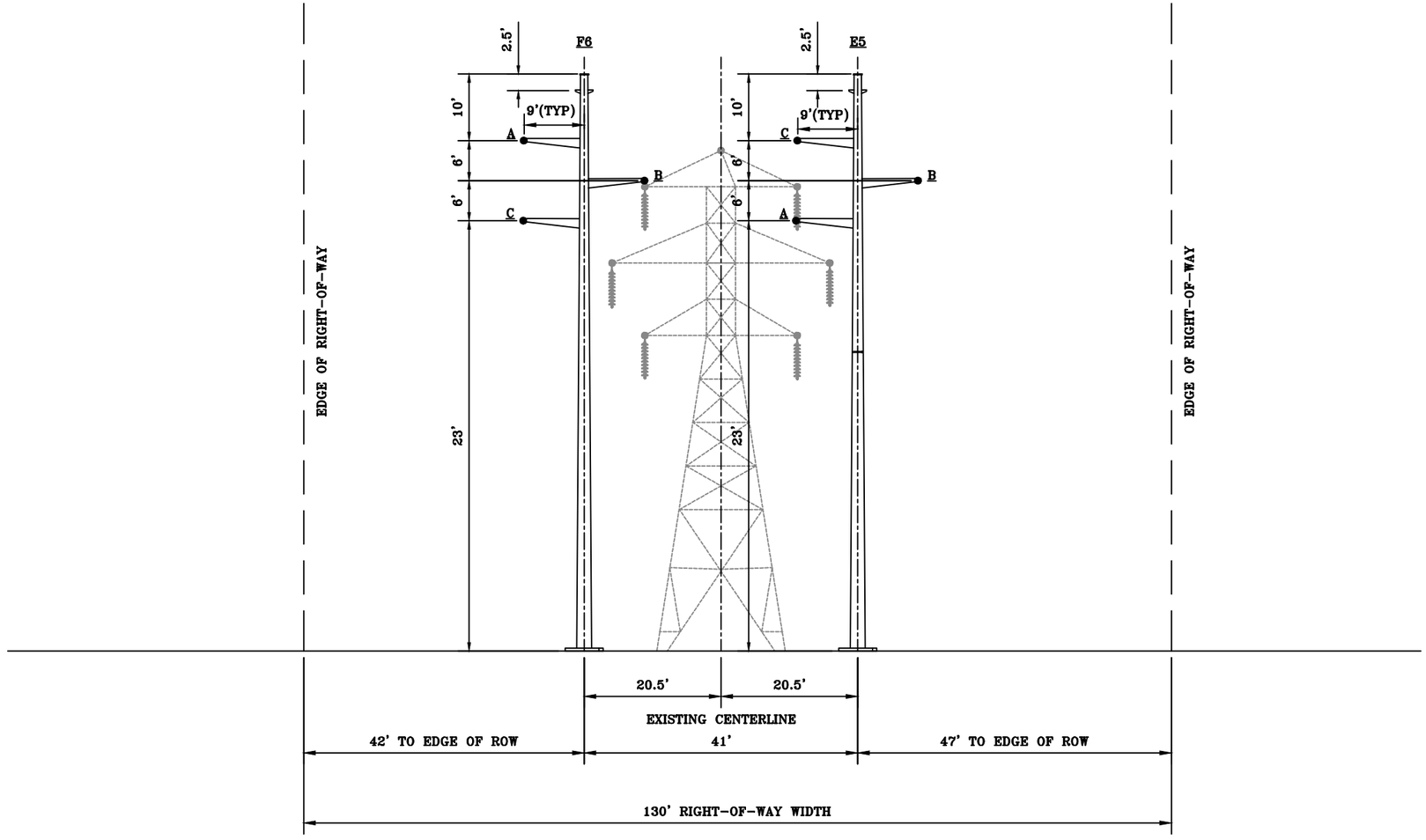
ORIGINAL

DATE	11/03/23
DESIGNED	AM
CHECKED	AW
DRAWN	EAF
CHECKED	
REVIEWED	
APPROVED	LMD

INCHES ON ORIGINAL

B-13148-NE

PROPOSED 115kV MONOPOLES
EXISTING 69kV TO BE REMOVED
(SEE NOTE 1)



CROSS SECTION 7
LOOKING AHEAD ON LINE TOWARDS DEERFIELD #4 SUB
SEE EMF OVERVIEW MAP FOR STRUCTURE LOCATIONS

NOTES:
1. PROPOSED E5/F6 LINES SHALL BE OPERATED AT 69kV BUT DESIGNED TO ACCOMMODATE 115kV. EMF ANALYSIS REQUIRED AT BOTH 69kV AND 115kV VOLTAGES.
2. SEE TABLES IN APPENDIX FOR EXISTING STRUCTURE GEOMETRY.
3. PHASE SPACING FROM CIRCUIT TO CIRCUIT MAY SLIGHTLY VARY FROM DIMENSIONS SHOWN DEPENDING ON PROPOSED POLE DIAMETERS, WHICH HAVE NOT YET BEEN DETERMINED.

NOT FOR CONSTRUCTION

nationalgrid

E5/F6 LINE REBUILD & UPGRADE
MILLBURY SUB TO DEERFIELD #4 SUB
69kV TRANSMISSION LINE
EMF CROSS SECTION DRAWINGS

SCALE: NTS REV: 1 SHEET 7 OF 8 DATE: 11/03/23

INCHES ON ORIGINAL

B-13148-NE

REVISIONS

REV.	DATE	DESCRIPTION	MADE	CHECKED	INSPECTED	APPROVED	APPROVED
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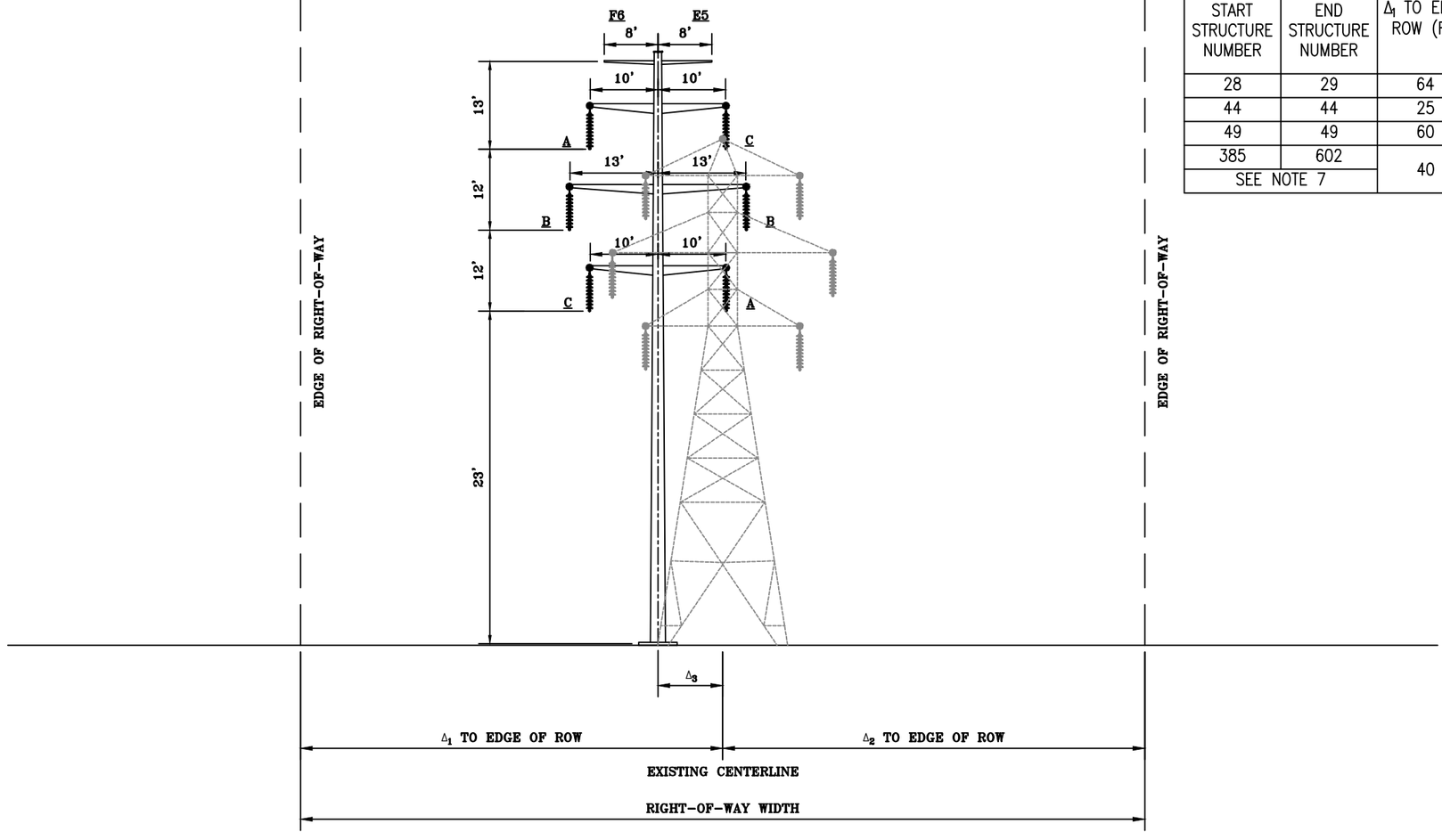
ORIGINAL

DATE	11/03/23	
DESIGNED	AM	1
CHECKED	AW	2
DRAWN	EAF	3
CHECKED		4
REVIEWED		5
APPROVED	LMD	6

B-13148-NE

PROPOSED 115kV MONOPOLE
EXISTING 69kV TO BE REMOVED
(SEE NOTE 1)



PROPOSED START STRUCTURE NUMBER	PROPOSED END STRUCTURE NUMBER	Δ_1 TO EDGE ROW (FT)	Δ_2 TO EDGE ROW (FT)	ROW WIDTH (FT)	PROPOSED STRUCTURE CENTERLINE OFFSET (Δ_3) (FT)
28	29	64	41	105	4.5
44	44	25	55	80	2
49	49	60	40	100	5
385	602	40	60	100	10
SEE NOTE 7					

CROSS SECTION 8
LOOKING AHEAD ON LINE TOWARDS DEERFIELD #4 SUB
SEE EMF OVERVIEW MAP FOR STRUCTURE LOCATIONS

NOTES:
1. PROPOSED E5/F6 LINES SHALL BE OPERATED AT 69kV BUT DESIGNED TO ACCOMMODATE 115kV. EMF ANALYSIS REQUIRED AT BOTH 69kV AND 115kV VOLTAGES.
2. SEE TABLES IN APPENDIX FOR EXISTING STRUCTURE GEOMETRY.
3. PHASE SPACING FROM CIRCUIT TO CIRCUIT MAY SLIGHTLY VARY FROM DIMENSIONS SHOWN DEPENDING ON PROPOSED POLE DIAMETERS, WHICH HAVE NOT YET BEEN DETERMINED.
4. DEADEND STRUCTURE LOCATIONS WILL HAVE SLIGHT VARIATION IN ARM LENGTH DUE TO LINE ANGLE.
5. DISTRIBUTION LINES ADJACENT TO SOME SPANS ON THE MAIN LINE, BUT ARE INFREQUENT AND INTERMITTENT AND ARE THEREFORE NOT DEPICTED IN THE CROSS SECTION.
6. LOCATIONS IN TABLE ABOVE ONLY CONSIDER UNIQUE RIGHT-OF-WAY AREAS WHERE WIDTH IS LESS THAN 125 FT. WIDER EASEMENTS ARE NOT LISTED AS THE EMF AT EDGE OF RIGHT-OF-WAY WOULD BE REDUCED COMPARED TO THE SCENARIO SHOWN IN SHEET 2. REDUCED EASEMENT WIDTH SOUTHEAST OF PONDVILLE SUSTATION NOT INCLUDED DUE TO EASEMENT ACQISITION BEING UNDERWAY.
7. 100 FT ROW OCCURS INTERMITTENTLY FROM STR.385 TO STR.602.

NOT FOR CONSTRUCTION

nationalgrid

E5/F6 LINE REBUILD & UPGRADE
MILLBURY SUB TO DEERFIELD #4 SUB
69kV TRANSMISSION LINE
EMF CROSS SECTION DRAWINGS

SCALE: NTS REV: 1 SHEET 8 OF 8 DATE: 11/03/23

B-13148-NE

INCHES ON ORIGINAL

REVISIONS						
REV.	DATE	DESCRIPTION	MADE	CHECKED	INSPECTED	APPROVED	APPROVED
1	11/03/23	ISSUED WITH EMF BID PACKAGE	AM	AW			LMD
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DATE	11/03/23	
DESIGNED	AM	
CHECKED	AW	
DRAWN	EAF	
CHECKED		
REVIEWED		
APPROVED	LMD	

Appendix B – ENF Distribution List

Environmental Notification Form (ENF)

Central To Western Massachusetts Energy Improvement Project

Distribution List

Massachusetts Environmental Policy Act (MEPA) Distribution List

Agency	Email Address	Address
Massachusetts Environmental Policy Act (MEPA) Office	MEPA@mass.gov	**MEPA Office** 100 Cambridge Street, Suite 900 Boston, MA 02114
Department of Environmental Protection, Boston Office	helena.boccadoro@mass.gov	**Commissioner's Office** One Winter Street Boston, MA 02108
Department of Environmental Protection, Appropriate Regional Office and to each program from which a permit will be sought	Catherine.Skiba@mass.gov Sean.Gonsalves@mass.gov	**DEP/Western Regional Office** Attn: MEPA Coordinator State House West - 4th floor 436 Dwight Street Springfield, MA 01103
	andrea.briggs@mass.gov	**DEP/Central Regional Office** Attn: MEPA Coordinator 8 New Bond Street Worcester, MA 01606
Massachusetts Department of Transportation - Boston	MassDOTPPDU@dot.state.ma.us	**Public/Private Development Unit** 10 Park Plaza, Suite #4150 Boston, MA 02116
Massachusetts Department of Transportation – District Office	patrick.tierney@dot.state.ma.us	**District #1** Attn: MEPA Coordinator 270 Main Street Lenox, MA 01240
	bao.lang@dot.state.ma.us garrett.postema@dot.state.ma.us	**District #2** Attn: MEPA Coordinator 811 North King Street Northampton, MA 01060
	Kevin.R.Robenhymer@dot.state.ma.us Eric.Nascimento@dot.state.ma.us	**District #3** Attn: MEPA Coordinator 499 Plantation Parkway Worcester, MA 01605
Massachusetts Historical Commission	Mail one hard copy of the filing to MHC	**The MA Archives Building** 220 Morrissey Boulevard Boston, MA 02125
Applicable Regional Planning Agency	mepafiling@cmrpc.org	**Central Massachusetts Regional Planning Commission (CMRPC)**
	KMacPhee@frcog.org PSloan@frcog.org Mail two hard copies to FRCoG	**Franklin Regional Council of Governments (FRCoG)** Attn: Kimberly MacPhee and Peggy Sloan 12 Olive Street Greenfield, MA 01301

If the Project is located within five miles of an Environmental Justice Population	MEPA-EJ@mass.gov	**MEPA Office** Attn: EEA Environmental Justice Director 100 Cambridge Street, Suite 900 Boston, MA 02144
If the Project site is within or contains designated significant or estimated habitat, or priority sites of endangered or threatened species or species of special concern in accordance with the Massachusetts Endangered Species Act	melany.cheeseman@mass.gov emily.holt@mass.gov	**Natural Heritage and Endangered Species Program** Division of Fisheries & Wildlife 1 Rabbit Hill Road Westborough, MA 01581
If the Project affects DCR roadways, watersheds or other properties or an ACEC	andy.backman@mass.gov	**DCR** Attn: MEPA Coordinator 251 Causeway Street, Suite 600 Boston, MA 02114
If the Project implicates public health impacts	dphtoxicology@massmail.state.ma.us	**Department of Public Health** Director of Environmental Health 250 Washington Street Boston, MA 02115
If the Project is subject to Greenhouse Gas Emissions Policy or to review by Energy Facilities Siting Board	andrew.greene@mass.gov geneen.bartley@mass.gov	**Energy Facilities Siting Board** Attn: MEPA Coordinator One South Station Boston, MA 02110
	paul.ormond@mass.gov	**Department of Energy Resources** Attn: MEPA Coordinator 100 Cambridge Street, 10th floor Boston, MA 02114

Municipality Contacts

Municipality	Email Address	Address
Millbury	Board of Selectmen afleming@millburyma.gov	127 Elm Street Millbury, MA 01527
	Board of Health millburyboh@millburyma.gov jschold@millburyma.gov	
	Planning Board cmccormack@millburyma.gov	
	Conservation Commission rfoley@millburyma.gov	
	Millbury Public Library adallair@millburyma.gov	128 Elm Street Millbury, MA 01527
Auburn[1]	Select Board srufli@town.auburn.ma.us	104 Central Street Auburn, MA 01501
	Board of Health *Email not Provided*	
	Conservation Commission *Email not Provided*	
	Planning Board *Email not Provided*	
	Auburn Public Library *Email not Provided*	369 Southbridge Street Auburn, MA 01501
Leicester	Board of Health daglef@leicesterma.org	7 Washburn Square Leicester, MA 01524
	Conservation Commission conservation@leicesterma.org	3 Washburn Square Leicester, MA 01524
	Land Use & Planning Board planning@leicesterma.org	
	Select Board Selectboard@leicesterma.org	
	Leicester Public Library library@leicesterma.org	1136 Main Street Leicester, MA 01524

[1] Online Contact Form: https://www.auburnma.gov/formcenter/Contact-Us-Forms-10/Contact-Us-Auburn-Public-Library-61

Spencer	Board of Health ldaoust@spencerma.gov	157 Main Street Spencer, MA 01562
	Board of Selectmen jhoward@spencerma.gov	
	Planning Board mgervais@spencerma.gov	
	Conservation Commission conservation@spencerma.gov	
	Richard Sugden Library cdonahue@cwmars.org	8 Pleasant Street Spencer, MA 01562
East Brookfield[2]	Board of Health ebboh0343@eastbrookfieldma.us	122 Connie Mack Drive East Brookfield, MA 01515
	Conservation Commission conservation@eastbrookfieldma.us	
	Board of Selectmen ebbos300@eastbrookfieldma.us	
	Planning Board *Not Available*	
	East Brookfield Public Library ebplibrary@gmail.com	
North Brookfield	Board of Health health@northbrookfield.net	215 North Main Street North Brookfield, MA 01535
	Conservation Commission concomm01535@gmail.com	
	Board of Selectmen selectman@northbrookfield.net	
	Planning Board whking2005@gmail.com	
	Haston Free Public Library hastonfreepubliclibrary@gmail.com	161 N Main Street North Brookfield, MA 01535

[2] Online Form: https://www.eastbrookfieldma.us/home/webforms/contact-us

West Brookfield	Board of Health boh@wbrookfield.com	2 East Main Street West Brookfield, MA 01585
	Board of Selectmen bos@wbrookfield.com	
	Conservation Commission pskowyra@wbrookfield.com	
	Planning Board mczub@wbrookfield.com	
	Merriam-Gilbert Public Library merriamgilbert@gmail.com	3 W Main Street West Brookfield, MA 01585
Ware	Health Department acrete@townofware.com	Town Hall 126 Main Street Ware, MA 01082
	Selectboard sbeckley@townofware.com	
	Conservation Commission jprenosil@townofware.com	
	Planning & Community Development Department klucis@townofware.com	
	Young Men's Library Association hreed@cwmars.org	37 Main Street Ware, MA 01082
Belchertown	Health Department (see Town of Ware's Health Department contact)	Town Hall 2 Jabish Street Belchertown, MA 01007-0670
	Conservation Commission conservation@belchertown.org	
	Planning Board planning@belchertown.org	
	Select Board selectboard@belchertown.org	The Finnerty House One South Main Street Belchertown, MA 01007
	Clapp Memorial Library charbeson@cwmars.org	19 S Main Street Belchertown, MA 01007

Pelham	Health Department (see Town of Ware's Health Department contact)	Town Hall 126 Main Street Suite-D Ware, MA 01082
	Conservation Commission conservation@pelhamma.gov	351 Amherst Road Pelham, MA 01002
	Planning Board planning@pelhamma.gov	
	Select Board executiveassistant@pelhamma.gov	
	Pelham Free Public Library library.pelham@gmail.com	2 S Valley Rd, Pelham, MA 01002
Shutesbury	Board of Health boardhealth@shutesbury.org	1 Cooleyville Road, Shutesbury, MA 01072
	Planning Board planning@shutesbury.org	
	Select Board selectboard@shutesbury.org	
	Conservation Commission concom@shutesbury.org	
	M N Spear Memorial Library library.director@shutesbury.org	10 Cooleyville Rd, Shutesbury, MA 01072
Leverett	Board of Health boardofhealth@leverett.ma.us	9 Montague Road Leverett, MA 01054
	Select Board selectboard@leverett.ma.us	
	Planning Board planningbd@leverett.ma.us	
	Conservation Commission concom@leverett.ma.us	
	Leverett Library leverettlibrary@gmail.com	75 Montague Road Leverett, MA 01054

Sunderland[3]	Board of Health *Not Available*	12 School Street Sunderland, MA 01375
	Conservation Commission conservation@townofsunderland.us	
	Planning Board droscoe@pvpc.org	
	Selectboard *Not Available*	
	Sunderland Public Library director@sunderlandpubliclibrary.org	20 School Street Sunderland, MA 01375
Deerfield	Board of Health assistanthealthagent@town.deerfield.ma.us	8 Conway Street Deerfield Municipal Offices South Deerfield, MA 01373
	Conservation Commission bldgasst@town.deerfield.ma.us	
	Planning Board (see Town of Deerfield's Conservation Commission contact)	
	Selectboard thilchey@town.deerfield.ma.us	
	Tilton Library tiltonlibrary@cwmars.org	75 N Main Street South Deerfield, MA 01373
Conway	Board of Health boardofhealth@conwayma.gov	32 Main Street PO Box 240 Conway, MA 01341
	Conservation Commission concomm@conwayma.gov	
	Planning Board planningboard@conwayma.gov	
	Select Board cwaldo@conwayma.gov	Town Hall 5 Academy Hill Road Conway, MA 01341
	Field Memorial Library director@fieldmemoriallibrary.org	1 Elm Street Conway, MA 01341

[3] Online Form: https://www.townofsunderland.us/user/38/contact

Shelburne	Board of Health Boardofhealth@townofshelburnema.gov	51 Bridge Street Shelburne, MA 01370
	Conservation Commission conservation@townofshelburnema.gov	
	Planning Board Planningboard@townofshelburnema.gov	
	Selectboard townadmin@townofshelburnema.gov	51 Bridge Street, Shelburne, MA 01370
	Shelburne Free Public Library eantaya@cwmars.org	233 Shelburne Center Road, Shelburne Falls, MA 01370
	Arms Library armslibrary@gmail.com	60 Bridge Street, Shelburne Falls, MA 01370
NEP will make an attempt to provide a copy of the ENF Form through online portals when applicable.		

