DRAFT

Weston & Sampson SM

westonandsampson.com

WESTON & SAMPSON ENGINEERS, INC.
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
tel: 978.532.1900

REPORT

August 2024

CITY OF
Boston
MASSACHUSETTS

Analysis of Brownfields Cleanup Alternatives (ABCA)
778-796 Parker and 77 Terrace Streets
Boston, Massachusetts

Analysis of Brownfields Cleanup Alternatives
778-796 Parker Street/77 Terrace Street
Boston, Massachusetts

I. Introduction & Background

This Analysis of Brownfields Cleanup Alternatives (ABCA) has been prepared to evaluate cleanup alternatives for the 778-796 Parker Street/77 Terrace Street Site (the Site), located in Boston Massachusetts. The ABCA is a condition of the City of Boston's cleanup activities, which are being funded under a Brownfields Cleanup Grant provided by the United States Environmental Protection Agency (EPA).

1. Site Location

The Site is approximately 1.3 acres and consists of eleven (11) contiguous parcels in a mixed residential/commercial area of the Roxbury neighborhood. The largest parcel, 77 Parker Street, is approximately 0.65 acres and makes up the eastern half of the Site. This parcel was formerly developed for commercial/industrial uses. The remaining 10 parcels are located on the western edge of the Site and were formerly developed for residential uses. No buildings or permanent structures are currently present at the Site. The Site was formerly used by the local community for gardening and passive open space.

2. Previous Site Use(s) and Any Previous Cleanup / Remediation

The 77 Terrace Street parcel was developed with a brewery (Union Brewing Company and later the J.W. Kenney Park Brewery) from the late 1800's through the early 1900's. This parcel was later owned by a distillery (Highland Distillery) in the 1940s and was later repurposed as a plumbing supplier (Standard Plumbing Supply Company) by the early 1960s.

The ten contiguous parcels along Parker Street (778-796 Parker Street) were developed for residential use sometime prior to the late 1800s. All of the Site buildings were demolished between 1964 and 1988 and the Site has remained vacant since that time. Several assessment activities have been completed to date, but no cleanup/remediation has occurred at the Site.

3. Site Assessment Findings

i. Phase I Environmental Site Assessment, Coler & Colantonio, Inc. December 2000

In December 2000, a Phase I ESA was completed for the 77 Terrace Street parcel. This assessment also included the completion of eight (8) test pits and the collection of soil samples from the test pits. Samples were analyzed for volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), RCRA 8 metals, and extractable petroleum hydrocarbons (EPH). Petroleum hydrocarbons (C19-C-36 aliphatic hydrocarbons and C11-C22 aromatic hydrocarbons), several PAHs, and lead were identified above the reportable concentration (RCS-1) standards at the time. No other recognized environmental conditions (RECs) were identified.

ii. Class B-1 Response Action Outcome (RAO) Statement, Woodard & Curran December 2001

This assessment was conducted to assess the conditions identified by the December 2000 Coler & Colantonio assessment. This included the completion of a geophysical survey to assess for the potential for unidentified underground storage tanks (USTs) and the advancement of ten (10) soil borings. Soil samples from each boring were analyzed for EPH and total lead.

The geophysical survey found no evidence of remaining USTs. Analytical results were consistent with previous work, including elevated PAHs and lead. Woodard & Curran noted that there was significant evidence that the identified exceedances were attributable to the presence of wood and coal ash in fill material. They concluded that the concentrations were consistent with background levels typically found in anthropogenic urban fill material containing wood and coal ash.

iii. Phase I Environmental Site Assessment, Woodard & Curran October 2012

This Phase I ESA was conducted for the entire Site, including the 77 Terrance Street parcel for which assessment was conducted in 2000 and 2001, and the contiguous ten residential parcels along Parker Street (778-796 Parker Street). No RECs were identified. The presence of petroleum hydrocarbons, PAHs, and lead in soil at 77 Terrace Street was identified as a historical recognized environmental condition (HREC), a condition that has been addressed to the satisfaction of the applicable regulatory authority and does not require institutional or engineering controls.

iv. Limited Subsurface Environmental and Geotechnical Investigation, EBI Consulting February 2014

In 2014, in advance of the potential development of the Site, EBI Consulting (EBI) completed a limited subsurface investigation to determine the distribution of lead and EPH, establish if elevated lead concentrations would lead to the characterization of some soil as hazardous waste, and determine if groundwater had been impacted by historical Site uses. EBI advanced eight (8) borings up to 35 feet below ground surface (ft. bgs) and excavated eleven (11) test pits to depths up to 14 ft. bgs. Groundwater was not encountered (apart from a perched layer in a void space/former basement area) to a maximum boring depth of 35 ft. bgs, and no monitoring wells were installed. Selected soil samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) lead and EPH.