Environmental Justice (EJ) Reference List

First Name	Last Name	Title	Phone	Email	Affiliation
Heather	Clish	Director of Conservation & Recreation Policy	(617) 523-0655	hclish@outdoors.org	Appalachian Mountain Club
Kerry	Bowie	Board President	Not Provided	kerry@msaadapartners.com	Browning the GreenSpace
Alma	Gordon	President	Not Provided	tribalcouncil@chappaquiddickwampanoag.org	Chappaquiddick Tribe of the Wampanoag Nation
Patricia	D. Rocker	Council Chair	Not Provided	rockerpatriciad@verizon.net	Chappaquiddick Tribe of the Wampanoag Nation, Whale Clan
Cindy	Luppi	New England Director	(617) 338-8131 x208	cluppi@cleanwater.org	Clean Water Action
Sylvia	Broude	Executive Director	(617) 292-4821	sylvia@communityactionworks.org	Community Action Works
Ryan	Odonnell	Water Quality Monitoring Coordinator	Not Provided	rodonnell@ctriver.org	Connecticut River Conservancy
Ryan	Odonnell	Water Quality Monitoring Coordinator	Not Provided	rodonnell@ctriver.org	Connecticut River Conservancy
Johannes	Epke	Staff Attorney	(617) 850-1761	jepke@clf.org	Conservation Law Foundation
Britteny	Jenkins	Vice President		Bjenkins@clf.org	Conservation Law Foundation
Ben	Hellerstein	MA State Director	(617) 747-4368	ben@environmentmassachusetts.org	Environment Massachusetts
Amy	Boyd Rabin	Vice President of Policy	(617) 221-8258	aboydrabin@environmentalleague.org	Environmental League of Massachusetts
Zahra	Saifee	Policy & Advocacy Coordinator	(435) 632-9482	zsaifee@environmentalleague.org	Environmental League of Massachusetts
Melissa	Ferretti	Chair	(508) 304-5023	melissa@herringpondtribe.org	Herring Pond Wampanoag Tribe

Mark	Wamsley	Conservation Director	Not Provided	mark@kestreltrust.org	Kestrel Land Trust
Brian	Weeden	Chair	(774) 413-0520	Brian.Weeden@mwtribe-nsn.gov	Mashpee Wampanoag Tribe
David	Weeden	THPO/Director	(774) 327.0068	David.Weeden@mwtribe-nsn.gov	Mashpee Wampanoag Tribe
Nakia	Hendricks Jr.	Office Manager	Not Provided	106Review@mwtribe-nsn.gov	Mashpee Wampanoag Tribe
Heidi	Ricci	Director of Policy	Not Provided	hricci@massaudubon.org	Mass Audubon
Robb	Johnson	Executive Director	(978) 443-2233	robb@massland.org	Mass Land Trust Coalition
Julia	Blatt	Executive Director	(617) 714-4272	juliablatt@massriversalliance.org	Mass Rivers Alliance
John	Peters, Jr.	Executive Director	(617) 573-1292	john.peters@mass.gov	Massachusetts Commission on Indian Affairs (MCIA)
Elizabeth	Solomon	Not Provided	Not Provided	Solomon.Elizabeth@gmail.com	Massachusetts Tribe at Ponkapoag
Lena Miles	Entin Gresham	Interim Co-Directors	Not Provided	Lena@N2NMa.org Miles@N2NMa.org	Neighbor to Neighbor Mass.
Cheryll	Toney Holley	Chair	(774) 317-9138	crwritings@aol.com	Nipmuc Nation (Hassanamisco Nipmucs)
Raquel	Halsey	Executive Director	(617) 232-0343	rhalsey@naicob.org	North American Indian Center of Boston
Rob	Moir	Executive Director	Not Provided	rob@oceanriver.org	Ocean River Institute
Cora	Pierce	Not Provided	Not Provided	Coradot@yahoo.com	Pocassett Wampanoag Tribe
Sarita	Hudson	Director Programs & Development	(413) 794-7739	shudson@publichealthwm.org	Public Health Institute of Western Mass
Sarita	Hudson	Director Programs & Development	(413) 794-7739	shudson@publichealthwm.org	Public Health Institute of Western Mass
Vickash	Mohanka	Director, MA Chapter	Not Provided	vick.mohanka@sierraclub.org	Sierra Club MA

Stockbridge-Munsee Tribe		Historic Preservation Manager	(413) 884-6048	THPO@Mohican-nsn.gov	Stockbridge-Munsee Tribe
Jodi	Valenta	Massachusetts State Director	(617) 367-6200	Jodi.Valenta@tpl.org	The Trust for Public Land
Claire	B.W. Muller	Movement Building Director	(508) 308-9261	claire@uumassaction.org	Unitarian Universalist Mass Action Network
Bettina	Washington	Tribal Historic Preservation Officer	(508) 560-9014	thpo@wampanoagtribe-nsn.gov	Wampanoag Tribe of Gay Head (Aquinnah)

Appendix C – RMAT Tool

Environmental Notification Form (ENF)

Central To Western Massachusetts Energy Improvement Project

RMAT Report

Town of Auburn

Climate Resilience Design Standards Tool Project Report

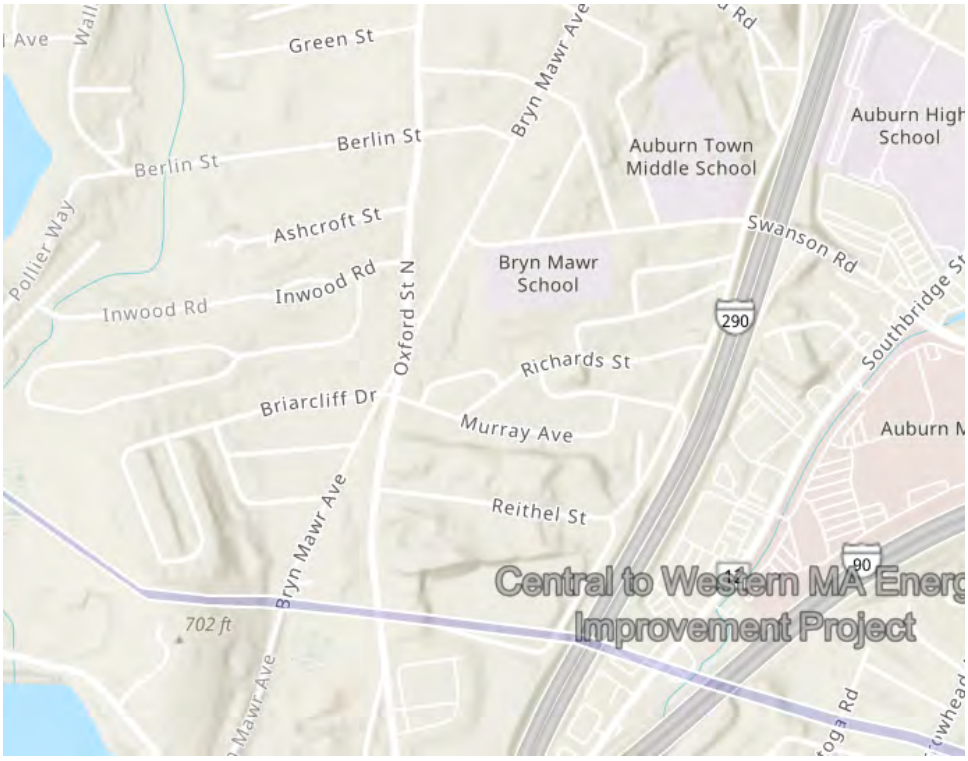
Central to Western MA Energy Improvement Project
Date Created: 5/16/2024 1:26:45 PM
Created By: JP
Date Report Generated: 5/18/2024 6:54:00 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: Yes

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	High Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "High Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is between 10% and 50%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 100ft of a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Existing impervious area of the project site is between 10% and 50%
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.3	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Auburn
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.
Project Submission Comments:	

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Belchertown

Climate Resilience Design Standards Tool Project Report

Central to Western MA Energy Improvement Project

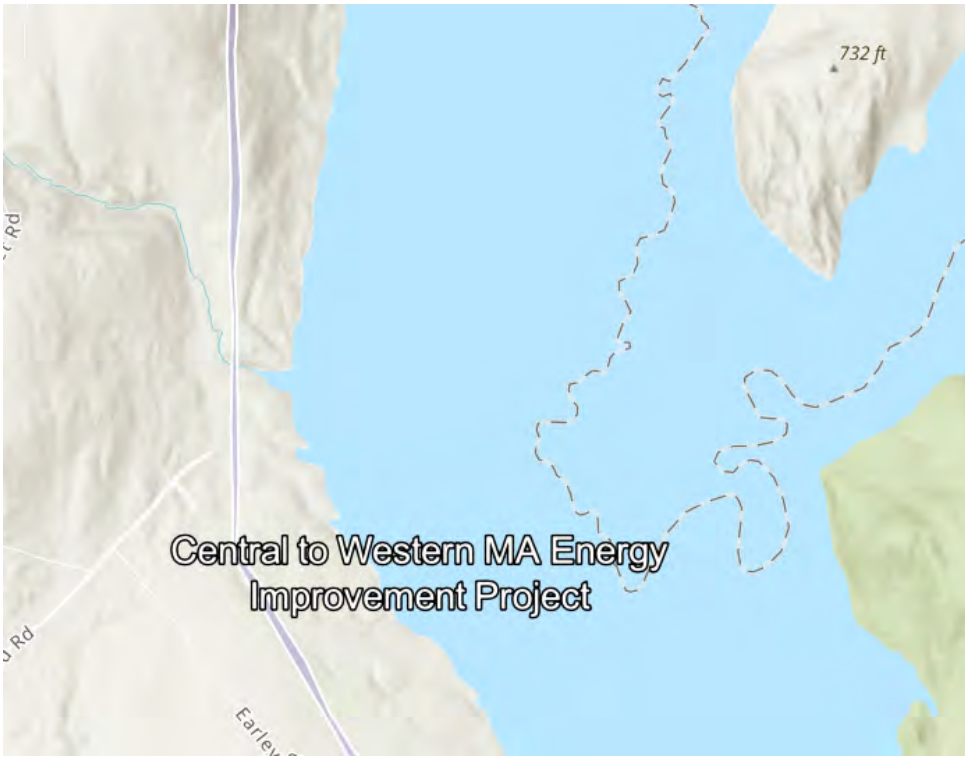
Date Created: 5/18/2024 1:17:38 PM
Created By: JP
Date Report Generated: 5/18/2024 1:35:16 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 100ft of a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Between 10% and 40% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.3	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Belchertown
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.

Project Submission Comments:

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Conway

Climate Resilience Design Standards Tool Project Report

Central to Western MA Energy Improvement Project
Date Created: 5/16/2024 6:18:00 PM
Created By: JP
Date Report Generated: 5/18/2024 12:04:43 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure

Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within 100ft of a waterbody
- Project is potentially susceptible to riverine erosion
- The project is not within a mapped FEMA floodplain [outside of the Massachusetts Coast Flood Risk Model (MC-FRM)]

Extreme Heat

This project received a "High Exposure" because of the following:

- Existing trees are being removed as part of the proposed project
- Between 10% and 40% of the existing project site has canopy cover
- 10 to 30 day increase in days over 90 deg. F within project's useful life
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	8.8	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Conway
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.

Project Submission Comments:

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Deerfield

Climate Resilience Design Standards Tool Project Report

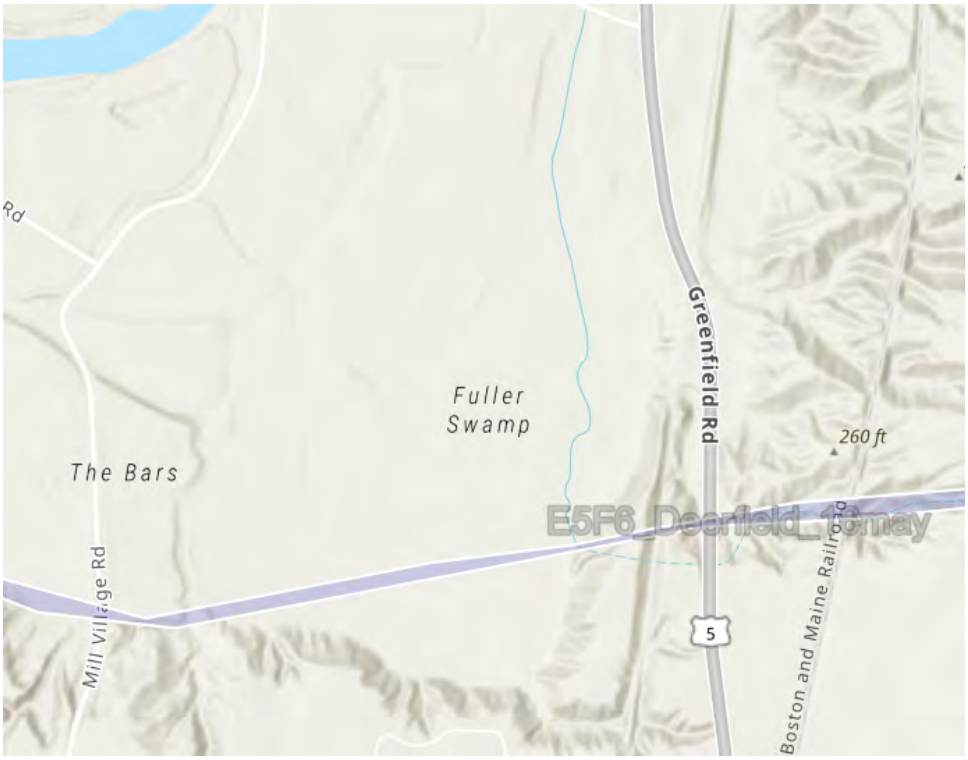
E5F6_Deerfield_16may
Date Created: 5/16/2024 6:21:01 PM
Created By: JP
Date Report Generated: 5/16/2024 6:52:41 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within 100ft of a waterbody
- Project is potentially susceptible to riverine erosion
- The project is not within a mapped FEMA floodplain [outside of the Massachusetts Coast Flood Risk Model (MC-FRM)]

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Existing impervious area of the project site is less than 10%
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	8.9	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	E5F6_Deerfield_16may
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Deerfield
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.

Project Submission Comments:

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of East Brookfield

Climate Resilience Design Standards Tool Project Report

Central to Western MA Energy Improvement Project_EB
Date Created: 5/18/2024 4:02:41 PM Created By: JP
Date Report Generated: 5/18/2024 4:20:29 PM Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure

Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 100ft of a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Less than 10% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.2	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project_EB
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Brookfield
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.
Project Submission Comments:	

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Leicester

Climate Resilience Design Standards Tool Project Report

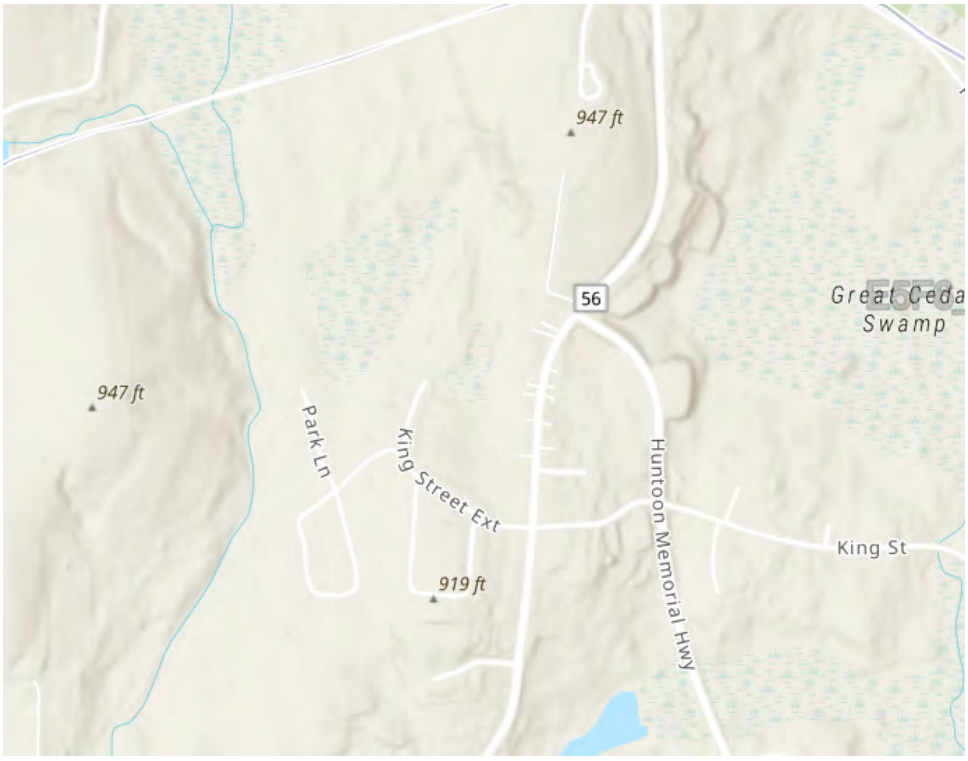
Central to Western MA Energy Improvement Project
Date Created: 5/18/2024 6:14:46 PM
Created By: JP
Date Report Generated: 5/18/2024 6:29:51 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: Yes

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 200ft of a waterbody and less than 30ft above the waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Less than 10% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.2	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat — High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Leicester
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.
Project Submission Comments:	

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Leverett

Climate Resilience Design Standards Tool Project Report

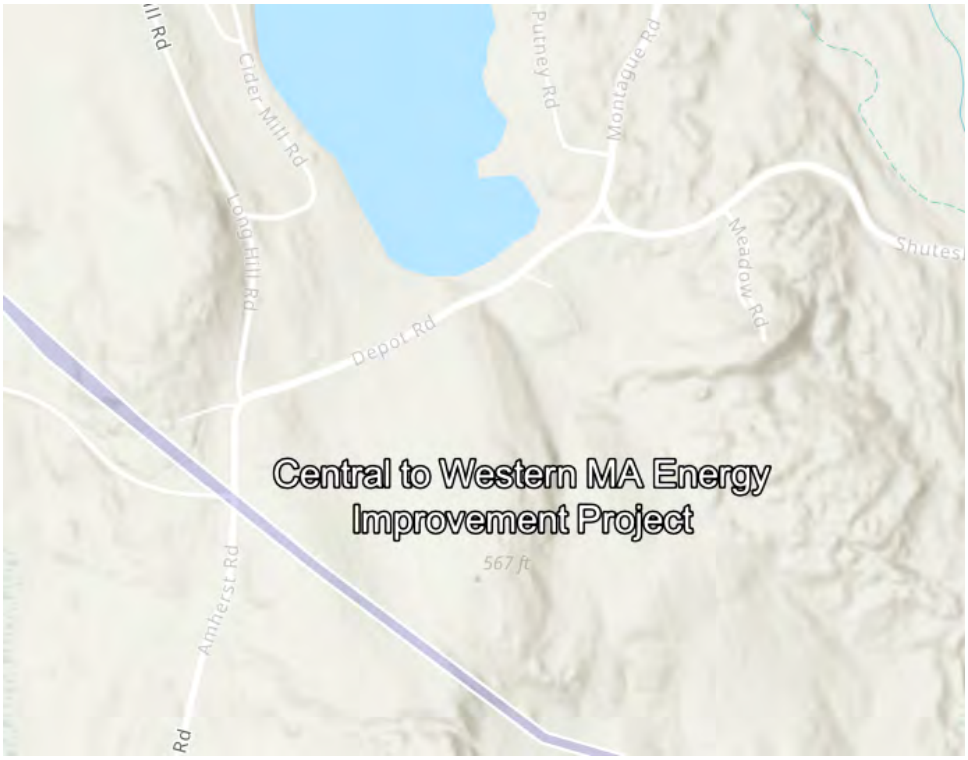
Central to Western MA Energy Improvement Project
Date Created: 5/17/2024 10:47:54 AM
Created By: JP
Date Report Generated: 5/18/2024 10:48:55 AM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: Yes

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within 500ft of a waterbody and less than 20ft above the waterbody
- The project is not within a mapped FEMA floodplain [outside of the Massachusetts Coast Flood Risk Model (MC-FRM)]
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Between 10% and 40% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.3	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Leverett
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.

Project Submission Comments:

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Millbury

Climate Resilience Design Standards Tool Project Report

Central to Western MA Energy Improvement Project
Date Created: 5/18/2024 6:57:32 PM
Created By: JP
Date Report Generated: 5/18/2024 7:09:42 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: Yes

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure

Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 100ft of a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Between 10% and 40% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.4	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Millbury
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.

Project Submission Comments:

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of North Brookfield

Climate Resilience Design Standards Tool Project Report

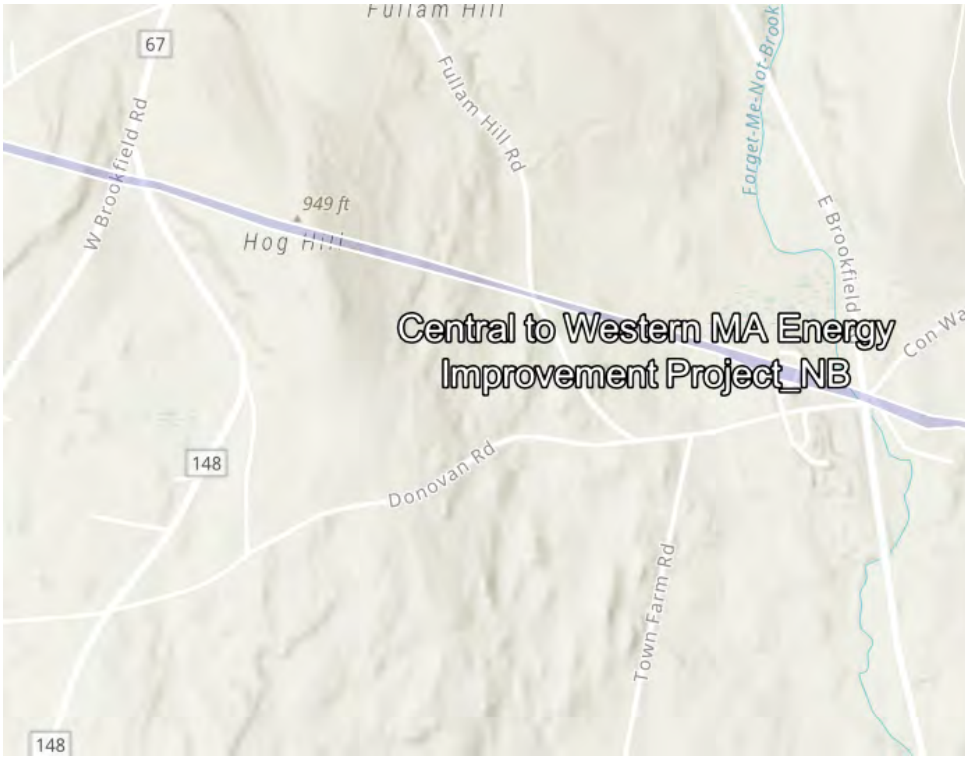
Central to Western MA Energy Improvement Project_NB
Date Created: 5/18/2024 3:37:19 PM
Created By: JP
Date Report Generated: 5/18/2024 7:10:49 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Project is more than 500ft from a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Less than 10% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.1	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project_NB
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Brookfield
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.

Project Submission Comments:

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Pelham

Climate Resilience Design Standards Tool Project Report

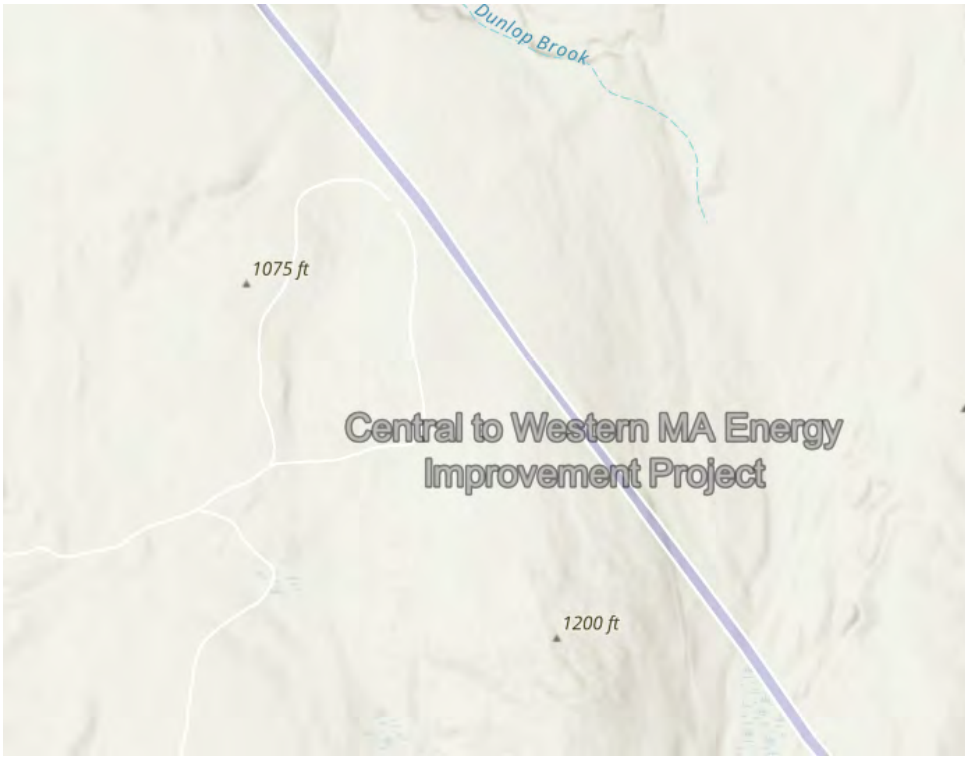
Central to Western MA Energy Improvement Project
Date Created: 5/18/2024 12:52:19 PM
Created By: JP
Date Report Generated: 5/18/2024 1:12:54 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 200ft of a waterbody and less than 30ft above the waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Between 10% and 40% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.6	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Pelham
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.

Project Submission Comments:

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Shelburne

Climate Resilience Design Standards Tool Project Report

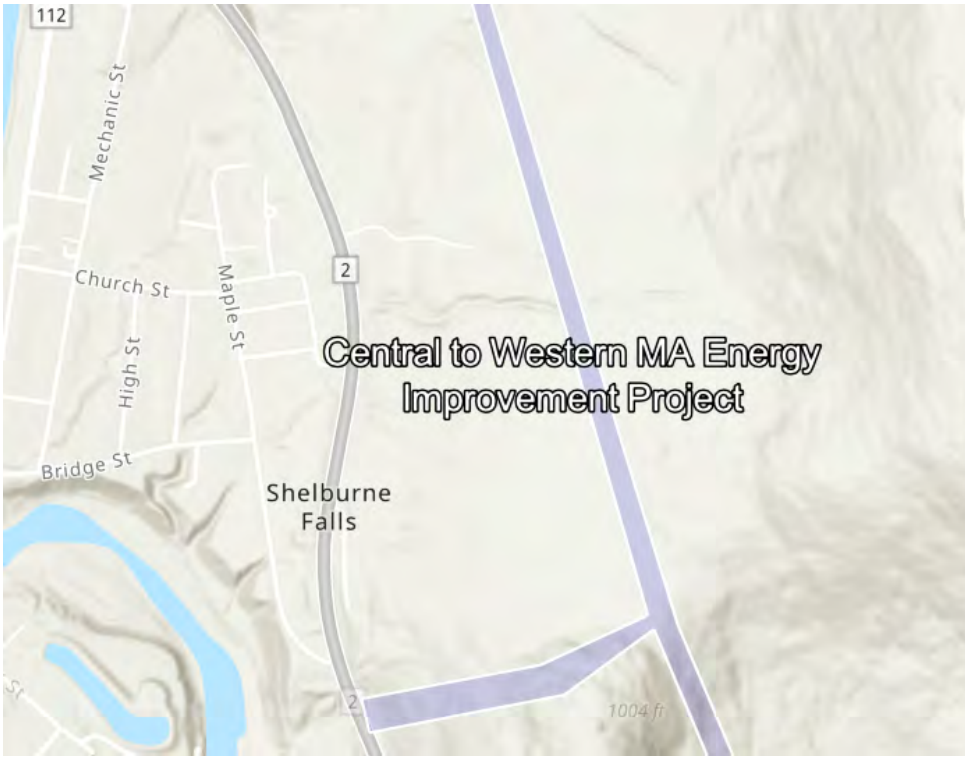
Central to Western MA Energy Improvement Project
Date Created: 5/16/2024 1:45:10 PM
Created By: JP
Date Report Generated: 5/16/2024 4:04:10 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: Yes

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	High Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "High Exposure" because of the following:

- Increased impervious area
- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Project is potentially susceptible to riverine erosion
- The project is not within a mapped FEMA floodplain [outside of the Massachusetts Coast Flood Risk Model (MC-FRM)]
- Project is more than 500ft from a waterbody

Extreme Heat

This project received a "High Exposure" because of the following:

- Increased impervious area
- Existing trees are being removed as part of the proposed project
- Existing impervious area of the project site is less than 10%
- 10 to 30 day increase in days over 90 deg. F within project's useful life
- Located within 100 ft of existing water body

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	8.7	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat — High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Shelburne
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Millbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires need replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.

Project Submission Comments:

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	Yes
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Shutesbury

Climate Resilience Design Standards Tool Project Report

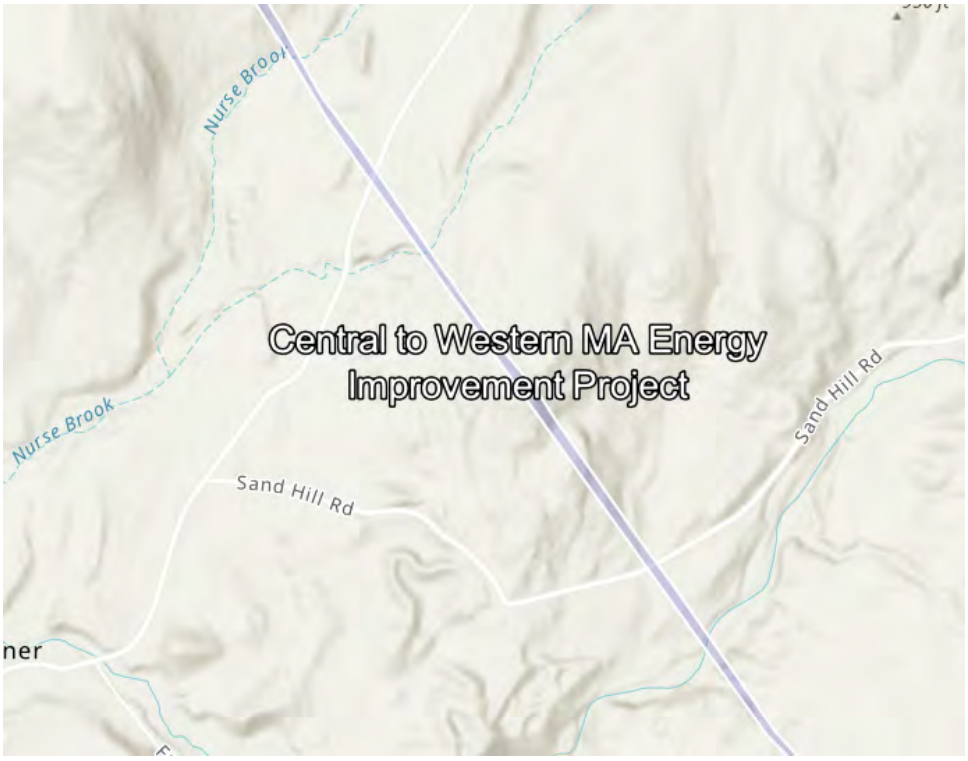
Central to Western MA Energy Improvement Project
Date Created: 5/18/2024 12:23:28 PM
Created By: JP
Date Report Generated: 5/18/2024 12:47:15 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within 100ft of a waterbody
- The project is not within a mapped FEMA floodplain [outside of the Massachusetts Coast Flood Risk Model (MC-FRM)]
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Between 10% and 40% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.4	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Shutesbury
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.

Project Submission Comments:

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Spencer

Climate Resilience Design Standards Tool Project Report

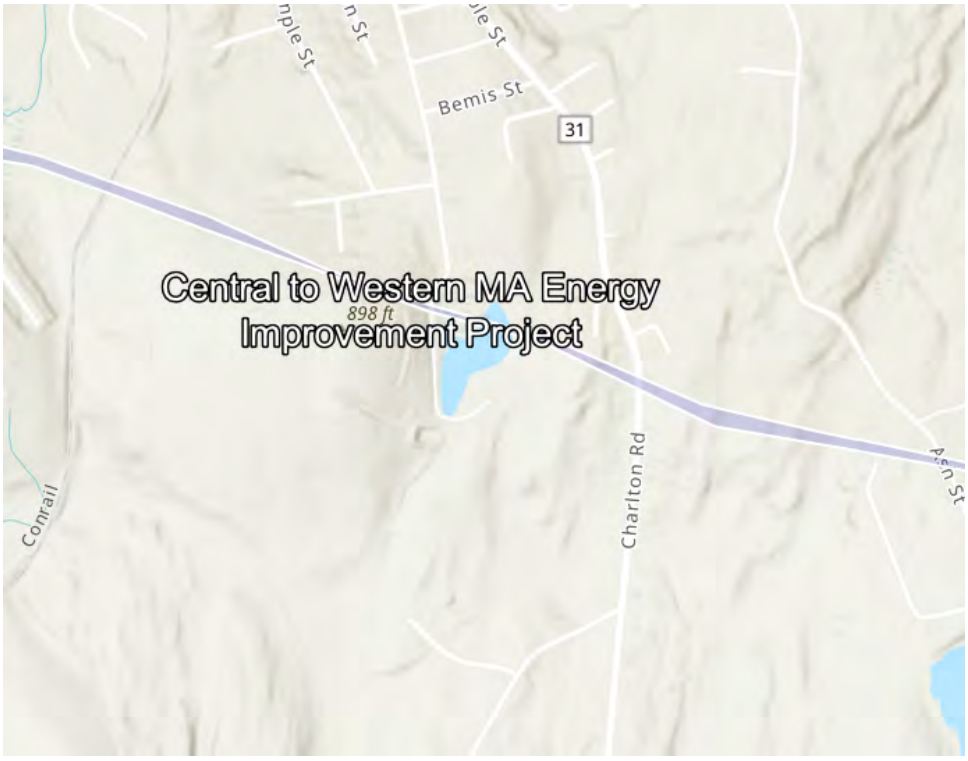
Central to Western MA Energy Improvement Project
Date Created: 5/18/2024 5:45:16 PM
Created By: JP
Date Report Generated: 5/18/2024 6:10:10 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: Yes

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 100ft of a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Between 10% and 40% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.2	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Spencer
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.
Project Submission Comments:	

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Sunderland

Climate Resilience Design Standards Tool Project Report

Climate Resilience Design Standards Tool Project Report
Date Created: 12/3/2024 10:50:48 AM
Created By: JP
Date Report Generated: 12/3/2024 4:16:52 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: Yes

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure

Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within 100ft of a waterbody
- Project is potentially susceptible to riverine erosion
- The project is not within a mapped FEMA floodplain [outside of the Massachusetts Coast Flood Risk Model (MC-FRM)]

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Between 10% and 40% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.1	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Climate Resilience Design Standards Tool Project Report
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Sunderland
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.

Project Submission Comments:

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Ware - #1

Climate Resilience Design Standards Tool Project Report

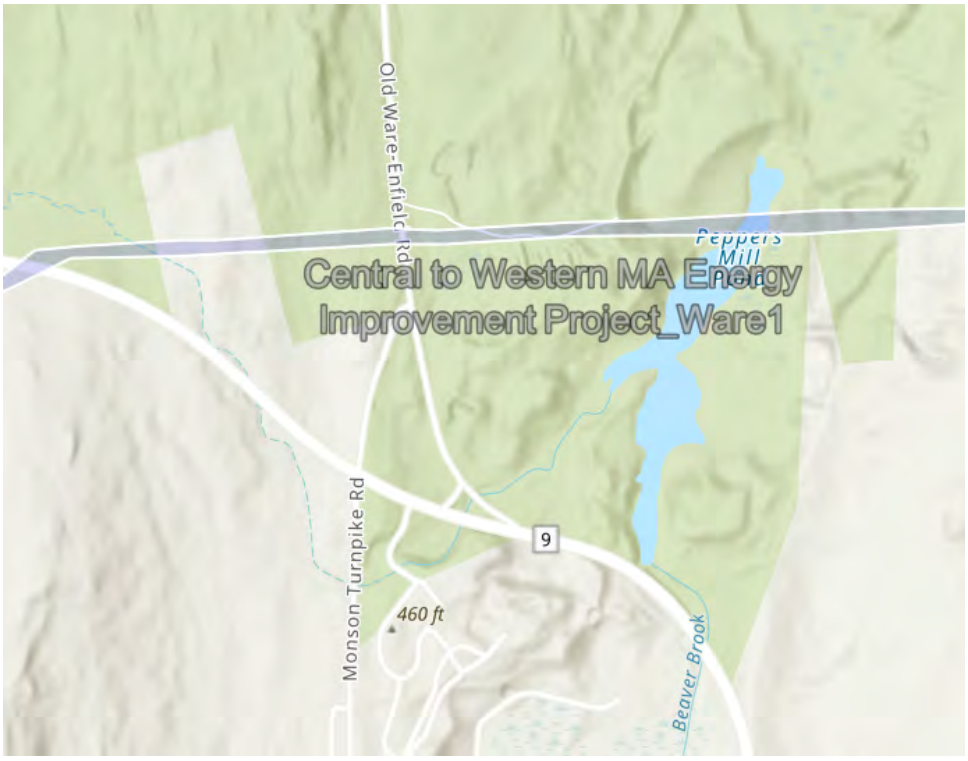
Central to Western MA Energy Improvement Project_Ware1
Date Created: 5/18/2024 1:57:34 PM
Created By: JP
Date Report Generated: 5/18/2024 2:34:05 PM
Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 100ft of a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Less than 10% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.3	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project_Ware1
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Ware
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.
Project Submission Comments:	

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes

Provides recreation	Yes
Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of Ware - #2

Climate Resilience Design Standards Tool Project Report

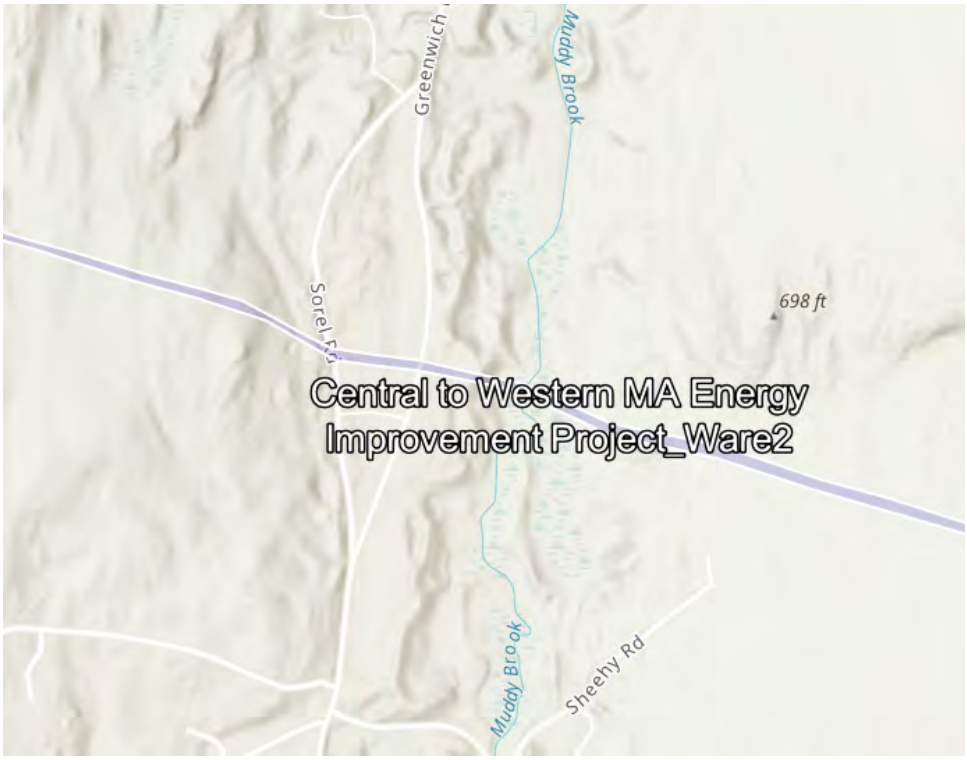
Central to Western MA Energy Improvement Project_Ware2
Date Created: 5/18/2024 2:38:33 PM Created By: JP
Date Report Generated: 5/18/2024 2:54:43 PM Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 100ft of a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Less than 10% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.2	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat — High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project_Ware2
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Ware
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	NEP owns and operates double-circuit 69 kV lines (E5 and F6 lines) that begins at the Deerfield #4 Substation in Shelburne through Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and terminating at the Milbury #305 Substation in Millbury. Tap lines consist of the existing Quabbin Switch Tap (E5W/F6W) in Belchertown, Deerfield #3 in Shelburne, Pondville Sub Tap in Auburn, Leicester Sub Tap in Leicester, and Lashway Sub Tap in North Brookfield. The E5/F6 lines were constructed in the early 1900s and refurbished in 2001. Structures and wires are in need of replacement due to asset condition and aging infrastructure. In addition, the access conditions vary considerably throughout the ROW. Although the new E5/F6 Transmission Lines will operate at 69 kV when they are first placed into service, they are being designed and built to support operation at 115 kV at some point during their expected life.
Project Submission Comments:	

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes

Provides recreation	Yes
Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials are expected with relatively easy cleanup

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Town of West Brookfield

Climate Resilience Design Standards Tool Project Report

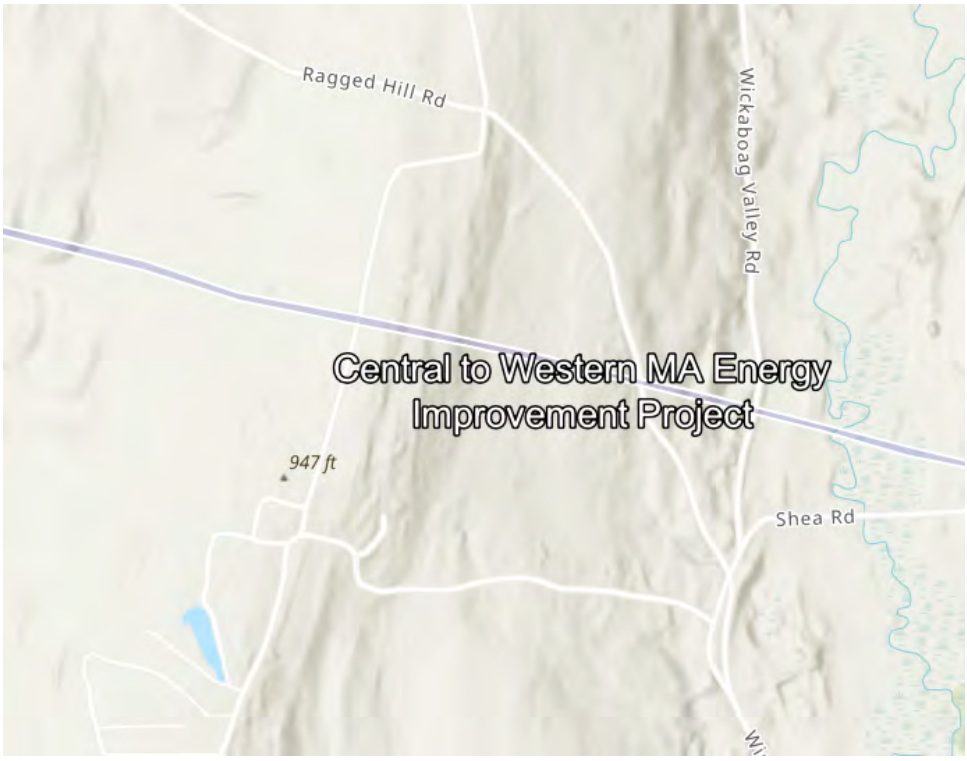
Central to Western MA Energy Improvement Project_WB
Date Created: 5/18/2024 2:59:33 PM Created By: JP
Date Report Generated: 5/18/2024 3:31:41 PM Tool Version: Version 1.2
Project Contact Information: Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)

Project Summary

Link to Project

Estimated Capital Cost: $100000000.00
End of Useful Life Year: 2075
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	Moderate Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Infrastructure	Low Risk	High Risk	High Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Infrastructure					
Extreme Precipitation					
Infrastructure	2070			50-yr (2%)	Tier 3
Extreme Heat					
Infrastructure	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 100ft of a waterbody
- Project is potentially susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Between 10% and 40% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Infrastructure
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Cost to replace is greater than $100 million
- Spills and/or releases of hazardous materials would be relatively easy to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Infrastructure — Infrastructure

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Infrastructure	2070	50-Year (2%)	9.1	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Project Inputs

Core Project Information

Name:	Central to Western MA Energy Improvement Project_WB
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2075
Location of Project:	Brookfield
Estimated Capital Cost:	$100,000,000
Who is the Submitting Entity?	Private Other National Grid Michael Tyrrell (Michael.Tyrrell@nationalgrid.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
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Project Submission Comments:

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project filters stormwater using green infrastructure
- ✓ Project provides pollinator habitat
- ✓ Project provides recreation

Factors to Improve Output

- ✓ Incorporate strategies that reduce carbon emissions
- ✓ Identify opportunities to prevent pollutants from impacting ecosystems

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
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Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Maybe
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Maybe
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	Yes
Provides recreation	Yes

Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Unsure
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Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Infrastructure
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 50

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The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

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If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
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Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Appendix D – Environmental Justice

Environmental Notification Form (ENF)