The results of soil analysis were generally consistent with earlier investigations. TCLP analysis of the samples with the highest concentrations of lead identified only one (1) location where soil TCLP concentrations exceeded the RCRA Hazardous Waste criterion for lead (5 mg/l). EBI concluded that an urban fill layer ranging between 3.5 and 21 feet thick is present at the Site and estimated its total volume as approximately 21,300 cubic yards.

v. Phase II Environmental Site Assessment, Weston & Sampson October 2021

Due to the impacts identified in imported fill at the Site, a Phase II ESA was completed in October 2021 to further evaluate the nature and extent of impacted soil. This assessment included the excavation of eight (8) test pits to depths of between 8 and 10 ft. bgs. Samples were collected and analyzed for VOCs, SVOCs, PCBs, RCRA 8 metals, and EPH.

Results were generally consistent with previous assessments, and identified metals (arsenic, chromium, and lead) and PAHs above the respective RCS-1. No PCB concentrations were identified above the RCS-1 (1 mg/kg).

4. Project Goal

The goals of the project are to protect human health and the environment and to redevelop an underutilized property for residential use. The objective is to remove targeted impacted soils from the site that pose a potential exposure risk to future residential users of the Site. Once complete, a Permanent Solution Statement (PSS) will be filed to close response actions under the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000).

5. Regional Site Vulnerabilities

The northeastern United States, including the Boston area, experiences warm and often humid summers and cold winters. Rainfall can be severe with summer thunderstorms common and severe weather resulting from regional nor'easter anticyclone storms and/or hurricanes. Winter conditions can also be severe with ice storms and heavy snow common.

According to the US Global Change Research Program (USGCRP), the northeastern United States can expect increased temperatures and temperature variability and extreme precipitation events (see Attachment A). USGCRP notes that "heat waves, coastal flooding, and river flooding will pose a growing challenge to the region's environmental, social, and economic systems. This will increase the vulnerability of the region's residents, especially its most disadvantaged populations." Increased precipitation will increase stormwater runoff, which is applicable to the cleanup and redevelopment of the Site for residential reuse and open space. The redeveloped Site is expected to include improved stormwater infrastructure which will account for increasing precipitation.

The Site is located outside the 100-year flood plain. According to FEMA National Flood Hazard Layer FIRMette, the Site is located within a Zone X, an area of minimal flood hazard (see Attachment B); however, greater storm frequency and intensity may result in more frequent and powerful floods, resulting in updates to the flood zone and increased risk of flooding.

Based on the location of the Site and its proposed reuse, other factors related to climate change, such as changing temperature, rising sea levels, wildfires, changing dates of ground thaw/freezing, changing ecological zone, etc.). are unlikely to impact the Site in a significant way.

II. Applicable Regulations and Cleanup Standards

1. Cleanup Oversight Responsibility

2. The cleanup will be overseen by a Commonwealth of Massachusetts Licensed Site Professional (LSP) in accordance with Massachusetts General Law Chapter 21E and the MCP. It is expected that remedial cleanup will be performed under a Release Abatement Measure (RAM) Plan. In addition, required regulatory documents prepared for this Site will be submitted to the Massachusetts Department of Environmental Protection (MassDEP) electronically and tracked under the Release Tracking Number (RTN) issued for the Site by MassDEP (RTN 3-32280). All documents will be in the public record.Cleanup Standards

MassDEP is the state authority that regulates cleanup of sites in the Commonwealth of Massachusetts. The MCP, 310 CMR 40.0000, includes risk-based cleanup standards for use in screening-level and semi-site-specific risk characterizations (Method 1 and Method 2 Risk Characterizations) to evaluate risk to human health and the environment. The MCP also outlines a Method 3 Risk Characterization, in which site-specific cleanup standards and characteristics and/or limitations on use and activity are used to evaluate risk. Under the MCP, regardless of the approach or type of risk characterization, a condition of No Significant Risk (NSR) to human health and the environment must be documented for the site to achieve regulatory closure.