Central To Western Massachusetts Energy Improvement Project

EJ Locus Map

Screening Form

EJ Reference List

Advance Notification Submittal

Invite to Metting Submittal

Legal Ad Submittal

Appendix D – Environmental Justice
EJ Locus Map

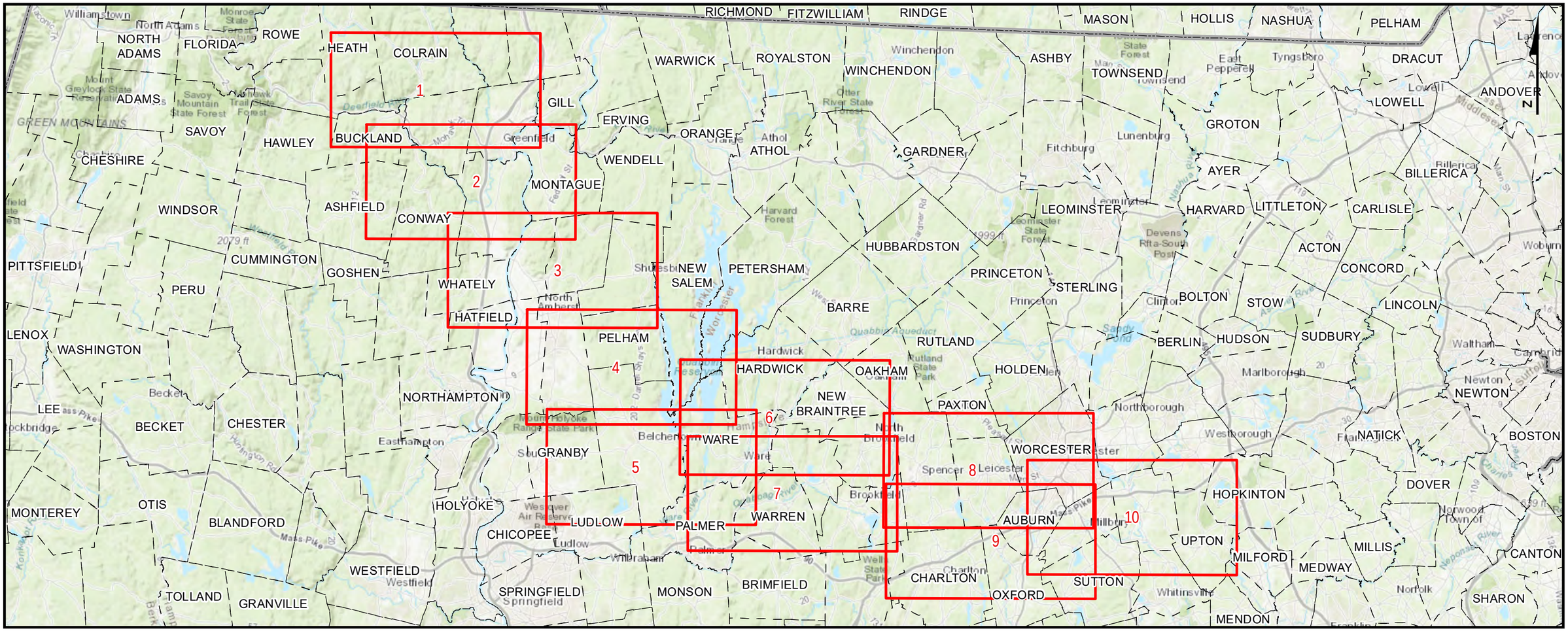
BSC Project Number: 100181.00

Central to Western Massachusetts Energy Improvement Project

Environmental Justice Populations Site Location Map

Shelburne, Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn & Millbury, MA

December 12, 2024



PREPARED FOR:

nationalgrid

170 Data Drive
Waltham, MA 02451

INDEX OF FIGURES

T1 - TITLE SHEET
S1 - SITE LOCATION MAP
1 - 10 - MAP SHEETS

ISSUED FOR PERMITTING
NOT CONSTRUCTION

PREPARED BY:

BSC GROUP

1 Mercantile Street Suite 601
Worcester, MA 01608

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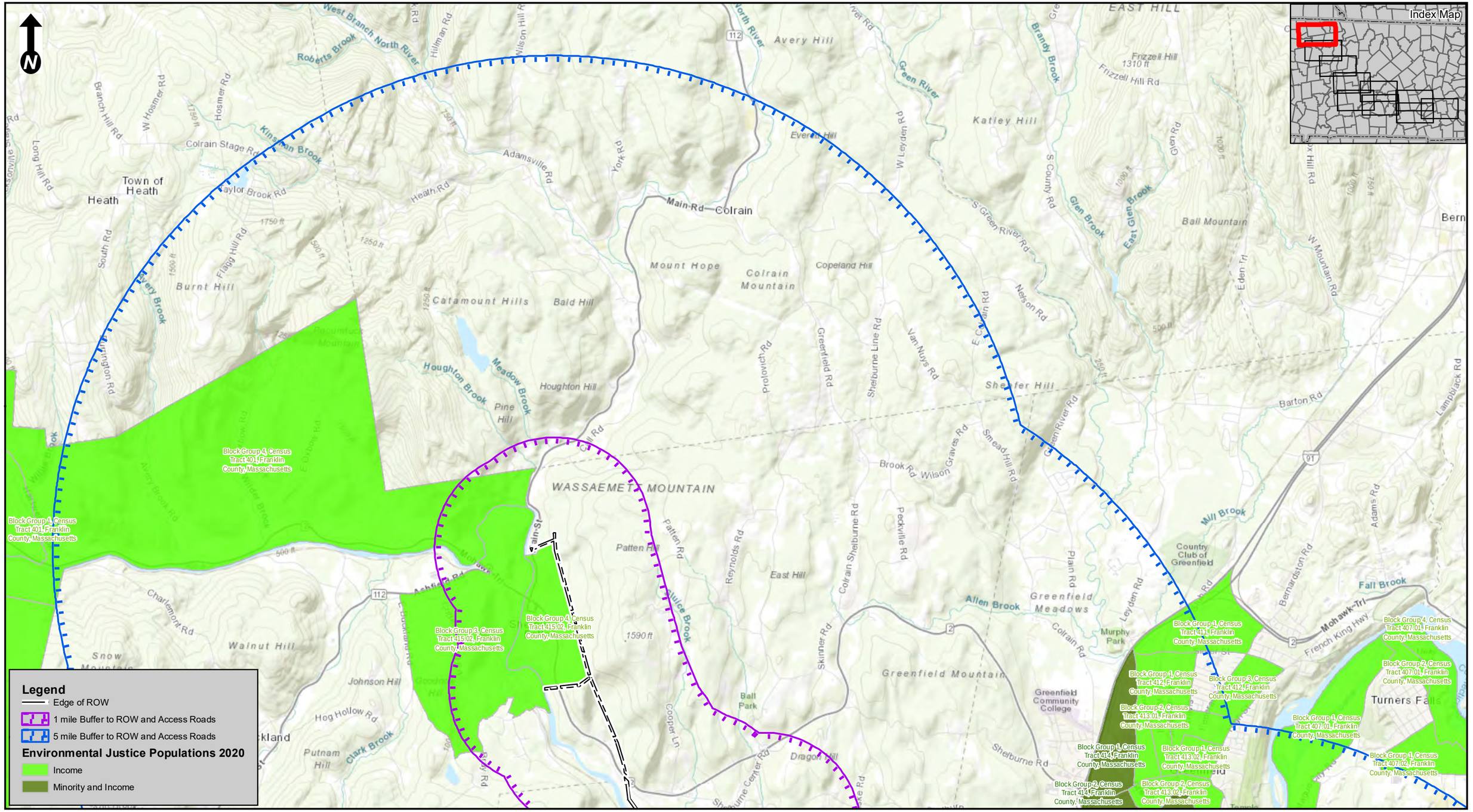
N
Index Map
Legend
Edge of ROW
1 mile Buffer to ROW and Access Roads
5 mile Buffer to ROW and Access Roads
Environmental Justice Populations 2020
Income
Minority and Income
Block Group 4, Census Tract 401, Franklin County, Massachusetts
Block Group 1, Census Tract 401, Franklin County, Massachusetts
Block Group 3, Census Tract 415.02, Franklin County, Massachusetts
Block Group 4, Census Tract 415.02, Franklin County, Massachusetts
Block Group 1, Census Tract 412, Franklin County, Massachusetts
Block Group 3, Census Tract 412, Franklin County, Massachusetts
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Block Group 2, Census Tract 407.01, Franklin County, Massachusetts
Block Group 1, Census Tract 407.01, Franklin County, Massachusetts
Block Group 1, Census Tract 407.02, Franklin County, Massachusetts
Town of Heath
Main Rd—Colrain
Avery Hill
Everett Hill
Katley Hill
Frizzell Hill
1310 ft
Frizzell Hill Rd
Ball Mountain
Burnt Hill
Mount Hope
Colrain Mountain
Copeland Hill
Catamount Hills
Bald Hill
Houghton Hill
Pine Hill
Patten Hill
East Hill
Greenfield Meadows
Greenfield Mountain
Greenfield Community College
Country Club of Greenfield
Murphy Park
Ball Park
Walnut Hill
Johnson Hill
Snow Mountain
Putnam Hill
Dragon Hill
Turners Falls
WASSAEMETT MOUNTAIN
Roberts Brook
West Branch North River
Kinsman Brook
Adamsville Rd
Heath Rd
Colrain Stage Rd
Taylor Brook Rd
Flagg Hill Rd
Hosmer Rd
W Hosmer Rd
Branch Hill Rd
Long Hill Rd
South Rd
Hillman Rd
Wilson Hill Rd
York Rd
North River
Green River
W Leyden Rd
Brandy Brook
S County Rd
S Green River Rd
Glen Rd
Glen Brook
East Glen Brook
Eden Trl
W Mountain Rd
Nelson Rd
Barton Rd
Lampblack Rd
Meadow Brook
Houghton Brook
Prolovich Rd
Greenfield Rd
Shelburne Line Rd
Van Nuys Rd
Sheafer Hill
Brook Rd
Wilson Graves Rd
Smead Hill Rd
Sluice Brook
Patten Rd
Reynolds Rd
Colrain Shelburne Rd
Peckville Rd
Skinner Rd
Cooper Ln
Shelburne Center Rd
Shelburne Rd
Plain Rd
Leyden Rd
Colrain Rd
Allen Brook
Mill Brook
Fall Brook
Bernardston Rd
Adams Rd
Mohawk Trl
French King Hwy
Charlemont Rd
Hog Hollow Rd
Clark Brook
Avery Brook Rd
Miller Brook
Millers River Rd
Chickley River Rd
Ashfield Rd
Doubleday Rd
Pudding Hill Rd
Mohawk Trail
Old Stage Rd
Old Colrain Rd
Old Shelburne Rd
Old Greenfield Rd
Old Main St
Old Bernardston Rd
Old Adams Rd
Old Mill Rd
Old Wilson Rd
Old Sheafer Hill Rd
Old Barton Rd
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Old Mohawk Trl
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Old Meadow Brook Rd
Old Houghton Brook Rd
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Old Van Nuys Rd
Old Prolovich Rd
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Old Houghton Brook Rd
Old Sluice Brook Rd
Old Patten Rd
Old Reynolds Rd
Old Colrain Shelburne Rd
Old Peckville Rd
Old Skinner Rd
Old Cooper Ln
Old Shelburne Center Rd
Old Dragon Hill Rd
Old Greenfield Mountain Rd
Old Ball Park Rd
Old Murphy Park Rd
Old Greenfield Meadows Rd
Old Country Club of Greenfield Rd
Old Turners Falls Rd
Old Temple Rd
Old Walnut Hill Rd
Old Johnson Hill Rd
Old Snow Mountain Rd
Old Putnam Hill Rd
Old Clark Brook Rd
Old Hog Hollow Rd
Old Charlemont Rd
Old Ashfield Rd
Old Doubleday Rd
Old Pudding Hill Rd
Old Mohawk Trail
Old Stage Rd
Old Colrain Rd
Old Shelburne Rd
Old Greenfield Rd
Old Main St
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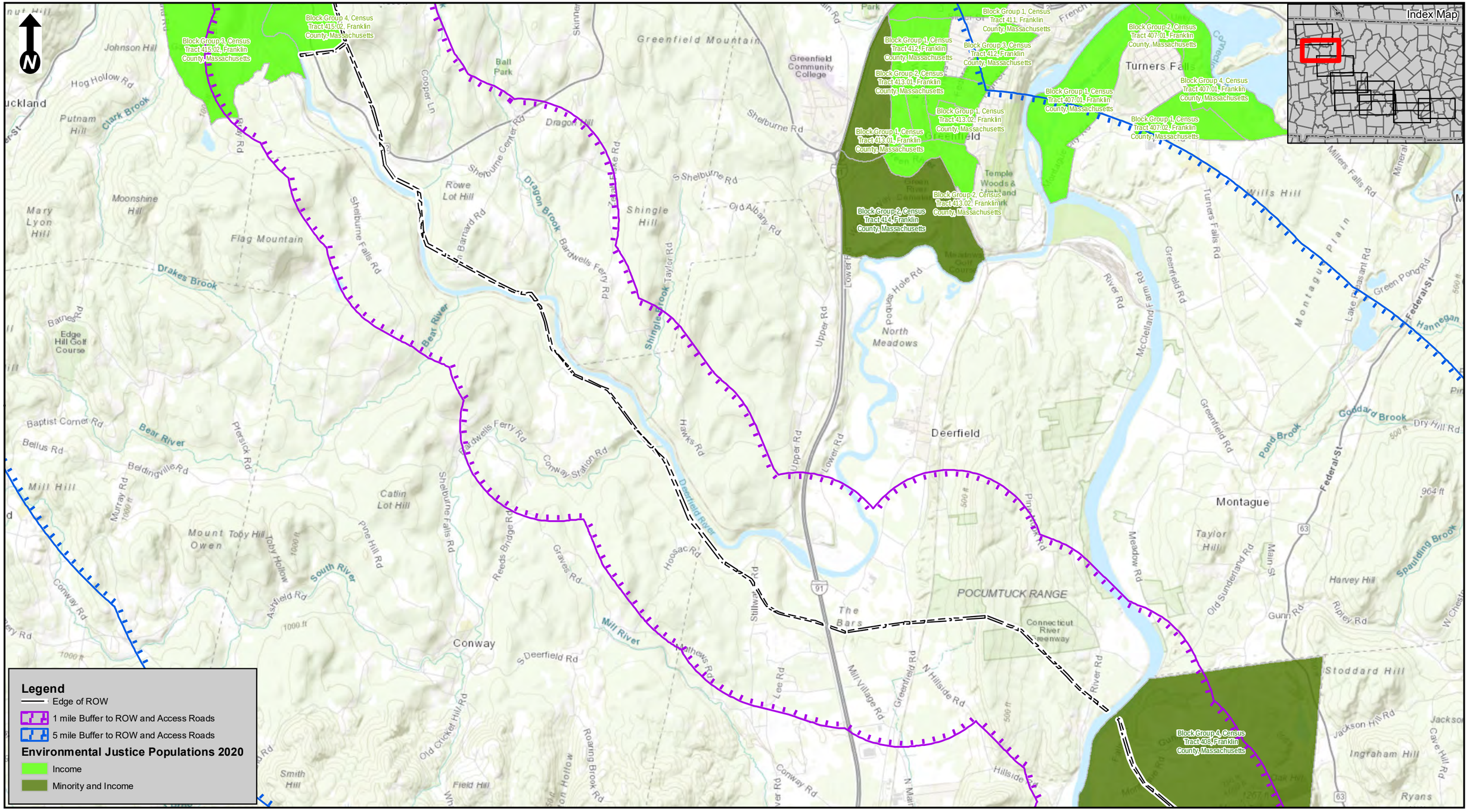
Old Mohawk Trl
Old French King Hwy



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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT
Environmental Justice Populations Site Location Map
Shelburne, Conway, Deerfield & Sunderland, MA
Page 2 of 10

Source: 2013 National Geographic Society, i-cubed

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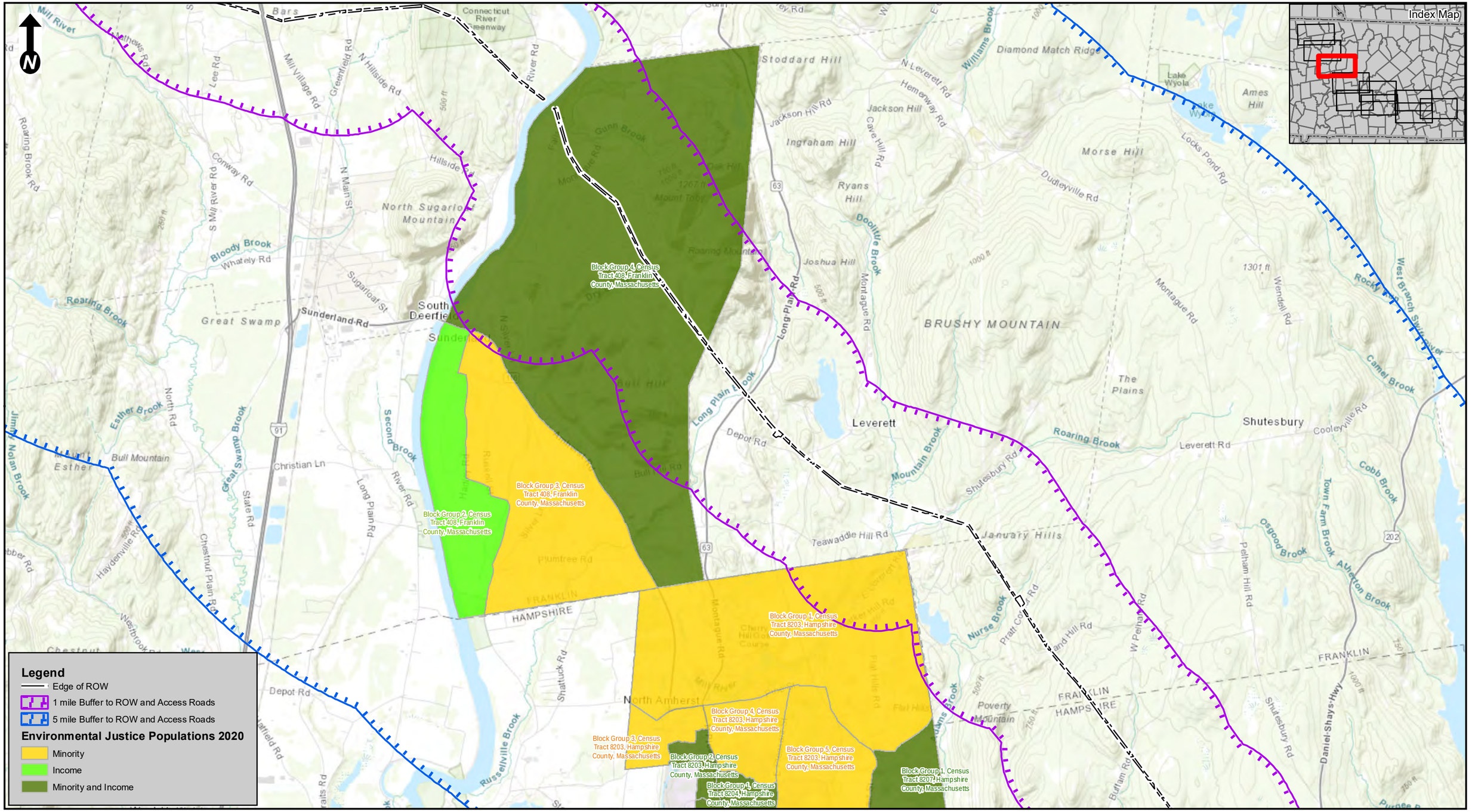

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1 inch = 5,000 feet
(page size: 11 X 17)
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Feet

CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT
Environmental Justice Populations Site Location Map
Deerfield, Sunderland, Leverett, Shutesbury & Pelham, MA
Page 3 of 10

Source: 2013 National Geographic Society, i-cubed

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BSC GROUP

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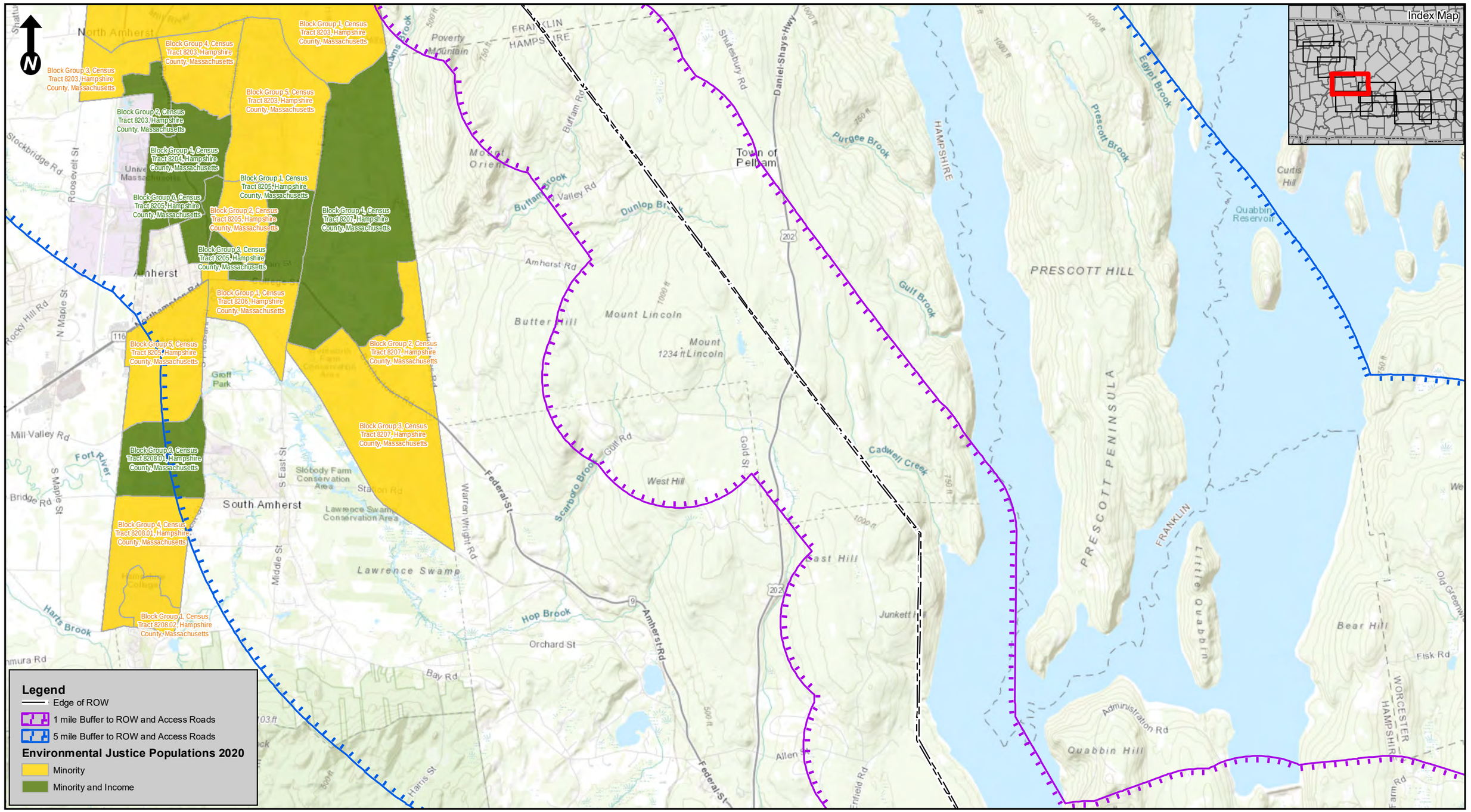

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT
Environmental Justice Populations Site Location Map
Shutesbury, Pelham & Belchertown, MA
Page 4 of 10

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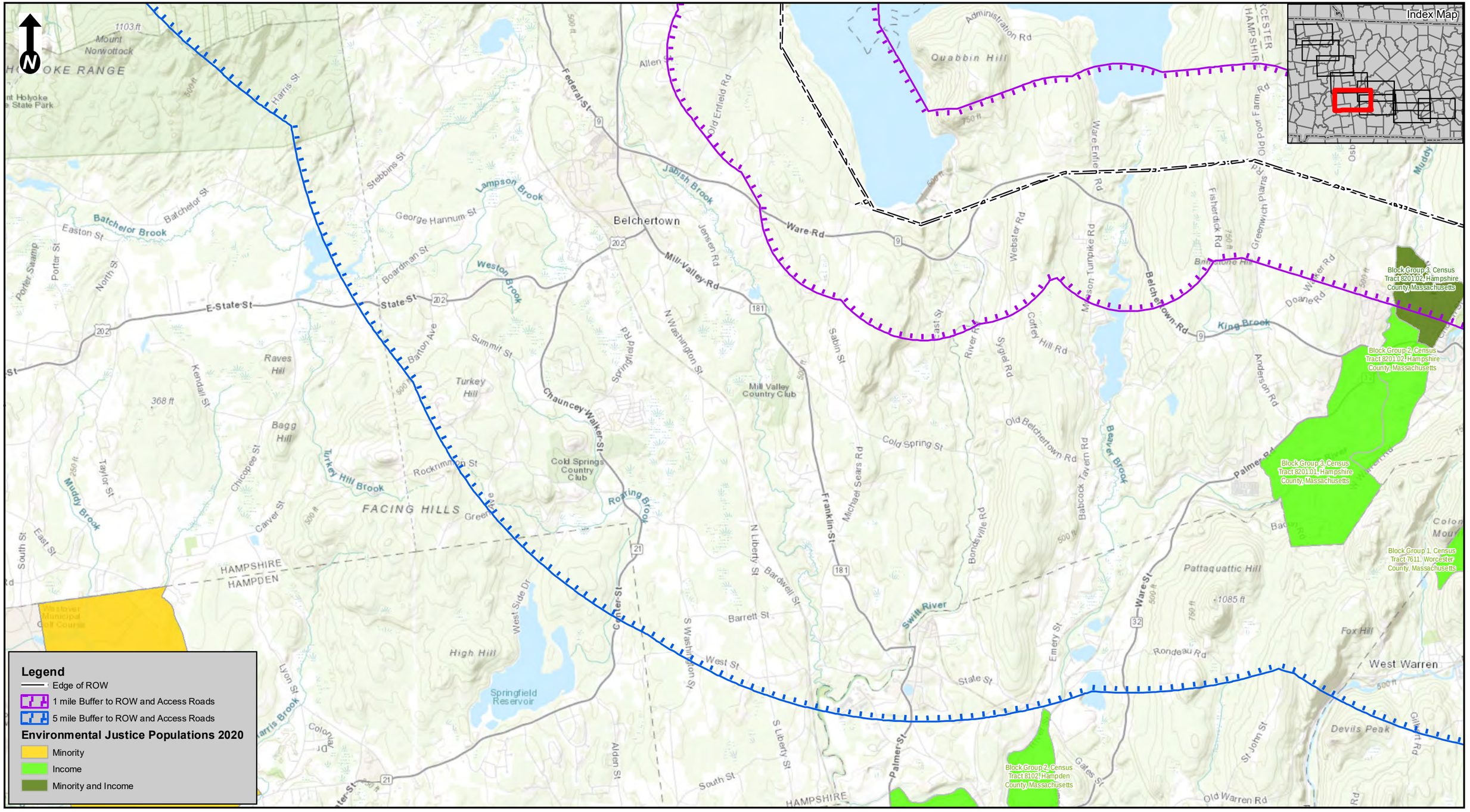

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT
Environmental Justice Populations Site Location Map
Belchertown & Ware, MA
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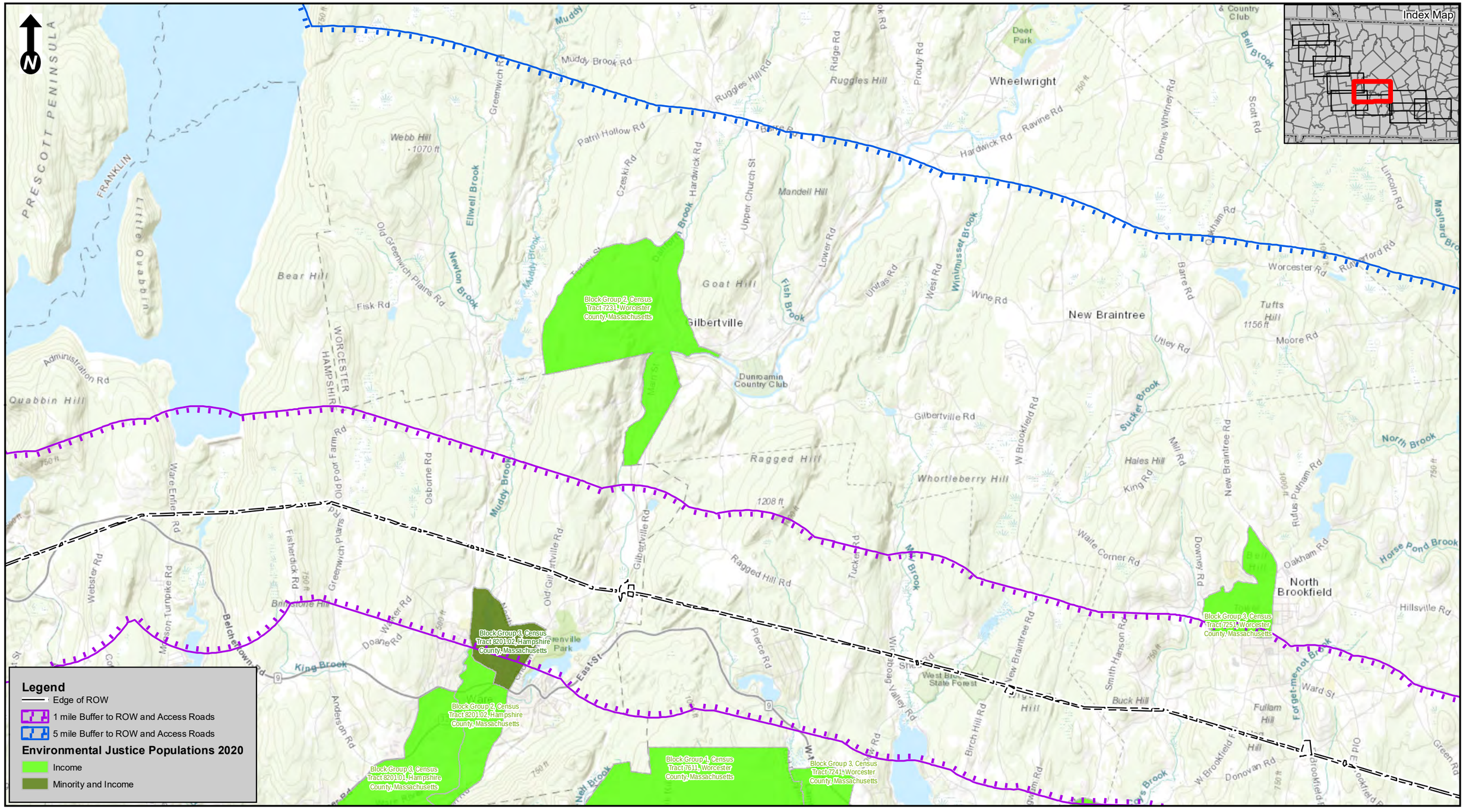
Index Map
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Block Group 3, Census Tract 8201.02, Hampshire County, Massachusetts
Block Group 2, Census Tract 8201.02, Hampshire County, Massachusetts
Block Group 3, Census Tract 8201.01, Hampshire County, Massachusetts
Block Group 1, Census Tract 7611, Worcester County, Massachusetts
Block Group 3, Census Tract 7241, Worcester County, Massachusetts
Block Group 3, Census Tract 7251, Worcester County, Massachusetts
Legend
Edge of ROW
1 mile Buffer to ROW and Access Roads
5 mile Buffer to ROW and Access Roads
Environmental Justice Populations 2020
Income
Minority and Income
Gilbertville
New Braintree
North Brookfield
Wheelwright
Dunroamin Country Club
Quabbin Hill
Bear Hill
Webb Hill
Goat Hill
Mandell Hill
Ragged Hill
Whortleberry Hill
Tufts Hill
Fullam Hill
Buck Hill
Hales Hill
Deer Park
Muddy Brook Rd
Ruggles Hill Rd
Patrl Hollow Rd
Hardwick Rd
Ravine Rd
Fisk Rd
Wine Rd
Utley Rd
Moore Rd
Worcester Rd
Gilbertville Rd
Ragged Hill Rd
Oakham Rd
Hillsville Rd
Ward St
Donovan Rd
Webster Rd
Maison Turnpike Rd
Belchertown Rd
King Brook
Ellwell Brook
Newton Brook
Fish Brook
Winimusset Brook
Sucker Brook
North Brook
Horse Pond Brook
Forget-me-not Brook
Scott Rd
Bell Brook
Lincoln Rd
Barre Rd
Rufus Putnam Rd
Dennis Whitney Rd
Downey Rd
Smith Hanson Rd
Birch Hill Rd
Pierce Rd
Tucker Rd
Old Gilbertville Rd
Old Greenwich Plains Rd
Osborne Rd
Ware Enfield Rd
Fisherdick Rd
Doane Rd
Anderson Rd
Administration Rd
Prouty Rd
Ridge Rd
Lower Rd
Upper Church St
Hardwick Rd
Czeski Rd
Greenwich Rd
Old Post Farm Rd
Brookfield Rd
Green Rd
Maynard Brook
Muddy Brook
Dunn Brook
Mill Brook
Valley Rd
West Rd
Unitas Rd
Main St
East St
Tucker St
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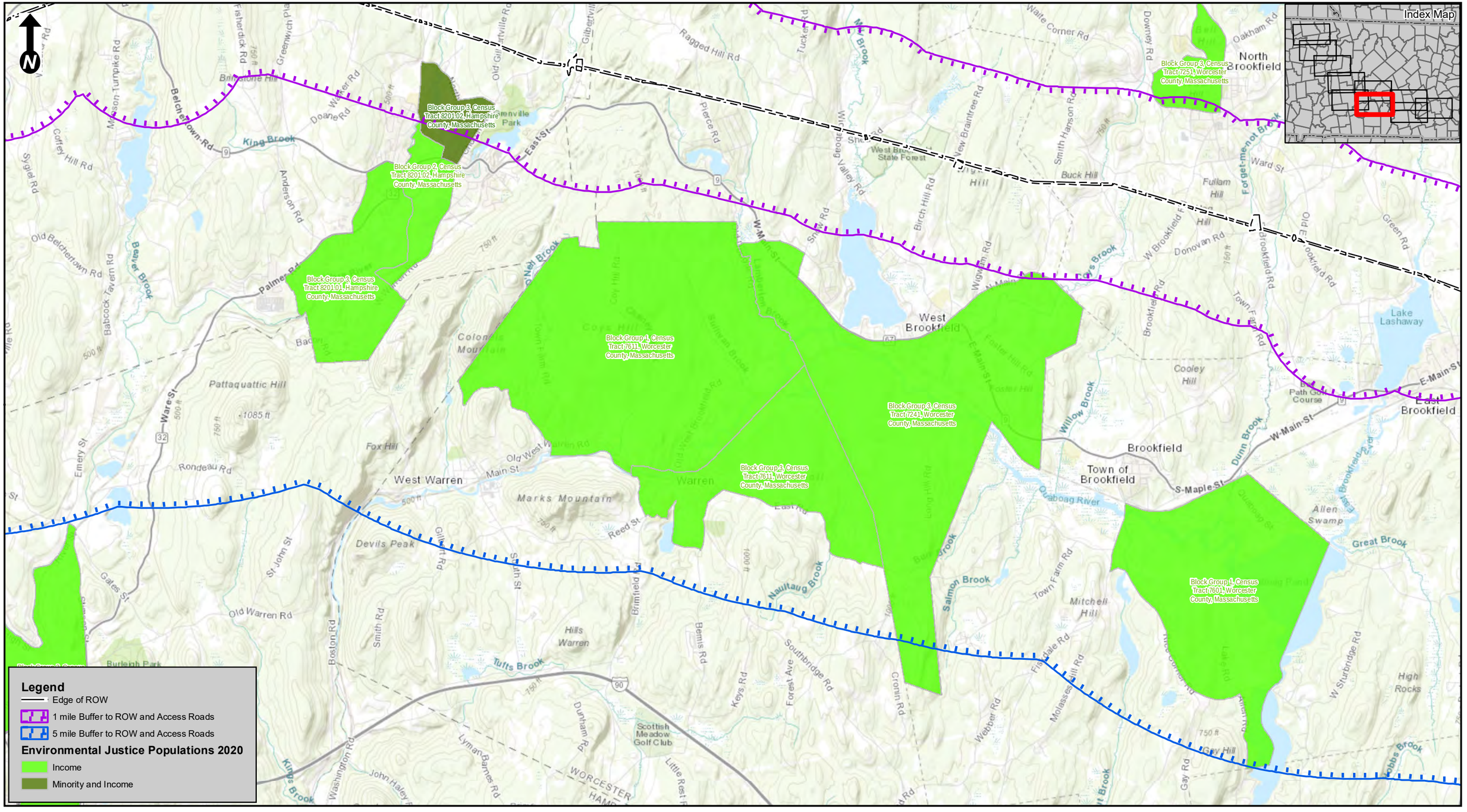
Country Club
Bell Brook
Scott Rd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Block Group 3, Census Tract 7241, Worcester County, Massachusetts
Block Group 3, Census Tract 7611, Worcester County, Massachusetts
Block Group 3, Census Tract 7251, Worcester County, Massachusetts
Block Group 1, Census Tract 7601, Worcester County, Massachusetts
Legend
Edge of ROW
1 mile Buffer to ROW and Access Roads
5 mile Buffer to ROW and Access Roads
Environmental Justice Populations 2020
Income
Minority and Income
West Brookfield
North Brookfield
East Brookfield
Brookfield
Town of Brookfield
West Warren
Warren
Pattaquattic Hill
Colonels Mountain
Fox Hill
Marks Mountain
Devils Peak
Hills Warren
Cole Hill
Buck Hill
Fullam Hill
Cooley Hill
Mitchell Hill
Gay Hill
Lake Lashaway
Allen Swamp
High Rocks
Scottish Meadow Golf Club
Quaboag River
King Brook
Beaver Brook
Naultaug Brook
Tufts Brook
Great Brook
Dunn Brook
Willow Brook
Salmon Brook
Sullivan Brook
Cole Hill Rd
Belchertown Rd
East St
W Main St
E Main St
W Brookfield Rd
Ware St
Rondeau Rd
Old West Warren Rd
Old Belchertown Rd
Palmer Rd
Ragged Hill Rd
Pierce Rd
Donovan Rd
Ward St
Green Rd
Old E Brookfield Rd
Brookfield Rd
Town Farm Rd
Waite Corner Rd
Oakham Rd
Downey Rd
Smith Hanson Rd
Buck Hill Rd
Birch Hill Rd
Wigwam Rd
Fiske Hill Rd
Molasses Hill Rd
Webber Rd
Gay Rd
Keys Rd
Forest Ave
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Cronin Rd
Bemis Rd
Brimfield Rd
Boston Rd
Smith Rd
St John St
Gilbert Rd
Reed St
Durham Rd
Lyman Barnes Rd
Washington Rd
Old Warren Rd
Gates St
Emery St
Babcock Tavern Rd
Coffey Hill Rd
Sigiel Rd
Anderson Rd
Doane Rd
Webster Rd
Fisherdick Rd
Greenwich Plain Rd
Mattawan Turnpike Rd
Old Gilbertville Rd
Tucker Rd
Mill Brook
Lovell Hill Rd
Fiske Rd
Brookfield Rd
Path Golf Course
Burleigh Park
Greenville Park
West Brookfield State Forest
Lovell Hill
Fisher Hill Rd
Lake Rd
W Sturbridge Rd
Hobbs Brook
Little Rest Brook
Mill Brook
Old Brookfield Rd
Fiske Hill Rd
Town Farm Rd
Mitchell Hill
Gay Hill
Allen Swamp
Great Brook
Quaboag River
Dunn Brook
Willow Brook
Salmon Brook
Naultaug Brook
Tufts Brook
King Brook
Beaver

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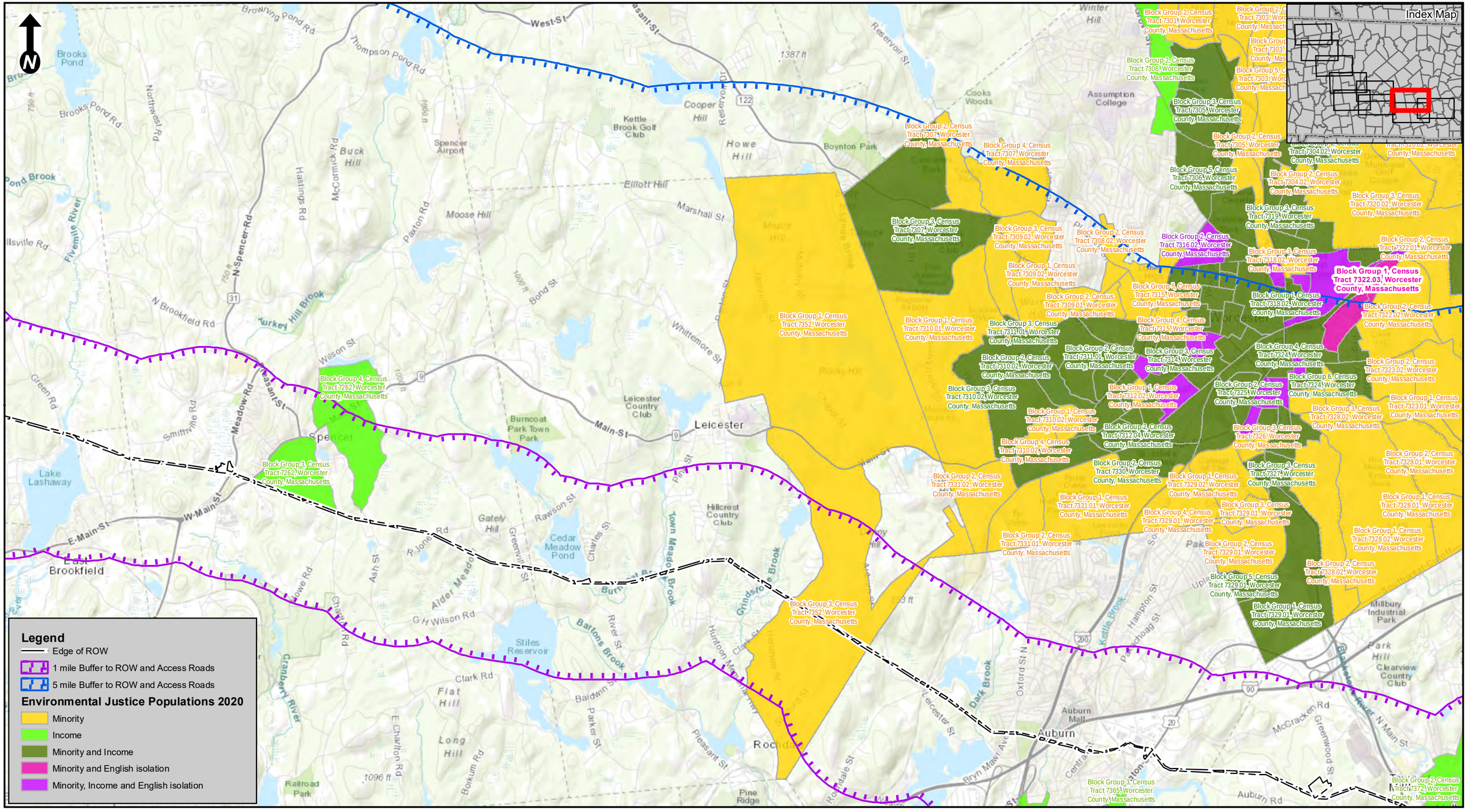

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT
Environmental Justice Populations Site Location Map
North Brookfield, East Brookfield, Spencer, Leicester, Auburn & Millbury, MA

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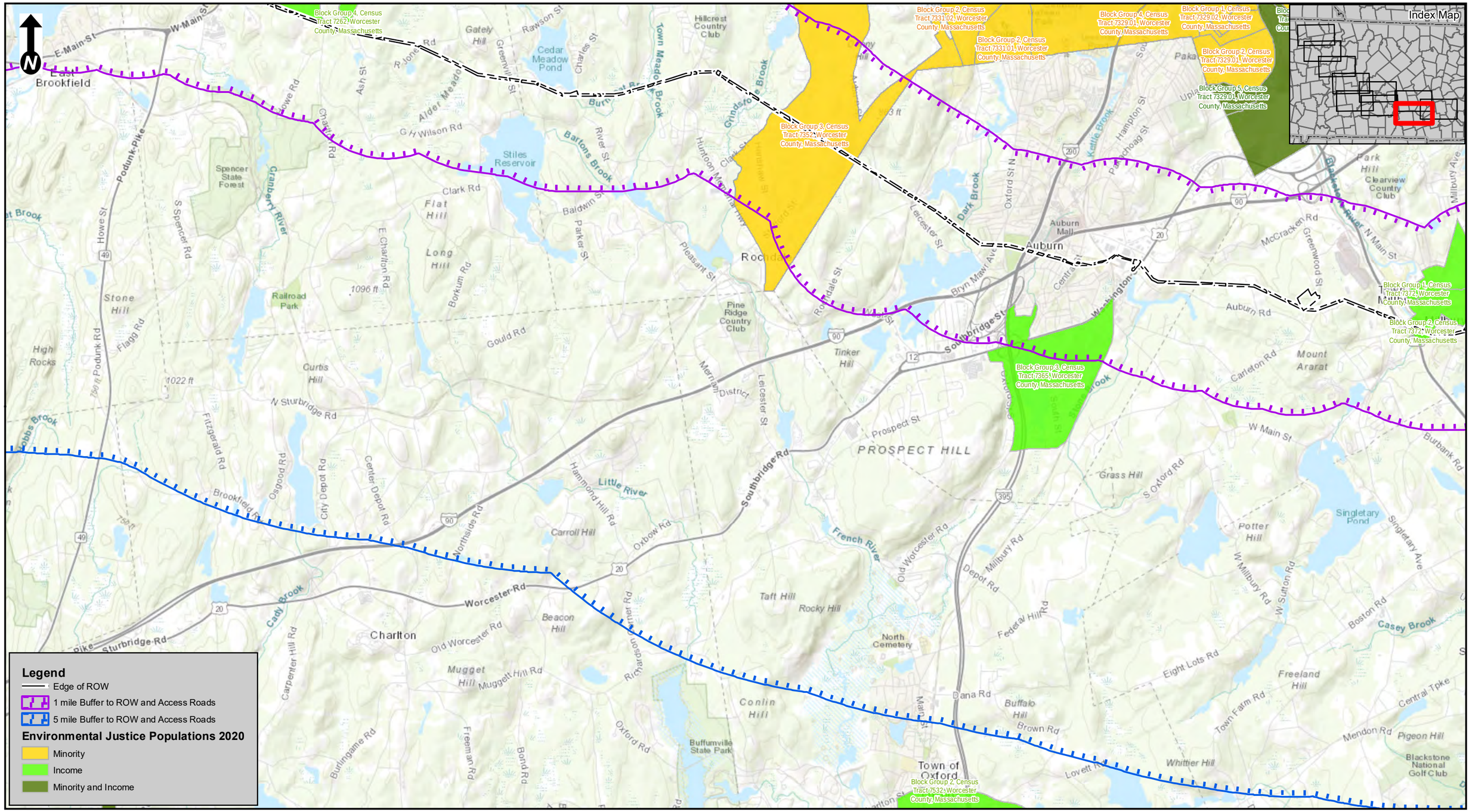