3. Laws and Regulations

Laws and regulations that are applicable to this cleanup include the Federal Small Business Liability Relief and Brownfields Revitalization Act, the Federal Davis-Bacon Act, the MCP, and City by-laws. Federal, state, and local laws regarding procurement of contractors to conduct the cleanup will be followed. As described all cleanup will be in accordance with the MCP; 310 CMR 40.0000. All applicable permits and documentation (e.g., Building Permit, Dig Safe, soil transport/disposal manifests) will be obtained prior to the work commencing, and all work will be conducted in accordance with the conditions for approval.

III. Evaluation of Cleanup Alternatives

1. Cleanup Alternatives Considered

EPA requires that this ABCA includes the evaluation of three (3) remedial alternatives. To address the remediation of impacted soil at the Site, the following three (3) alternatives were considered, including:

- Alternative #1 - No Action
- Alternative #2 – Removal, Transport, and Off-Site Disposal of Targeted Impacted Soil
- Alternative #3 – Extensive Removal, Transport, and Off-Site Disposal of Impacted Soil

2. Cost Estimate of Cleanup Alternatives

To satisfy EPA requirements, the effectiveness, implementability, and cost of each alternative must be considered prior to selecting a recommended cleanup alternative.

<u>Effectiveness – Including Vulnerability/Resiliency Considerations</u>

- Alternative #1: No Action is not effective in controlling or preventing the exposure of receptors to contamination at the Site following redevelopment.

- Alternative #2: Under this alternative, targeted removal of lead impacted soil up to 15 feet below ground surface (ft. bgs) and replacement with clean soil will be completed. Confirmatory sampling will be required to evaluate remaining conditions and associated risk. A Method 3 Risk Characterization will be conducted using post-remediation data. Following remediation, an institutional control in the form of an Activity and Use Limitation (AUL) may be implemented to support the Method 3 Risk Characterization and maintain a condition of NSR at the Site.

This alternative is an effective way to remove the highly impacted soils which are contributing to Site-wide contamination and reduce the overall exposure point concentration across the Site. Depending on the amount of soil removed, this option may not reduce Site-wide lead concentrations to below the threshold for unrestricted use; therefore, institutional controls (i.e., AUL, deed restriction) may be required to mitigate exposure to remaining impacted soil and maintain a condition of NSR.

- Alternative #3: Extensive removal, transport, and off-site disposal of all impacted soil is an effective way to eliminate risk at the Site, since all contamination will be removed, and the exposure pathways will no longer exist.

Implementability

- Alternative #1: No Action is easy to implement since no actions will be conducted.
- Alternative #2: Targeted soil removal requires coordination to maintain environmental controls (e.g., dust suppression and monitoring) during remediation. In addition, this alternative may require the implementation of an AUL on the property; however, this alternative is moderately easy to implement.
- Alternative #3: Extensive excavation with off-site disposal is moderately difficult to implement. Although this alternative will not require ongoing maintenance and monitoring, greater coordination (e.g., dust suppression and monitoring) during cleanup activities and disturbance to the community (e.g., trucks transporting contaminated soils and backfill) are anticipated. Additionally, this alternative is less in line with EPAs green cleanup goals and objectives.

Cost

- Alternative #1: There will be no costs associated with No Action.
- Alternative #2: The targeted removal of impacted soil and replacement is expected to cost approximately $882,000.
- Alternative #3: Based on the preliminary assessment of disposal options completed by EBI in 2014, the removal of all impacted soil is expected to cost approximately $2,260,000.

3. Recommended Cleanup Alternative

Alternative #1: No Action cannot be recommended because it does not address site risk. Alternative #3: Extensive Removal, Transport, and Off-Site Disposal of Impacted Soil, while effective at eliminating the exposure pathways at the Site, the cost to implement such a remedy could approximately be 2.5 times or more than the cost of controlling the exposure risks in Alternative #2. Additionally, Alternative #3 will require many more trucks, will increase impacts to the neighborhood and will take up more space in landfills. Alternative #2 is a more sustainable approach in line with EPA's Clean and Green Cleanup guidelines.