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT
Environmental Justice Populations Site Location Map
Spencer, Leicester, Auburn & Millbury, MA
Page 9 of 10

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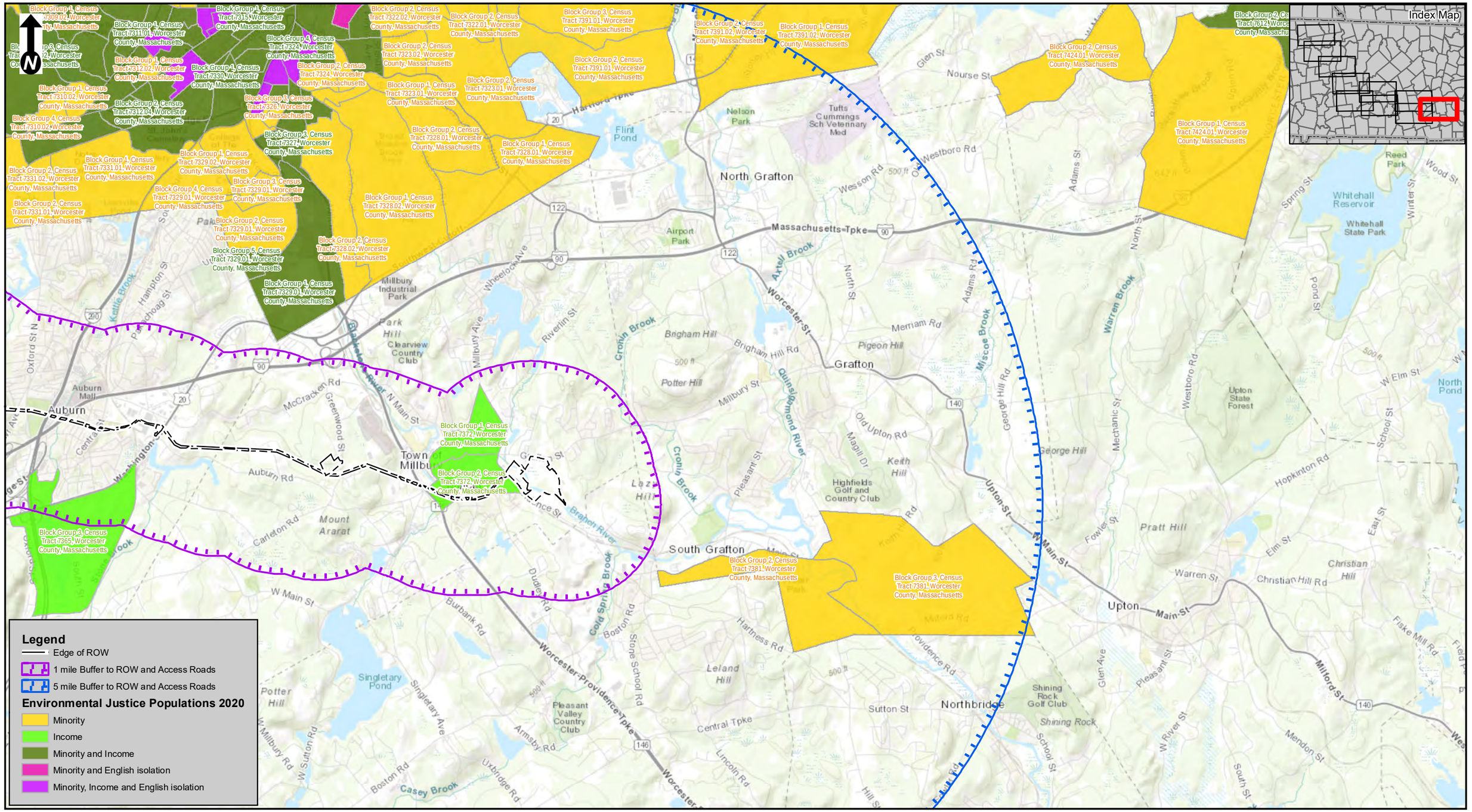

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CENTRAL TO WESTERN MASSACHUSETTS ENERGY IMPROVEMENT PROJECT
Environmental Justice Populations Site Location Map
Auburn & Millbury, MA
Page 10 of 10

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Appendix D – Environmental Justice Screening Form

Environmental Justice Screening Form

Project Name	Central to Western MA Energy Improvement Project
Anticipated Date of MEPA Filing	January 15, 2025
Proponent Name	New England Power Company
Contact Information (e.g., consultant)	Priyanka Shrestha, BSC Group Inc. 1 Mercantile Street Suite 610 Worcester, MA 01608 (617) 896-4570 Project email: CWMA-EIP@bscgroup.com
Public website for project or other physical location where project materials can be obtained (if available)	https://cmatowmaenergy.com/
Municipality and Zip Code for Project (if known)	Shelburne (01370), Conway (01341), Deerfield (01342), Sunderland (01375), Leverett (01054), Shutesbury (01072), Pelham (01002), Belchertown (01007), Ware (01082), West Brookfield (01585), North Brookfield (01535), East Brookfield (01515), Spencer (01562), Leicester (01524), Auburn (01501), Millbury (01527)
Project Type* (list all that apply)	Rebuild New England Power Company's Existing E5/F6 Overhead Electric Transmission Line
Is the project site within a mapped 100-year FEMA flood plain? Y/N/ unknown	Yes, in short segments of the right-of-way scattered along the project length.
Estimated GHG emissions of conditioned spaces (click here for GHG Estimation tool)	Not applicable – No buildings are proposed as part of this Project.

Project Description

1. Provide a brief project description, including overall size of the project site and square footage of proposed buildings and structures if known.

   New England Power Company owns and operates the E5 and F6 electric transmission lines and associated tap lines located within existing maintained right-of-ways. The mainline right-of-way begins at New England Power Company's Millbury #305 Substation in Millbury, MA and ends at the Shelburne #4 Switchyard located in Shelburne, MA. The E5 and F6 transmission lines are operated at 69 kilovolts. These E5 and F6 Lines were put into service in the early 1900s, and portions of the E5/F6 Lines were refurbished in 2001.

   The wires are supported primarily by the original steel lattice structures installed in the early 1900s. The E5 and F6 "mainline" Lines cross approximately 67 miles within the following municipalities: Shelburne, Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and Millbury.

In addition to the mainline, there are also seven (7) tap lines[1] that are part of the Project. Five (5) of the tap lines, Shutesbury Tap (E5D/F6D), Lashaway Substation Tap (E5E/F6E), Harrington Switch Yard Tap (E5/F6), Leicester Substation Tap (E5E/F6E), and Pondville Substation Tap (E5E/F6E) are short tap lines with the tap structures and lines not extending outside of the mainline corridor. The Quabbin Switching Tap (E5W/F6W) and the Deerfield #3 Tap extend away from the mainline. The Quabbin Switching Tap is approximately 0.08 miles in length and the Deerfield #3 Tap is approximately 0.54 miles in length. Please refer to **Figure 1-1**.

Recent analyses and studies demonstrate that these century-old transmission lines are increasingly unreliable. As a result, New England Power Company is proposing to rebuild the E5 and F6 Lines and tap lines on new structures. The purpose is to ensure that New England Power Company provides reliable and continuous electricity to its customers serviced by these lines within Worcester, Hampden, Hampshire, and Franklin Counties. Although the new lines will continue to transmit electricity at 69 kilovolts, New England Power Company has planned and designed the Project to support transmission of a higher voltage since it is anticipated that New England Power Company will eventually need to be able to operate the lines at 115 kilovolts to support higher volumes of electricity usage and future renewable energy resources in this region. New England Power Company will also be installing Optical Primary Ground Wire, which serves a dual purpose by providing the necessary electrical grounding in the event of lightning strikes with the additional feature of enabling telecommunication along the lines and between substations. This telecommunication is critical to identifying problems, such as damage to the infrastructure from storm events or storm related outages, enabling New England Power Company to respond quickly to any problems with the transmission of electricity along these lines. In addition, due to poor access along most of the right-of-way, access improvements or re-establishment of existing and construction of new access will be undertaken to conduct the proposed work and support future maintenance of the lines.

2. List anticipated MEPA review thresholds (301 CMR 11.03) (if known)

ENF Review:

- 301 CMR 11.03(3)(b)(1)(b)-Wetlands, Waterways and Tidelands: alteration of 500 or more linear feet of bank along a fish run or inland bank.
- 301 CMR 11.03(3)(b)(1)(f)- Wetlands, Waterways and Tidelands: alteration of ½ or more acres of any other wetlands.
- 301 CMR 11.03(2)(b)(2)- State-listed species: taking of an endangered or threatened species or species of special concern, provided that the Project site is two or more acres and includes an area mapped as designated priority habitat. (Potential).

ENF and Mandatory EIR:

- 301 CMR 11.03(1)(a) - Land: Direct alteration of 50 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar.
- 301 CMR 11.03(3)(a)(1)(a) - Wetlands, Waterways and Tidelands: alteration of one or more acres of bordering vegetated wetlands (BVW).
- 301 CMR 11.03(3)(a)(1)(b) - Wetlands, Waterways and Tidelands: alteration of ten or more acres of any other wetlands.
- 301 CMR 11.06(7)(b) - Environmental Justice (EJ): The Secretary shall require an EIR for any Project that is located within a Designated Geographic Area around an EJ Population.

[1] Tap Lines, in terms of utility infrastructure, refer to transmission lines that serve as a connection between a primary utility transmission line (i.e., the mainline) and a substation facility.

3. List all anticipated state, local and federal permits needed for the project (if known)

Agency	Permit, Review, or Approval
Federal	
U.S. Army Corps of Engineers ("USACE")	Section 404 General Permit (Pre-Construction Notice) and consultations under Section 106 of National Historic Preservation Act and Section 7 of the Endangered Species Act
United States Environmental Protection Agency ("EPA")	National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges and Construction Dewatering Activities/Stormwater Pollution Prevention Plan (SWPPP)
State	
Executive Office of Energy and Environmental Affairs ("EEA")	MEPA Review/Certificate of the Secretary
Massachusetts Department of Environmental Protection ("MassDEP")	Section 401 Individual Water Quality Certificate; WQC Variance
Massachusetts Natural Heritage and Endangered Species Program ("NHESP")	Massachusetts Endangered Species Act – Determination of Take or No Take; Conservation Permit (if needed)
Massachusetts Historical Commission ("MHC")	Consultation under M.G.L. c. 9 in accordance with 950 CMR 70-71
Energy Facilities Siting Board ("EFSB")	G.L. c. 164, §69J Petition for Approval to Construct Transmission Lines
Department of Conservation and Recreation ("DCR")	Construction Access Permit
DCR, Division of Water Supply Protection	Watershed Protection Act Determination of Applicability
Massachusetts Department of Transportation ("MassDOT")	Permit to Access State Highway/Non-Municipal Utility Permits for crossing over of state roads with utility lines
Local	
Conservation Commissions in Shelburne, Conway, Deerfield, Sunderland, Leverett, Shutesbury, Pelham, Belchertown, Ware, West Brookfield, North Brookfield, East Brookfield, Spencer, Leicester, Auburn, and Millbury.	Order of Conditions per the Massachusetts Wetlands Protection Act (MA WPA)

4. Identify EJ populations and characteristics (Minority, Income, English Isolation) within 5 miles of project site (can attach map identifying 5-mile radius from EJ Maps Viewer in lieu of narrative)

See Attachment A.

5. Identify any municipality or census tract meeting the definition of "vulnerable health EJ criteria" in the DPH EJ Tool located in whole or in part within a 1 mile radius of the project site

The Towns of Millbury (heart attack), Shelburne (heart attack and elevated blood lead), Sunderland (elevated blood lead and low birth weight), and West Brookfield (heart attack) met Vulnerable Health EJ Criteria definitions. Six and five census tracts met the elevated blood lead and low birth weight Vulnerable Health EJ Criteria definitions, respectively. **See Attachment B.**

6. Identify potential short-term and long-term environmental and public health impacts that may affect EJ Populations and any anticipated mitigation.

Out of 19 EJ Populations within the 1-mile radius of the right-of-ways, only four (4) of the EJ Populations overlap with the right-of-ways or are within proximity to the right-of-ways. These EJ Populations are in the municipalities of Shelburne, Sunderland, Leicester, and Millbury. The right-of-ways pass through or are adjacent to one (1) population in Shelburne, one (1) population in Sunderland, one (1) in Leicester, and one (1) in Millbury. Out of the 67 miles of right-of-way, 4.6 right-of-way miles are within an EJ Census Tract.

Municipality	Census Tract
Shelburne	Block Group 4, Census Tract 415.02
Sunderland	Block Group 4, Census Tract 408
Leicester	Block Group 3, Census Tract 7352
Millbury	Block Group 2, Census Tract 7372

Potential environmental and public health impacts of the Project and anticipated mitigation include the following:

Air Quality
Construction-period activities, such as grading, road building, vehicle travel, and other earth-disturbing work may result in a temporary increase in airborne dust. Impacts to air quality will be minimized by adopting practices to control dust such as spreading wood mulch or straw and using water trucks to spray dried soil to prevent dust. The potential for dust generation is only anticipated during the construction period and is not anticipated to cause impacts to public health. Post construction, soil will be stabilized and re-vegetated.

In addition, diesel-powered equipment is required to use ultra-low sulfur diesel fuel. Any diesel-powered non-road construction equipment rated 50-horsepower or more that will be used on the Project for 30 days or more will be required to install emission control devices. The impacts from these emissions will be minimal and are not anticipated to cause impacts to public health.

Water Quality
The project will incorporate protective and preventative measures to minimize and avoid impacts to water quality. The right-of-ways cross wetland areas, streams, and rivers. To protect water quality and these sensitive areas, temporary access will be constructed using protective construction mats. Construction mats are comprised of wooden beams, bolted together, and are typically 4 feet wide by 16 feet long. They are laid temporarily on top of the ground and vegetation. Use of these mats is a "Best Management Practice" because they reduce environmental impacts by allowing heavy machines and vehicles to cross sensitive areas without damaging the soil or roots of vegetation and are also placed in a manner that does not affect the flow of water in streams. These mats will be removed when construction is completed, and the wetlands will be restored. Additional Best Management Practices, such as the use of straw wattles, silt fencing, stormwater management features, and other control measures will be used to prevent soil and other material from being transported into wetlands and streams. Using these Best Management Practices, any impacts to water quality will be negligible and temporary and are not anticipated to cause impacts to public health.

Land Protection and Open Space
There are three EJ Populations within Municipal Open Space within the Project right-of-ways. These

populations include - Block Group 4, Census Tract 415.02 in Shelburne, Block Group 4, Census Tract 408 in Sunderland, and Block Group 3, Census Tract 7262 in Spencer across the Franklin and Worcester County, Massachusetts. Block Group 4, Census Tract 408 is located within four (4) separate parcels named Mt. Toby Wildlife Management Area owned by Department of Fish and Game, and one parcel named Patterson Donald F Jr APR owned by Patterson Donald F Jr and Susan T. Additionally, Block Group 3, Census Tract 7262 in Spencer, Worcester County, Massachusetts is located within two Article 97 Lands: John O'Gara Park and Bixby Road CR, owned by Town of Spencer and South Middlesex Non-Profit Housing Corporation. Project activities within EJ Census Tracts Open Space parcels will be limited to the existing right-of-ways and historically used access.

The Project has been designed to utilize existing access within New England Power Company easements wherever feasible. However, improvements to existing access and construction of new access ways within existing easements will be required within some of these parcels (for instance, Mt. Toby Wildlife Management Area). The public's access to Protected Land and Open Space within EJ Populations will be temporarily impacted during construction.

New England Power Company will provide notification of the intended construction plan and schedule to any affected abutters so that the effect of any temporary disruptions may be minimized. To mitigate temporary construction-phase disturbances to public open spaces, specifically existing trail systems, New England Power Company will coordinate with the affected stakeholders and will develop an outreach plan to include safety signage and temporary detours around active construction zones. Normal operation at all facilities will continue and existing land uses will be allowed to continue following construction. None of these activities are anticipated to cause impacts to public health.

Noise

The EJ communities that are most likely to have temporary noise impacts are the communities that are directly within or are located near the right-of-ways. The EJ Populations that have relatively greater development are Block Group 2, Census Tract 7372 in Millbury; and Block Group 3, Census Track 7352, in Leicester, primarily along Stafford Street and Henshaw Street. Noise impacts associated with construction-period activities are temporary in nature and expected to be minimal. Where construction will occur adjacent to residences, New England Power Company will notify landowners prior to the commencement of work. Noise-generating activities will be conducted in accordance with any local and state requirements and are not anticipated to cause impacts to public health.

Traffic

Impacts to traffic during the construction of the project will be minor and intermittent. The work areas will be accessed primarily from New England Power Company-owned access routes or minor town roadways. Within Block Group 4, Census Tract 408 in Sunderland, temporary access off Route 47 (Montague Rd) will be required. Block Group 4, Census Tract 415.02, in Shelburne, temporary access off Route 2 (Mohawk Trail) will be required. New England Power Company will obtain the necessary permits from MassDOT for access. Once on-site, vehicle traffic will be limited to within or in proximity to the right-of-way. Since the right-of-way is an un-manned facility, there will be no permanent impacts to traffic patterns or use of existing roadways and no impacts to public health are anticipated from traffic.

7. Identify project benefits, including "Environmental Benefits" as defined in 301 CMR 11.02, that may improve environmental conditions or public health of the EJ population.

Potential "Environmental Benefits" include the following:

- Increased resiliency of the overall transmission line. By installing improved foundations and more robust structures, this infrastructure will be better suited to

withstand strong winds and storm events.

- The new overhead lines will have higher voltage capacity which will allow more electricity to flow during times of high usage, such as extreme heat events, which are anticipated to increase in frequency due to climate change.
- The installation of Optical Primary Ground Wire will allow better communication between substations, resulting in improved response time during storm-related emergencies and outages, which will increase public safety.

Other benefits of this project that are not expressly included under the definition of "Environmental Benefits" consist of the following:

- Reduce overall disturbance to adjacent landowners, wetland resource areas, and rare species habitat over time by planning for the future and reducing the likelihood of multiple repeat projects, thereby reducing environmental impacts, and reducing costs to New England Power Company's customers.
- The replacement of the lines will have the added benefit of allowing future renewable energy resources to connect into the system. Addressing the climate change crisis requires a major expansion of renewable energy and the infrastructure necessary to support and deliver that energy. New England Power Company is actively taking steps to ensure that its system is ready to meet this critical challenge. Replacing infrastructure like the E5 and F6 Lines helps to accomplish this goal. The replacement lines will have higher kilovolt ratings that will support higher volumes of electricity usage and interconnection of future renewable energy resources in this region. This longer-term view is supported by the initial results of the ISO-NE 2050 study, where an upgrade to 115 kilovolts is necessary based on the current study assumptions and long-term forecasts for the Commonwealth.

8. Describe how the community can request a meeting to discuss the project, and how the community can request oral language interpretation services at the meeting. Specify how to request other accommodations, including meetings after business hours and at locations near public transportation.

Communities and members of the public can access information related to the project in the following ways:

- A public website, hosted at the following web address: https://cmatowmaenergy.com/
- A virtual community meeting hosted by New England Power Company on December 19, 2024.
    - Recipients of this screening form will receive information related to this meeting via email.
    - Notification of this virtual meeting will be published in newspapers prior to the meeting.
- Hard copies of project materials will be made available to anyone on request.
- If you have additional questions, please contact 888-431-3536 or email us at info@cmatowmaenergy.com.

There are no EJ communities that meet the "English Isolation" criteria within 1-mile DGA of the Project ROW. However, should individuals request interpretation services in advance of meeting dates, including translation of project materials, please email info@cmatowmaenergy.com. NEP will

endeavor to translate the documents provided to EJ populations and provide requested interpretation.

Recipients of this form include organizations on the EJ Reference List provided by Massachusetts Executive Office of Energy and Environmental Affairs per the Public Involvement Protocol. In addition, notice of the virtual public meeting details will be sent to Town Administrators.