Therefore, Alternative #2 is the most cost effective alternative capable of reducing risk while having the smallest impact on the surrounding community and the environment. For these reasons, the recommended cleanup alternative is Alternative #2: Removal, Transport, and Off-Site Disposal of Targeted Impacted Soil.

Green and Sustainable Remediation Measures for Selected Alternative

The selected alternative is the most sustainable alternative and requires less trucking and disposal of

impacted soil than removing all of the impacted soil. The City of Boston will refer to ASTM Standard E-2893: Standard Guide for Greener Cleanups, EPA's Principles for Greener Cleanups, and MassDEP's Greener Cleanup Guidance (WSC #14-150) to incorporate practices and procedures that reduce carbon emissions, burning of fossil fuels, and the impact on the environment. This will include standard specifications prohibiting equipment idling, encouraging the selection of disposal facilities that are not at excessive distance, and requiring reuse/recycling/treatment over disposal when available.

In addition, the redevelopment plan includes elements of sustainable design such as reduced embodied carbon in construction materials; no fossil fuel systems for heating, cooling, hot water, and appliances; and aims for net zero emissions for post-construction operations.

ATTACHMENT A

Fourth National Climate Assessment

Impacts, Risks, and Adaptation in the United States: Volume II - Northeast

18 Northeast

Bartram Bridge in Pennsylvania

Key Message 1

Changing Seasons Affect Rural Ecosystems, Environments, and Economies

The seasonality of the Northeast is central to the region's sense of place and is an important driver of rural economies. Less distinct seasons with milder winter and earlier spring conditions are already altering ecosystems and environments in ways that adversely impact tourism, farming, and forestry. The region's rural industries and livelihoods are at risk from further changes to forests, wildlife, snowpack, and streamflow.

Key Message 2

Changing Coastal and Ocean Habitats, Ecosystems Services, and Livelihoods

The Northeast's coast and ocean support commerce, tourism, and recreation that are important to the region's economy and way of life. Warmer ocean temperatures, sea level rise, and ocean acidification threaten these services. The adaptive capacity of marine ecosystems and coastal communities will influence ecological and socioeconomic outcomes as climate risks increase.

Key Message 3

Maintaining Urban Areas and Communities and Their Interconnectedness

The Northeast's urban centers and their interconnections are regional and national hubs for cultural and economic activity. Major negative impacts on critical infrastructure, urban economies, and nationally significant historic sites are already occurring and will become more common with a changing climate.

Key Message 4

Threats to Human Health

Changing climate threatens the health and well-being of people in the Northeast through more extreme weather, warmer temperatures, degradation of air and water quality, and sea level rise. These environmental changes are expected to lead to health-related impacts and costs, including additional deaths, emergency room visits and hospitalizations, and a lower quality of life. Health impacts are expected to vary by location, age, current health, and other characteristics of individuals and communities.

Key Message 5

Adaptation to Climate Change Is Underway

Communities in the Northeast are proactively planning and implementing actions to reduce risks posed by climate change. Using decision support tools to develop and apply adaptation strategies informs both the value of adopting solutions and the remaining challenges. Experience since the last assessment provides a foundation to advance future adaptation efforts.

Executive Summary

The distinct seasonality of the Northeast's climate supports a diverse natural landscape adapted to the extremes of cold, snowy winters and warm to hot, humid summers. This natural landscape provides the economic and cultural foundation for many rural communities, which are largely supported by a diverse range of agricultural, tourism, and natural resource-dependent industries (see Ch. 10: Ag & Rural, Key Message 4).[1] The recent dominant trend in precipitation throughout the Northeast has been towards increases in rainfall intensity,[2] with increases in intensity exceeding those in other regions of the contiguous United States. Further increases in rainfall intensity are expected,[3] with increases in total precipitation expected during the winter and spring but with little change in the summer.[4] Monthly precipitation in the Northeast is projected to be about 1 inch greater for December through April by end of century (2070–2100) under the higher scenario (RCP8.5).[4]

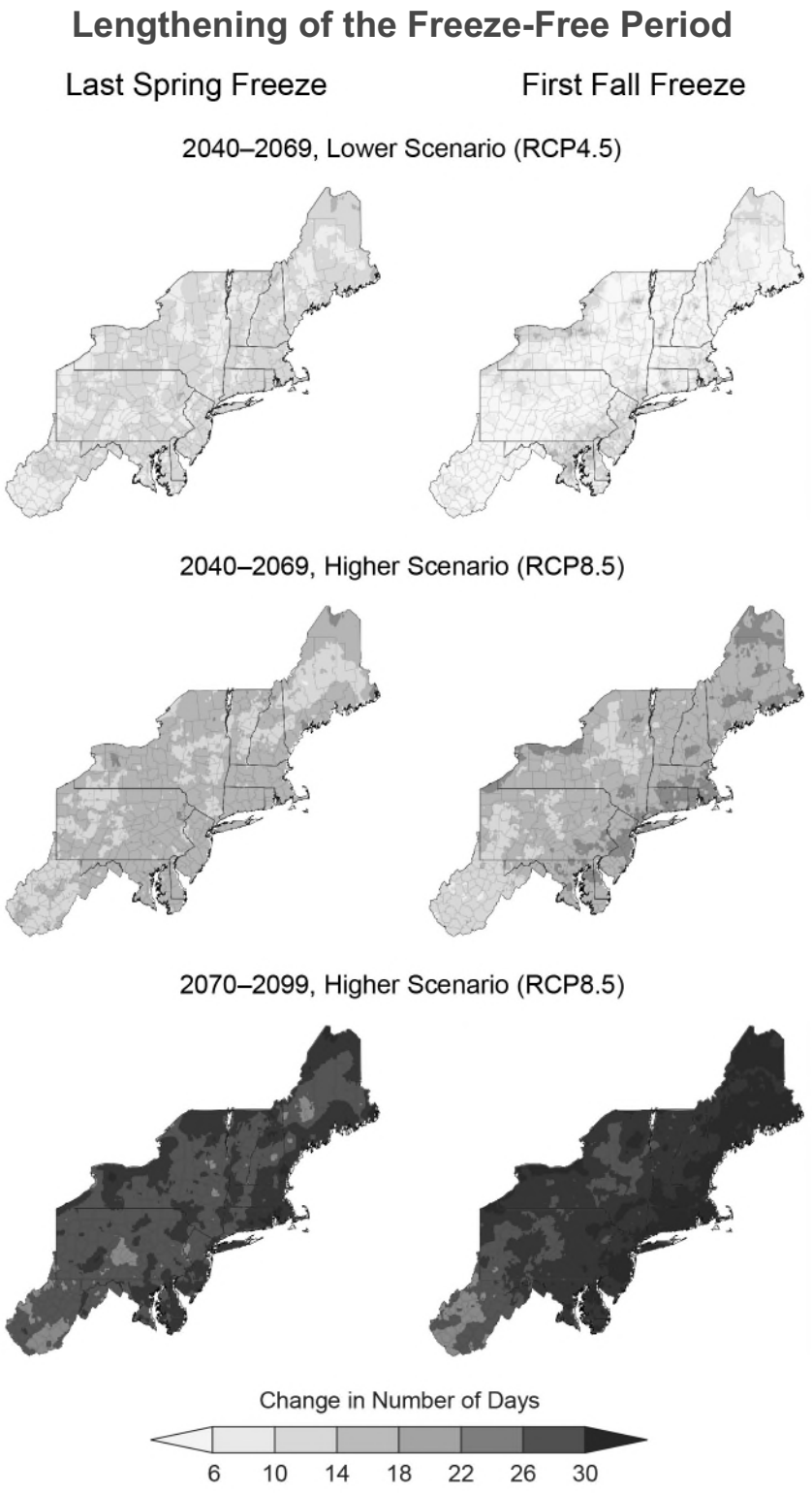
Ocean and coastal ecosystems are being affected by large changes in a variety of climate-related environmental conditions. These ecosystems support fishing and aquaculture,[5] tourism and recreation, and coastal communities.[6] Observed and projected increases in temperature, acidification, storm frequency and intensity, and sea levels are of particular concern for coastal and ocean ecosystems, as well as local communities and their interconnected social and economic systems. Increasing temperatures and changing seasonality on the Northeast Continental Shelf have affected marine organisms and the ecosystem in various ways. The warming trend experienced in the Northeast Continental Shelf has been associated with many fish and invertebrate species moving northward and to greater depths.[7,8,9,10,11] Because of the diversity of the Northeast's coastal landscape, the impacts

from storms and sea level rise will vary at different locations along the coast.[12,13]