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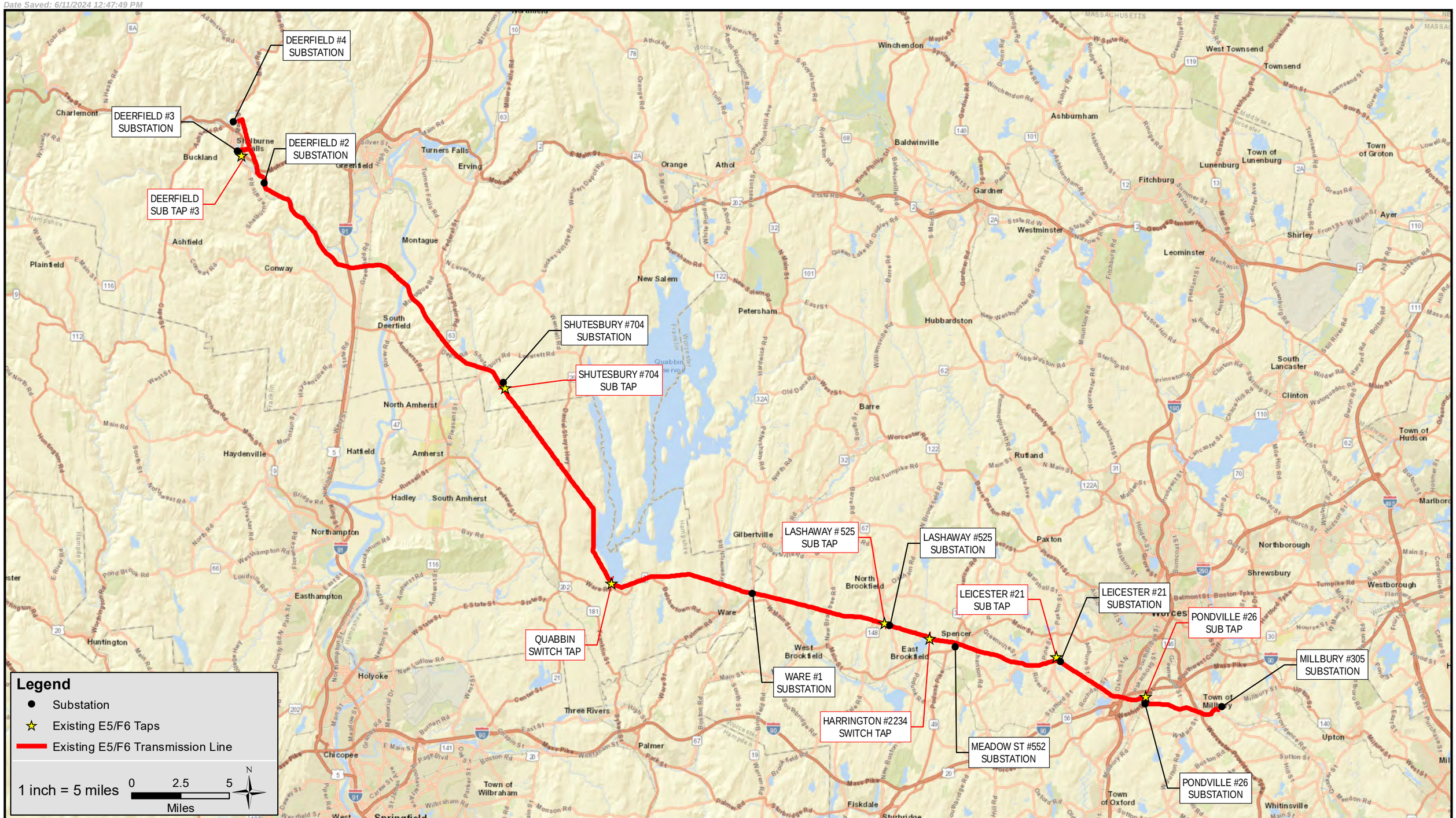

Central to Western MA Energy Improvement Project

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Figure 1-1
Overview of the Project Route

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Attachment A: Central to Western MA Energy Improvement Project
Environmental Justice (EJ) Communities within 5 Miles

Block Group	Census Tract	Municipality	EJ Criteria Met	Minority Population (%)	Median Income ($; % of MA Median Income)	English Isolation (%)
4	401	Charlemont	Income	9.65%	$53,229; 63.08%	0.00%
1	407.01	Montague	Income	18.44%	$40,491; 47.98%	0.00%
2	407.01	Montague	Income	23.09%	$25,339; 30.03%	1.46%
4	407.01	Montague	Income	15.73%	$54,696; 64.82%	0.00%
1	407.02	Montague	Income	6.89%	$40,000; 47.40%	1.85%
2	408	Sunderland	Income	23.12%	$47,614; 56.42%	5.73%
3	408	Sunderland	Minority	29.21%	$95,230; 112.85%	6.57%
4	408	Sunderland	Minority and income	24.84%	$41,845; 49.59%	2.31%
1	411	Greenfield	Income	8.70%	$52,315; 61.99%	2.39%
1	412	Greenfield	Income	12.99%	$54,432; 64.50%	0.00%
3	412	Greenfield	Income	12.10%	$51,435; 60.95%	5.34%
1	413.01	Greenfield	Income	21.40%	$40,204; 47.64%	3.85%
2	413.01	Greenfield	Income	20.44%	$44,091; 52.25%	4.15%
3	413.01	Greenfield	Income	17.50%	$43,472; 51.52%	0.00%
1	413.02	Greenfield	Income	14.54%	$21,792; 25.82%	0.00%
2	413.02	Greenfield	Income	15.76%	$41,146; 48.76%	2.49%
1	414	Greenfield	Minority and income	39.85%	$24,688; 29.26%	2.92%
2	414	Greenfield	Minority and income	24.84%	$47,404; 56.18%	9.00%
3	415.02	Buckland	Income	8.97%	$44,063; 52.22%	0.00%
4	415.02	Shelburne	Income	9.42%	$49,063; 58.14%	4.78%
2	7231	Hardwick	Income	12.27%	$39,205; 46.46%	0.00%
3	7241	West Brookfield	Income	10.81%	$36,913; 43.74%	0.00%
3	7251	North Brookfield	Income	11.85%	$51,053; 60.50%	0.00%
3	7262	Spencer	Income	20.78%	$37,448; 44.38%	0.00%
4	7262	Spencer	Income	17.34%	$28,977; 34.34%	0.00%
2	7307	Worcester	Minority	32.33%	$98,269; 116.45%	0.00%
3	7307	Worcester	Minority and income	34.15%	$44,099; 52.26%	0.00%
4	7307	Worcester	Minority	36.82%	$81,708; 96.83%	5.48%

Attachment A: Central to Western MA Energy Improvement Project
Environmental Justice (EJ) Communities within 5 Miles

Block Group	Census Tract	Municipality	EJ Criteria Met	Minority Population (%)	Median Income ($; % of MA Median Income)	English Isolation (%)
2	7308.02	Worcester	Minority	29.27%	$80,300; 95.16%	7.88%
2	7309.01	Worcester	Minority	28.93%	$69,306; 82.13%	15.55%
1	7309.02	Worcester	Minority	26.41%	$98,073; 116.22%	0.00%
2	7309.02	Worcester	Minority	35.89%	$0; 0%	11.92%
3	7309.02	Worcester	Minority	24.64%	$101,750; 120.58%	0.00%
1	7310.01	Worcester	Minority	48.87%	$75,882; 89.92%	8.72%
1	7310.02	Worcester	Minority	47.89%	$36,168; 42.86%	5.51%
2	7310.02	Worcester	Minority and income	57.88%	$41,745; 49.47%	10.13%
3	7310.02	Worcester	Minority and income	50.88%	$61,429; 72.80%	9.75%
4	7310.02	Worcester	Minority	60.54%	$62,321; 73.85%	7.56%
1	7311.01	Worcester	Minority and income	67.94%	$2,500; 2.96%	18.82%
2	7311.01	Worcester	Minority and income	62.12%	$54,609; 64.71%	4.60%
3	7311.01	Worcester	Minority and income	33.77%	$50,568; 59.93%	1.54%
4	7311.01	Worcester	Minority and income	66.34%	$40,847; 48.41%	11.22%
1	7311.02	Worcester	Minority	26.38%	$118,594; 140.54%	0.00%
2	7311.02	Worcester	Minority and income	50.68%	$46,964; 55.65%	9.61%
3	7311.02	Worcester	Minority	36.22%	$118,750; 140.72%	0.00%
1	7312.02	Worcester	Minority	27.56%	$0; 0%	0.00%
1	7312.03	Worcester	Minority and income	73.68%	$14,852; 17.60%	16.78%
2	7312.03	Worcester	Minority and income	59.47%	$32,567; 38.59%	5.56%
3	7312.03	Worcester	Minority, income and English isolation	67.40%	$39,276; 46.54%	29.44%
4	7312.03	Worcester	Minority and income	66.90%	$41,058; 48.66%	0.00%
1	7312.04	Worcester	Minority and income	73.27%	$44,784; 53.07%	10.56%
2	7312.04	Worcester	Minority and income	73.89%	$31,406; 37.22%	10.10%
1	7313	Worcester	Minority and income	80.81%	$16,719; 19.81%	12.10%

Attachment A: Central to Western MA Energy Improvement Project
Environmental Justice (EJ) Communities within 5 Miles

Block Group	Census Tract	Municipality	EJ Criteria Met	Minority Population (%)	Median Income ($; % of MA Median Income)	English Isolation (%)
2	7313	Worcester	Minority, income and English isolation	88.57%	$37,548; 44.50%	42.62%
3	7313	Worcester	Minority and income	78.02%	$38,333; 45.43%	19.32%
1	7314	Worcester	Minority, income and English isolation	84.86%	$14,744; 17.47%	25.50%
2	7314	Worcester	Minority, income and English isolation	79.14%	$22,778; 26.99%	30.74%
3	7314	Worcester	Minority and income	74.83%	$67,778; 80.32%	17.23%
4	7314	Worcester	Minority and income	85.42%	$46,908; 55.59%	0.00%
5	7314	Worcester	Minority and income	77.71%	$27,981; 33.16%	0.00%
1	7315	Worcester	Minority and income	84.27%	$16,319; 19.34%	19.41%
2	7315	Worcester	Minority and income	68.93%	$14,179; 16.80%	18.15%
3	7315	Worcester	Minority and income	79.90%	$39,240; 46.50%	4.15%
4	7315	Worcester	Minority	84.90%	$0; 0%	9.87%
5	7315	Worcester	Minority	62.56%	$0; 0%	14.94%
1	7316.01	Worcester	Minority and income	48.36%	$17,012; 20.16%	9.90%
2	7316.01	Worcester	Minority and income	65.81%	$41,481; 48.32%	7.13%
3	7316.01	Worcester	Minority and income	48.08%	$40,984; 48.57%	23.25%
4	7316.01	Worcester	Minority and income	35.10%	$25,772; 30.02%	0.00%
2	7316.02	Worcester	Minority, income and English isolation	34.35%	$25,921; 30.72%	25.20%
1	7317	Worcester	Minority and income	49.39%	$32,813; 38.88%	20.81%
2	7317	Worcester	Minority and income	46.12%	$34,856; 41.31%	11.59%
3	7317	Worcester	Minority and income	61.01%	$40,993; 48.58%	9.09%
2	7318.01	Worcester	Minority, income and English isolation	50.43%	$15,176; 17.98%	29.20%
1	7318.02	Worcester	Minority and income	60.91%	$43,583; 51.65%	23.23%
2	7318.02	Worcester	Minority, income and English isolation	91.93%	$11,543; 13.68%	33.93%

Attachment A: Central to Western MA Energy Improvement Project
Environmental Justice (EJ) Communities within 5 Miles

Block Group	Census Tract	Municipality	EJ Criteria Met	Minority Population (%)	Median Income ($; % of MA Median Income)	English Isolation (%)
4	7318.02	Worcester	Minority, income and English isolation	69.17%	$33,203; 39.35%	51.15%
2	7322.01	Worcester	Minority	47.57%	$76,250; 90.36%	12.18%
1	7322.02	Worcester	Minority and income	41.89%	$51,163; 60.63%	23.46%
2	7322.02	Worcester	Minority	38.89%	$92,344; 109.43%	9.14%
1	7322.03	Worcester	Minority and English isolation	56.73%	$75,401; 89.35%	25.93%
2	7322.03	Worcester	Minority and English isolation	51.76%	$68,902; 81.65%	33.42%
3	7322.03	Worcester	Minority and income	68.75%	$39,732; 47.08%	14.59%
1	7323.01	Worcester	Minority	42.72%	$61,607; 73.01%	4.59%
2	7323.01	Worcester	Minority	35.12%	$68,795; 81.53%	4.69%
1	7323.02	Worcester	Minority and income	56.12%	$39,207; 46.46%	14.81%
2	7323.02	Worcester	Minority	46.02%	$77,561; 91.91%	21.75%
1	7324	Worcester	Minority	64.55%	$60,851; 72.11%	4.26%
2	7324	Worcester	Minority	64.66%	$66,250; 78.51%	14.15%
3	7324	Worcester	Minority, income and English isolation	76.26%	$37,964; 44.99%	29.15%
4	7324	Worcester	Minority and income	75.66%	$52,621; 62.36%	14.81%
5	7324	Worcester	Minority, income and English isolation	82.52%	$31,406; 37.22%	34.55%
6	7324	Worcester	Minority and income	72.98%	$35,217; 41.73%	8.70%
1	7325	Worcester	Minority and income	60.39%	$29,886; 35.42%	8.70%
2	7325	Worcester	Minority and income	75.32%	$32,845; 38.92% of the MA median	10.95%
1	7326	Worcester	Minority, income and English isolation	72.92%	$22,578; 26.76%	33.49%
2	7326	Worcester	Minority and income	71.43%	$37,500; 44.44%	19.14%
3	7326	Worcester	Minority	60.70%	$74,018; 87.71%	0.00%
4	7326	Worcester	Minority	64.07%	$118,250; 140.13%	2.59%
5	7326	Worcester	Minority, income and English isolation	71.92%	$37,839; 44.84%	43.53%

Attachment A: Central to Western MA Energy Improvement Project
Environmental Justice (EJ) Communities within 5 Miles

Block Group	Census Tract	Municipality	EJ Criteria Met	Minority Population (%)	Median Income ($; % of MA Median Income)	English Isolation (%)
1	7327	Worcester	Minority and income	60.84%	$24,044; 28.49%	14.81%
2	7327	Worcester	Minority and income	68.38%	$53,750; 63.70%	2.99%
3	7327	Worcester	Minority and income	67.99%	$47,788; 56.63%	9.39%
4	7327	Worcester	Minority and income	67.45%	$28,997; 34.36%	0.00%
1	7328.01	Worcester	Minority	32.93%	$77,821; 92.22%	1.71%
2	7328.01	Worcester	Minority	42.81%	$70,766; 83.86%	5.39%
1	7328.02	Worcester	Minority	41.79%	$63,676; 75.46%	10.36%
2	7328.02	Worcester	Minority	57.39%	$73,250; 86.80%	8.68%
3	7328.02	Worcester	Minority	64.55%	$0; 0%	13.11%
1	7329.01	Worcester	Minority and income	51.36%	$32,768; 38.83%	8.83%
2	7329.01	Worcester	Minority	51.76%	$63,737; 75.53%	7.60%
3	7329.01	Worcester	Minority	54.48%	$71,458; 84.68%	14.74%
4	7329.01	Worcester	Minority	39.48%	$64,798; 76.79%	5.44%
5	7329.01	Worcester	Minority and income	59.02%	$12,080; 14.32%	17.66%
1	7329.02	Worcester	Minority	31.10%	$0; 0%	0.00%
1	7330	Worcester	Minority and income	77.87%	$41,667; 49.38%	0.00%
2	7330	Worcester	Minority and income	64.70%	$41,369; 49.02%	6.68%
3	7330	Worcester	Minority and income	81.18%	$33,799; 40.05%	14.54%
1	7331.01	Worcester	Minority	46.47%	$57,500; 68.14%	6.50%
2	7331.01	Worcester	Minority	37.34%	$66,369; 78.65%	0.00%
1	7331.02	Worcester	Minority and income	57.28%	$43,696; 51.78%	8.28%
2	7331.02	Worcester	Minority	41.94%	$74,712; 88.54%	7.60%
1	7352	Leicester	Minority	25.96%	$103,021; 122.08%	0.00%
3	7352	Leicester	Minority	26.48%	$97,821; 115.92%	0.00%
3	7365	Auburn	Income	10.13%	$44,773; 53.06%	0.00%
1	7372	Millbury	Income	16.65%	$53,875; 63.84%	0.00%
2	7372	Millbury	Income	13.73%	$53,375; 63.25%	0.00%
2	7381	Grafton	Minority	27.96%	$67,273; 79.72%	0.00%

Attachment A: Central to Western MA Energy Improvement Project
Environmental Justice (EJ) Communities within 5 Miles

Block Group	Census Tract	Municipality	EJ Criteria Met	Minority Population (%)	Median Income ($; % of MA Median Income)	English Isolation (%)
3	7381	Grafton	Minority	35.79%	$127,619; 151.23%	0.00%
2	7391.01	Shrewsbury	Minority	32.05%	$72,425; 85.83%	0.00%
3	7391.01	Shrewsbury	Minority	44.44%	$131,200; 155.48%	2.82%
1	7391.02	Shrewsbury	Minority	57.23%	$148,523; 176.01%	0.00%
2	7391.02	Shrewsbury	Minority	58.24%	$100,313; 118.88%	11.76%
1	7601	Brookfield	Income	7.40%	$34,779; 41.21%	0.00%
1	7611	Warren	Income	10.46%	$50,128; 59.40%	0.00%
3	7611	Warren	Income	12.83%	$48,711; 57.72%	0.00%
2	8102	Palmer	Income	10.22%	$47,163; 55.89%	2.29%
3	8201.01	Ware	Income	13.88%	$41,731; 49.45%	0.00%
2	8201.02	Ware	Income	19.14%	$29,250; 34.66%	0.00%
3	8201.02	Ware	Minority and income	24.51%	$33,889; 40.16%	2.56%
1	8203	Amherst	Minority	28.51%	$118,250; 140.13%	1.60%
2	8203	Amherst	Minority and income	51.39%	$37,500; 44.44%	5.65%
3	8203	Amherst	Minority	58.45%	$67,778; 80.32%	3.88%
4	8203	Amherst	Minority	33.43%	$75,882; 89.92%	3.83%
5	8203	Amherst	Minority	45.06%	$61,429; 72.80%	4.91%
1	8204	Amherst	Minority and income	39.52%	$2,500; 2.96%	0.00%
1	8205	Amherst	Minority and income	28.86%	$54,609; 64.71%	0.00%
2	8205	Amherst	Minority	24.75%	$106,190; 125.84%	4.96%
3	8205	Amherst	Minority and income	36.89%	$22,936; 27.18%	0.00%
4	8205	Amherst	Minority and income	25.91%	$16,226; 19.23%	0.00%
5	8205	Amherst	Minority	30.69%	$74,018; 87.71%	1.21%
6	8205	Amherst	Minority and income	41.89%	$40,956; 48.53%	2.29%
1	8206	Amherst	Minority	52.41%	$0; 0%	0.00%
1	8207	Amherst	Minority and income	44.46%	$36,168; 42.86%	2.75%
2	8207	Amherst	Minority	40.03%	$62,321; 73.85%	9.09%
3	8207	Amherst	Minority	27.74%	$140,000; 165.91%	3.64%

Attachment A: Central to Western MA Energy Improvement Project
Environmental Justice (EJ) Communities within 5 Miles

Block Group	**Census Tract**	**Municipality**	**EJ Criteria Met**	**Minority Population** (%)	**Median Income** ($; % of MA Median Income)	**English Isolation** (%)
3	8208.01	Amherst	Minority and income	60.34%	$47,435; 56.21%	5.64%
4	8208.01	Amherst	Minority	40.49%	$89,712; 106.31%	14.69%

Attachment B: Central to Western MA Energy Improvement Project
MA Department of Public Health (DPH) Environmental Justice (EJ) Tool Vulnerable Health EJ Criteria

Vulnerable Health Environmental Justice (EJ) by Community within the Designated Geographic Area (DGA) of 1 Mile

Municipality	Vulnerable Health Criteria Met (Yes/No)			
	Heart Attack	Elevated Blood Lead	Low Birth Weight	Childhood Asthma
Auburn	No	No	No	No
Belchertown	No	No	No	No
Conway	No	No	No	No
Deerfield	No	No	No	No
Leicester	No	No	No	No
Leverett	No	No	No	No
Millbury	**Yes**	No	No	No
North Brookfield	No	No	No	No
Pelham	No	No	No	No
Shelburne	**Yes**	**Yes**	No	No
Shutesbury	No	No	No	No
Spencer	No	No	No	No
Sunderland	No	**Yes**	**Yes**	No
Ware	No	No	No	No
West Brookfield	**Yes**	No	No	No
Auburn	No	No	No	No
Belchertown	No	No	No	No
Conway	No	No	No	No
Deerfield	No	No	No	No

Source: MA Department of Public Health (DPH) Environmental Justice (EJ) Tool, 2017 - 2021 data.

Attachment B: Central to Western MA Energy Improvement Project
MA Department of Public Health (DPH) Environmental Justice (EJ) Tool Vulnerable Health EJ Criteria

Vulnerable Health Environmental Justice (EJ) by Census Tract within the Designated Geographic Area (DGA) of 1 Mile

Census Tract	Environmental Justice (EJ) Population Present	Elevated Blood Lead		Low Birth Weight	
		Rate Prevalence	Criteria Met	Rate Prevalence	Criteria Met
406	No	24.1	**Yes**	NA	NA
407.02	No	22.1	**Yes**	NA	NA
408	Yes	NA	NA	368.1	**Yes**
415.01	No	70.4	**Yes**	NA	NA
415.02	Yes	NA	NA	0	No
7231	Yes	56.4	**Yes**	0	No
7251	Yes	35.2	**Yes**	452.3	**Yes**
7261	No	NA	NA	255.3	**Yes**
7262	Yes	14.1	No	NA	NA
7373	No	NA	NA	260.2	**Yes**
7511.01	No	0	No	NA	NA
7591	No	0	No	NA	NA
8201.01	No	14.6	No	NA	NA
8201.02	Yes	95.6	**Yes**	327.9	**Yes**
8202.04	No	NA	NA	217.4	No

Source: MA Department of Public Health (DPH) Environmental Justice (EJ) Tool, 2017 - 2021 data.

Notes: The criteria is met if the rate prevalence exceeds 110% of statewide value, which is 15 for elevated blood lead and 238.5 for low birth weight.