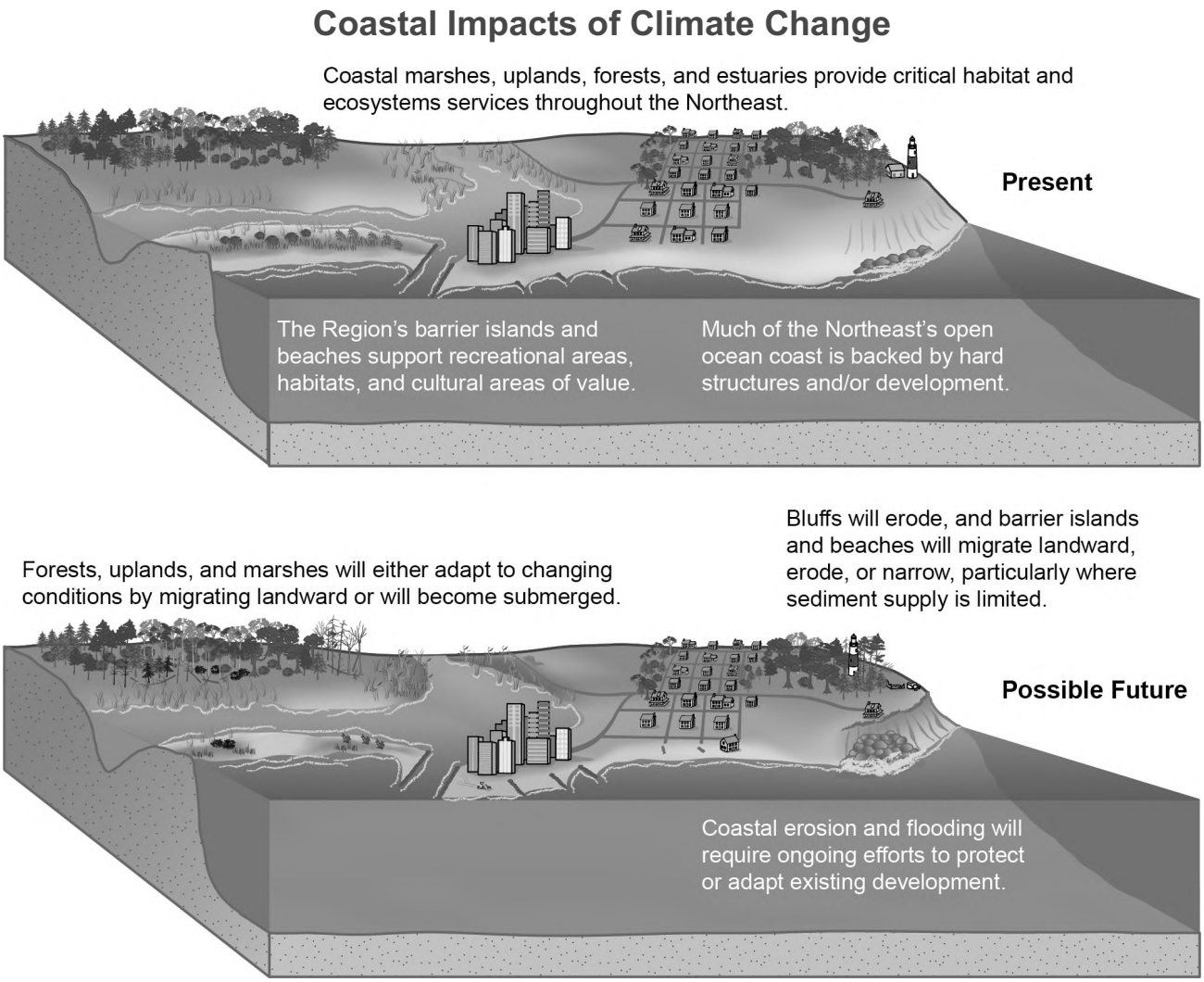
Northeastern cities, with their abundance of concrete and asphalt and relative lack of vegetation, tend to have higher temperatures than surrounding regions due to the urban heat island effect. During extreme heat events, nighttime temperatures in the region's big cities are generally several degrees higher than surrounding regions, leading to higher risk of heat-related death. Urban areas are at risk for large numbers of evacuated and displaced populations and damaged infrastructure due to both extreme precipitation events and recurrent flooding, potentially requiring significant emergency response efforts and consideration of a long-term commitment to rebuilding and adaptation, and/or support for relocation where needed. Much of the infrastructure in the Northeast, including drainage and sewer systems, flood and storm protection assets, transportation systems, and power supply, is nearing the end of its planned life expectancy. Climate-related disruptions will only exacerbate existing issues with aging infrastructure. Sea level rise has amplified storm impacts in the Northeast (Key Message 2), contributing to higher surges that extend farther inland, as demonstrated in New York City in the aftermath of Superstorm Sandy in 2012.[14,15,16] Service and resource supply infrastructure in the Northeast is at increasing risk of disruption, resulting in lower quality of life, economic declines, and increased social inequality.[17] Loss of public services affects the capacity of communities to function as administrative and economic centers and triggers disruptions of interconnected supply chains (Ch. 16: International, Key Message 1).