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Appendix D – Environmental Justice
EJ Reference List

Environmental Justice (EJ) Reference List

First Name	Last Name	Title	Phone	Email	Affiliation
Heather	Clish	Director of Conservation & Recreation Policy	(617) 523-0655	hclish@outdoors.org	Appalachian Mountain Club
Kerry	Bowie	Board President	Not Provided	kerry@msaadapartners.com	Browning the GreenSpace
Alma	Gordon	President	Not Provided	tribalcouncil@chappaquiddickwampanoag.org	Chappaquiddick Tribe of the Wampanoag Nation
Patricia	D. Rocker	Council Chair	Not Provided	rockerpatriciad@verizon.net	Chappaquiddick Tribe of the Wampanoag Nation, Whale Clan
Cindy	Luppi	New England Director	(617) 338-8131 x208	cluppi@cleanwater.org	Clean Water Action
Sylvia	Broude	Executive Director	(617) 292-4821	sylvia@communityactionworks.org	Community Action Works
Ryan	Odonnell	Water Quality Monitoring Coordinator	Not Provided	rodonnell@ctriver.org	Connecticut River Conservancy
Ryan	Odonnell	Water Quality Monitoring Coordinator	Not Provided	rodonnell@ctriver.org	Connecticut River Conservancy
Johannes	Epke	Staff Attorney	(617) 850-1761	jepke@clf.org	Conservation Law Foundation
Britteny	Jenkins	Vice President		Bjenkins@clf.org	Conservation Law Foundation
Ben	Hellerstein	MA State Director	(617) 747-4368	ben@environmentmassachusetts.org	Environment Massachusetts
Amy	Boyd Rabin	Vice President of Policy	(617) 221-8258	aboydrabin@environmentalleague.org	Environmental League of Massachusetts
Zahra	Saifee	Policy & Advocacy Coordinator	(435) 632-9482	zsaifee@environmentalleague.org	Environmental League of Massachusetts
Melissa	Ferretti	Chair	(508) 304-5023	melissa@herringpondtribe.org	Herring Pond Wampanoag Tribe

Mark	Wamsley	Conservation Director	Not Provided	mark@kestreltrust.org	Kestrel Land Trust
Brian	Weeden	Chair	(774) 413-0520	Brian.Weeden@mwtribe-nsn.gov	Mashpee Wampanoag Tribe
David	Weeden	THPO/Director	(774) 327.0068	David.Weeden@mwtribe-nsn.gov	Mashpee Wampanoag Tribe
Nakia	Hendricks Jr.	Office Manager	Not Provided	106Review@mwtribe-nsn.gov	Mashpee Wampanoag Tribe
Heidi	Ricci	Director of Policy	Not Provided	hricci@massaudubon.org	Mass Audubon
Robb	Johnson	Executive Director	(978) 443-2233	robb@massland.org	Mass Land Trust Coalition
Julia	Blatt	Executive Director	(617) 714-4272	juliablatt@massriversalliance.org	Mass Rivers Alliance
John	Peters, Jr.	Executive Director	(617) 573-1292	john.peters@mass.gov	Massachusetts Commission on Indian Affairs (MCIA)
Elizabeth	Solomon	Not Provided	Not Provided	Solomon.Elizabeth@gmail.com	Massachusetts Tribe at Ponkapoag
Lena Miles	Entin Gresham	Interim Co-Directors	Not Provided	Lena@N2NMa.org Miles@N2NMa.org	Neighbor to Neighbor Mass.
Cheryll	Toney Holley	Chair	(774) 317-9138	crwritings@aol.com	Nipmuc Nation (Hassanamisco Nipmucs)
Raquel	Halsey	Executive Director	(617) 232-0343	rhalsey@naicob.org	North American Indian Center of Boston
Rob	Moir	Executive Director	Not Provided	rob@oceanriver.org	Ocean River Institute
Cora	Pierce	Not Provided	Not Provided	Coradot@yahoo.com	Pocassett Wampanoag Tribe
Sarita	Hudson	Director Programs & Development	(413) 794-7739	shudson@publichealthwm.org	Public Health Institute of Western Mass
Sarita	Hudson	Director Programs & Development	(413) 794-7739	shudson@publichealthwm.org	Public Health Institute of Western Mass
Vickash	Mohanka	Director, MA Chapter	Not Provided	vick.mohanka@sierraclub.org	Sierra Club MA

Stockbridge-Munsee Tribe		Historic Preservation Manager	(413) 884-6048	THPO@Mohican-nsn.gov	Stockbridge-Munsee Tribe
Jodi	Valenta	Massachusetts State Director	(617) 367-6200	Jodi.Valenta@tpl.org	The Trust for Public Land
Claire	B.W. Muller	Movement Building Director	(508) 308-9261	claire@uumassaction.org	Unitarian Universalist Mass Action Network
Bettina	Washington	Tribal Historic Preservation Officer	(508) 560-9014	thpo@wampanoagtribe-nsn.gov	Wampanoag Tribe of Gay Head (Aquinnah)

Appendix D – Environmental Justice Advance Notification Submittal

From:	Central to Western Mass Energy Improvement Project
Sent:	Tuesday, November 26, 2024 9:57 AM
To:	mepa@mass.gov; MEPA-EJ@mass.gov; claire@uumassaction.org; juliablatt@massriversalliance.org; Jodi.Valenta@tpl.org; kerry@msaadapartners.com; sylvia@communityactionworks.org; hclish@outdoors.org; jepke@clf.org; Bjenkins@clf.org; aboydrabin@environmentalleague.org; zsaifee@environmentalleague.org; ben@environmentmassachusetts.org; robb@massland.org; cluppi@cleanwater.org; Lena@N2NMa.org; Miles@N2NMa.org; rob@oceanriver.org; deb.pasternak@sierraclub.org; Heidi Ricci; tribalcouncil@chappaquiddickwampanoag.org; crwritings@aol.com; john.peters@mass.gov; melissa@herringpondtribe.org; rockerpatriciad@verizon.net; rhalsey@naicob.org; Coradot@yahoo.com; Solomon.Elizabeth@gmail.com; THPO@Mohican-nsn.gov; thpo@wampanoagtribe-nsn.gov; Brian.Weeden@mwtribe-nsn.gov; David.Weeden@mwtribe-nsn.gov; 106Review@mwtribe-nsn.gov; rodonnell@ctriver.org; shudson@publichealthwm.org; mark@kestreltrust.org; rodonnell@ctriver.org; shudson@publichealthwm.org
Cc:	Tyrrell, Michael; Theresa Portante; Priyanka Shrestha
Subject:	MEPA Advanced Notification – Central to Western Mass Energy Improvement Project
Attachments:	EJ Screening Form_Central to Western Mass Energy Improvement Project.pdf

Good morning,

On behalf of the New England Power Company (NEP), please find attached the Environmental Justice (EJ) Screening Form for NEP's Central to Western Mass Energy Improvement Project, located within an existing Right-of-Way within the Towns of Auburn, Belchertown, Conway, Deerfield, East Brookfield, Leicester, Leverett, Millbury, North Brookfield, Pelham, Shelburne, Shutesbury, Spencer, Sunderland, Ware, and West Brookfield. Recipients of this Form include organizations on the EJ Reference List provided by the Massachusetts Executive Office of Energy and Environmental Affairs per the *MEPA Public Involvement Protocol for EJ Populations*.

Best regards,
Central to Western MA Energy Improvement Project Team

Phone: +1 (888) 431-3536 [toll free]

Appendix D – Environmental Justice Invite to Meeting Submittal

From: Central to Western Mass Energy Improvement Project
Sent: Tuesday, December 17, 2024 4:54 PM
To: mepa@mass.gov; MEPA-EJ@mass.gov; claire@uumassaction.org; juliablatt@massriversalliance.org; Jodi.Valenta@tpl.org; kerry@msaadapartners.com; sylvia@communityactionworks.org; hclish@outdoors.org; jepke@clf.org; Bjenkins@clf.org; aboydrabin@environmentalleague.org; zsaifee@environmentalleague.org; ben@environmentmassachusetts.org; robb@massland.org; cluppi@cleanwater.org; Lena@N2NMa.org; Miles@N2NMa.org; rob@oceanriver.org; Heidi Ricci; tribalcouncil@chappaquiddickwampanoag.org; crwritings@aol.com; john.peters@mass.gov; melissa@herringpondtribe.org; rockerpatriciad@verizon.net; rhalsey@naicob.org; mailto:vick.mohanka@sierraclub.org; Coradot@yahoo.com; Solomon.Elizabeth@gmail.com; THPO@Mohican-nsn.gov; thpo@wampanoagtribe-nsn.gov; Brian.Weeden@mwtribe-nsn.gov; David.Weeden@mwtribe-nsn.gov; 106Review@mwtribe-nsn.gov; mark@kestreltrust.org; rodonnell@ctriver.org; shudson@publichealthwm.org; dalbertson@belchertown.org; townadmin@conwayma.gov; townadmin@town.deerfield.ma.us; townclerk@eastbrookfieldma.us; townadministrator@leverett.ma.us; townclerk@pelhamma.gov; townadmin@townofshelburne.gov; townadmin@shutesbury.org; sbeckley@townofware.com; rsangelo@wbrookfield.com; Boubacar.Dieme@nationalgrid.com; Brandie.Long@nationalgrid.com; Aubrey.OKeefe@nationalgrid.com; Nayanny.Bello-Paniagua@nationalgrid.com; jackdavey72@yahoo.com
Cc: Tyrrell, Michael; Joseph Carroll; Theresa Portante; Priyanka Shrestha
Subject: RE: Reminder of Virtual Community Meeting – Central to Western MA Energy Improvement Project

Good evening,

This is a reminder of the upcoming **Central to Western Mass Energy Improvement Project** virtual community meeting to provide Project information and engage the public, including Environmental Justice communities.

Please join us on **Thursday, December 19th, 2024**, from **6pm to 8pm** for a virtual community meeting to learn more about the Project, including an overview, timeline, activities, and anticipated schedule. This meeting will give our neighbors an opportunity to raise questions regarding the Project and the MEPA review process.

Zoom Meeting Link:
https://bscgroup.zoom.us/j/91360329005?pwd=2huFU0wZ5Wh1f9jmAxQ1Sz4PeE1J5a.1
Zoom Dial-in Number and Meeting ID: +1 (305) 224-1968, 91360329005

We look forward to seeing you!

Best regards,

Central to Western MA Energy Improvement Project Team

Phone: +1 (888) 431-3536 [toll free]

From: Central to Western Mass Energy Improvement Project
Sent: Wednesday, November 27, 2024 4:15 PM
To: mepa@mass.gov; MEPA-EJ@mass.gov; claire@uumassaction.org; juliablatt@massriversalliance.org; Jodi.Valenta@tpl.org; kerry@msaadapartners.com; sylvia@communityactionworks.org; hclish@outdoors.org; jepke@clf.org; Bjenkins@clf.org; aboydrabin@environmentalleague.org; zsaifee@environmentalleague.org; ben@environmentmassachusetts.org; robb@massland.org; cluppi@cleanwater.org; Lena@N2NMa.org; Miles@N2NMa.org; rob@oceanriver.org; hricci@massaudubon.org; tribalcouncil@chappaquiddickwampanoag.org; crwritings@aol.com; john.peters@mass.gov; melissa@herringpondtribe.org; rockerpatriciad@verizon.net; rhalsey@naicob.org; Coradot@yahoo.com; Solomon.Elizabeth@gmail.com; THPO@Mohican-nsn.gov; thpo@wampanoagtribe-nsn.gov; Brian.Weeden@mwtribe-nsn.gov; David.Weeden@mwtribe-nsn.gov; 106Review@mwtribe-nsn.gov; mark@kestreltrust.org; rodonnell@ctriver.org; shudson@publichealthwm.org; dalbertson@belchertown.org; townadmin@conwayma.gov; townadmin@town.deerfield.ma.us; townclerk@eastbrookfieldma.us; townadministrator@leverett.ma.us; townclerk@pelhamma.gov; townadmin@townofshelburne.gov; townadmin@shutesbury.org; sbeckley@townofware.com; rsangelo@wbrookfield.com; Boubacar.Dieme@nationalgrid.com; Brandie.Long@nationalgrid.com; Aubrey.OKeefe@nationalgrid.com; Nayanny.Bello-Paniagua@nationalgrid.com
Cc: Tyrrell, Michael <Michael.Tyrrell@nationalgrid.com>; Joseph Carroll <Joseph.Carroll1@nationalgrid.com>; Theresa Portante <TPortante@bscgroup.com>; Priyanka Shrestha <pshrestha@bscgroup.com>
Subject: Virtual Community Meeting – Central to Western MA Energy Improvement Project

Dear Neighbor,

The Massachusetts Environmental Protection Act (MEPA) review process provides opportunities for public review of a project's potential environmental impacts. New England Power Company (NEP) will host a virtual community meeting for the **Central to Western Mass Energy Improvement Project** to provide Project information and engage the public, including Environmental Justice communities.

Please join us on **Thursday, December 19th, 2024**, from **6pm to 8pm** for a virtual community meeting to learn more about the Project, including an overview, timeline, activities, and anticipated schedule. This meeting will give our neighbors an opportunity to raise questions regarding the Project and the MEPA review process.

Zoom Meeting Link:
https://bscgroup.zoom.us/j/91360329005?pwd=2huFU0wZ5Wh1f9jmAxQ1Sz4PeE1J5a.1
Zoom Dial-in Number and Meeting ID: +1 (305) 224-1968, 91360329005

NEP is committed to providing ample access and opportunity to stay up-to-date on this Project. More information can be found on the Project website: https://www.cmatowmaenergy.com/ or by calling the Project hotline number: **+1 (888) 431-3536** [toll free].

To request translation of the project materials or live interpretation during the meeting, please email info@CMAtoWMAenergy.com by Wednesday, December 11th. After the request has been made, a member of our outreach team will contact you.

Recipients of this meeting invitation include organizations on the EJ Reference List, provided by the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) per the *MEPA Public Involvement Protocol for EJ Populations*, and Municipality Administrators. We encourage organizations and municipalities to share this meeting invitation via websites, social media, or message boards. A public notice for the virtual community meeting will also be published in the following newspapers: the Worcester Telegram and Gazette (November 27th), the Greenfield Recorder (November 27th), and the Republican (November 29th).

We look forward to seeing you!

Best regards,
Central to Western MA Energy Improvement Project Team

Phone: +1 (888) 431-3536 [toll free]

Appendix D – Environmental Justice Legal Ad Submittal

Outlook

proof - PROJECT # 0100181.00-27.

From shunter@recorder.com <shunter@recorder.com>
Date Fri 11/22/2024 8:48 AM
To Julie Goldberg <JGoldberg@bscgroup.com>

3 attachments (104 KB)
4440935.pdf; relogo.jpg; shunter_4440935_1732283033353.png;

Hi Julie Attached is a proof of your notice to run in the Recorder on Wednesday November 27th. If that date works for you to publish, please approve by 11am on Monday. Suzanne

GREENFIELD RECORDER
Recorder.com
14 Hope Street
Greenfield, MA 01302
413-772-0261
Athol Daily News
Atholdailynews.com

Advertising Invoice

BSC GROUP
1 MERCANTILE ST # 610
WORCESTER, MA 01608

Cust#:17205
Ad#:4440935
Phone#:617-896-4500
Date:11/22/2024

Salesperson: Suzanne Hunter **Classification: Legals** **Ad Size: 2.0 x 4.000**

Advertisement Information:

Description	Start	Stop	Ins.	Cost/Day	Total
The Recorder	11/27/2024	11/27/2024	1	313.12	313.12

Payment Information:

Date:	Order#	Type
11/22/2024	4440935	BILLED ACCOUNT

Total Amount: 313.12

Tax: 0.00

Amount Due: 313.12

PROJECT # 0100181.00-27. - Thank you for your business!

Ad Copy

New England Power (NEP)
Central to Western Mass Energy Improvement Project
Virtual Community Meeting

NEP will host a virtual community meeting to provide Project information and engage the public on the Central to Western Mass Energy Improvement Project. Project information will include an overview, timeline, activities, and anticipated schedule. This meeting will give our neighbors an opportunity to raise questions regarding the Project and the Massachusetts Environmental Protection Act (MEPA) review process.

The Project will traverse through the Towns of Auburn, Belchertown, Conway, Deerfield, East Brookfield, Leicester, Leverett, Millbury, North Brookfield, Pelham, Shelburne, Shutesbury, Spencer, Sunderland, Ware, and West Brookfield.

Please join us on:
Thursday, December 19th, 2024 from 6pm to 8pm
Zoom Meeting Link: https://bscgroup.zoom.us/j/91360329005?pwd=2huFU0wZ5Whlf9jmAxQISz4PoEJJ5a.1
Zoom Dial-in Number and Meeting ID: +1 (305) 224-1968, 91360329005

NEP is committed to providing ample access and opportunity to stay up-to-date on this Project. More information can be found on the Project website: https://www.cmatowmaenergy.com/ or by calling the Project hotline number: **+1 (888) 431-3536** [toll free].

To request translation of the project materials or live interpretation during the meeting, please email info@CMAtoWMAenergy.com by Wednesday, December 11th. After the request has been made, a member of our outreach team will contact you.

November 27

4440935

Outlook

Thank you for placing your order with us.

From Worcester Legals <legalnotices@telegram.com>
Date Fri 11/22/2024 11:34 AM
To Deborah A. Horgan <dhorgan@bscgroup.com>; Julie Goldberg <JGoldberg@bscgroup.com>

1 attachment (15 KB)
LNEO01978440.pdf;

THANK YOU for your ad submission!

This is your confirmation that your order has been submitted. Below are the details of your transaction. Please save this confirmation for your records.

We appreciate you using our online self-service ads portal, available 24/7. Please continue to visit Worcester Telegram & Gazette's online Classifieds HERE to place your legal notices in the future.

Changes and/or cancellations may not be honored up to 2 business days prior to your first publication date.

Job Details

Order Number:	**LNEO0197844**
Classification:	Public Notices
Package:	General Package
Base amount:	$169.92
Service fee:	$6.78
Cash/Check/ACH	
Discount:	-$0.00
Total payment:	$176.70

As an incentive for customers, we provide a discount off the total order cost equal to the 3.99% service fee if you pay with Cash/Check/ACH. Pay by Cash/Check/ACH and save! In no event are service fees refundable.
Payment Type: visa

Account Details

Theresa Portante
207 Old Common Road
Lancaster, MA 01523
617-896-4346
jgoldberg@bscgroup.com
BSC Group
Credit Card - visa **********6673

Schedule for ad number LNEO01978440

Wed Nov 27, 2024
Worcester Telegram & Gazette *All Zones*

New England Power (NEP)
Central to Western Mass Energy Improvement Pro
Virtual Community Meeting

NEP will host a virtual community meeting to p
Project information and engage the public on the Cer
Western Mass Energy Improvement Project. Projec
mation will include an overview, timeline, activitie
anticipated schedule. This meeting will give our nei
an opportunity to raise questions regarding the Proje
the Massachusetts Environmental Protection Act (M
review process.

The Project will traverse the Towns of Auburn, Belche
Conway, Deerfield, East Brookfield, Leicester, Le
Millbury, North Brookfield, Pelham, Shelburne, Shute
Spencer, Sunderland, Ware, and West Brookfield.

Please join us on:
Thursday, December 19th, 2024 from 6pm to 8pm
Zoom Meeting Link: https://bscgroup.zoom.us/j/91360
pwd=2huFU0wZ5Wh1f9jmAxQ1Sz4PeE1J5a.1
Dial-in Number and Meeting ID: +1 (305) 224-19
91360329005

NEP is committed to providing ample access and opp
tunity to stay up-to-date on this Project. More inform
can be found on the Project website: https://www.cm
wmaenergy.com/ or by calling the Project hotline nur
+1 (888) 431-3536 [toll free].

To request translation of the project materials or live
interpretation during the meeting, please email info@
CMAtoWMAenergy.com by Wednesday, December 11
After the request has been made, a member of our ou
team will contact you.

Publication Dates
LNEO0197844

Outlook

Online Form Submittal: Contact Us - Town Manager Department

From noreply@civicplus.com <noreply@civicplus.com>
Date Wed 11/27/2024 4:29 PM
To Central to Western Mass Energy Improvement Project <CWMA-EIP@bscgroup.com>

Contact Us - Town Manager Department

Please complete the form below to submit your questions/comments. The Massachusetts Public Record Law states all electronic mail sent or received by the Town is considered a public record.

Your Name	Central to Western MA Energy Improvement Project Team
Your E-mail Address	CWMA-EIP@bscgroup.com
Subject	Virtual Community Meeting – Central to Western MA Energy Improvement Project
Message	Dear Neighbor, The Massachusetts Environmental Protection Act (MEPA) review process provides opportunities for public review of a project's potential environmental impacts. New England Power Company (NEP) will host a virtual community meeting for the Central to Western Mass Energy Improvement Project to provide Project information and engage the public, including Environmental Justice communities. Please join us on Thursday, December 19th, 2024, from 6pm to 8pm for a virtual community meeting to learn more about the Project, including an overview, timeline, activities, and anticipated schedule. This meeting will give our neighbors an opportunity to raise questions regarding the Project and the MEPA review process. Zoom Meeting Link: https://bscgroup.zoom.us/j/91360329005?pwd=2huFU0wZ5Wh1f9jmAxQ1Sz4PeE1J5a.1 Zoom Dial-in Number and Meeting ID: +1 (305) 224-1968, 91360329005 NEP is committed to providing ample access and opportunity to stay up-to-date on this Project. More information can be found

on the Project website: https://www.cmatowmaenergy.com/ or by calling the Project hotline number: +1 (888) 431-3536 [toll free].

To request translation of the project materials or live interpretation during the meeting, please email info@CMAtoWMAenergy.com by Wednesday, December 11th. After the request has been made, a member of our outreach team will contact you.

Recipients of this meeting invitation include organizations on the EJ Reference List, provided by the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) per the MEPA Public Involvement Protocol for EJ Populations, and Municipality Administrators. We encourage organizations and municipalities to share this meeting invitation via websites, social media, or message boards. A public notice for the virtual community meeting will also be published in the following newspapers: the Worcester Telegram and Gazette (November 27th), the Greenfield Recorder (November 27th), and the Republican (November 29th).

We look forward to seeing you!

Best regards,
Central to Western MA Energy Improvement Project Team

Phone: +1 (888) 431-3536 [toll free]

Attachment 1	*Field not completed.*
Attachment 2	*Field not completed.*
Attachment 3	*Field not completed.*

Appendix E – Agency Permits and Status

Environmental Notification Form (ENF)

Central To Western Massachusetts Energy Improvement Project

Anticipated Federal, State, and Municipal Agency Permit, Approval, and Status

Anticipated Federal, State, and Municipal Agency Permit, Approval, and Status

Agency	Permit/Review/Approval	Status/Coordination
U.S. Army Corps of Engineers ("USACE")	Section 404 General Permits Pre-Construction Notification ("PCN") Authorization and consultations under Section 106 of National Historic Preservation Act ("NHPA") and Section 7 of the Endangered Species Act ("ESA")	Target filing for October 2026
United States Environmental Protection Agency ("EPA")	National Pollutant Discharge Elimination System ("NPDES") General Permit for Stormwater Discharges and Construction Dewatering Activities/Stormwater Pollution Prevention Plan ("SWPPP").	To be filed at least 14 days prior to the start of construction.
State		
Executive Office of Energy and Environmental Affairs ("EEA")	MEPA Review – Secretary's Certificate	Target filing January 2025. A joint MEPA-EJ pre-filling meeting with MEPA was held on December 12th.
Massachusetts Department of Environmental Protection ("MassDEP")	Section 401 Individual Water Quality Certificate ("WQC") and Variance	Target filing April 2026.
Massachusetts Natural Heritage and Endangered Species Program ("NHESP")	Massachusetts Endangered Species Act ("MESA") – Determination of "take" or No "take"; Conservation & Management Permit (if needed)	MESA checklist target filing May 2025. Consultation within NHESP is ongoing.
Massachusetts Historical Commission ("MHC")	Consultation under General Laws of Massachusetts ("M.G.L.") c. 9 in accordance with 950 70-71	Consultation with MHC is ongoing.
Energy Facilities Siting Board ("EFSB")[1]	G.L. c. 164, §69J Petition for Approval to Construct Transmission Lines	Target filing January 2025.
Massachusetts Department of Public Utilities ("DPU")	G.L. c. 164, §72 Petition for Determination of Public Necessity and Convenience	Target filing January 2025.

[1] Concurrently with its Petition to the Siting Board, NEP intends to file Petitions with the Department of Public Utilities (DPU) in accordance with G.L. c. 164, § 72 and requesting exemptions from the Zoning Ordinances of the communities pursuant to G.L. c. 40A, § 3, other than those noted above.

Department of Conservation and Recreation ("DCR")	Watershed Protection Act ("WsPA") Determination of Applicability or Variance (if required); Construction & Access Permit; and Short-term and Vehicle Access to Quabbin and Ware River Watershed System Permit	DCR WsPA Permit target filing May 26 2026; DCR Watershed Access Permit target filing July 2026; DCR Parks and Recreation Access Permit target filing June 2026.
Massachusetts Department of Transportation ("MassDOT")	Permit to Access State Highway/Non-Municipal Utility Permits for crossing over of state roads with utility lines.	Target filing October 2026.
Local/Municipal		
Conservation Commissions in Auburn, Belchertown, Conway, Deerfield, East Brookfield, Leicester, Leverett, Millbury, North Brookfield, Pelham, Shelburne, Shutesbury, Spencer, Sunderland, Ware, and West Brookfield	Order of Conditions ("OOC") per the Massachusetts Wetland Protection Act ("MA WPA")[2] and local bylaws.	Anticipated Summer/Fall 2026

[2] MA WPA Orders of Conditions are local permits unless and until a superseding Order of Conditions is issued by MassDEP.