Increases in annual average temperatures across the Northeast range from less than 1°F (0.6°C) in West Virginia to about 3°F (1.7°C) or more in New England since 1901.[18,19] Although the relative risk of death on very hot days is lower today than it was a few decades ago, heat-related illness and death remain significant public health problems in the Northeast.[20,21,22,23] For example, a study in New York City estimated that in 2013 there were 133 excess deaths due to extreme heat.[24] These projected increases in temperature are expected to lead to substantially more premature deaths, hospital admissions, and emergency department visits across the Northeast.[23,25,26,27,28,29] For example, in the Northeast we can expect approximately 650 additional premature deaths per year from extreme heat by the year 2050 under either a lower (RCP4.5) or higher (RCP8.5) scenario and from 960 (under RCP4.5) to 2,300 (under RCP8.5) more premature deaths per year by 2090.[29]

Communities, towns, cities, counties, states, and tribes across the Northeast are engaged in efforts to build resilience to environmental challenges and adapt to a changing climate. Developing and implementing climate adaptation strategies in daily practice often occur in collaboration with state and federal agencies (e.g., New Jersey Climate Adaptation Alliance 2017, New York Climate Clearinghouse 2017, Rhode Island STORMTOOLS 2017, EPA 2017, CDC 2015[30,31,32,33,34]). Advances in rural towns, cities, and suburban areas include low-cost adjustments of existing building codes and standards. In coastal areas, partnerships among local communities and federal and state agencies leverage federal adaptation tools and decision support frameworks (for example, NOAA's Digital Coast, USGS's Coastal Change Hazards Portal, and New Jersey's Getting to Resilience). Increasingly, cities and towns across the Northeast are developing or implementing plans for adaptation and resilience in the face of changing climate (e.g., EPA 2017[33]). The approaches are designed to maintain and enhance the everyday lives of residents and promote economic development. In some cities, adaptation planning has been used to respond to present and future challenges in the built environment. Regional efforts have recommended changes in design standards when building, replacing, or retrofitting infrastructure to account for a changing climate.



These maps show projected shifts in the date of the last spring freeze (left column) and the date of the first fall freeze (right column) for the middle of the century (as compared to 1979–2008) under the lower scenario (RCP4.5; top row) and the higher scenario (RCP8.5; middle row). The bottom row shows the shift in these dates for the end of the century under the higher scenario. By the middle of the century, the freeze-free period across much of the Northeast is expected to lengthen by as much as two weeks under the lower scenario and by two to three weeks under the higher scenario. By the end of the century, the freeze-free period is expected to increase by at least three weeks over most of the region. *From Figure 18.3 (Source: adapted from Wolfe et al. 2018[35]).*



(top) The northeastern coastal landscape is composed of uplands and forested areas, wetlands and estuarine systems, mainland and barrier beaches, bluffs, headlands, and rocky shores, as well as developed areas, all of which provide a variety of important services to people and species. (bottom) Future impacts from intense storm activity and sea level rise will vary across the landscape, requiring a variety of adaptation strategies if people, habitats, traditions, and livelihoods are to be protected. *From Figure 18.7 (Source: U.S. Geological Survey)*.

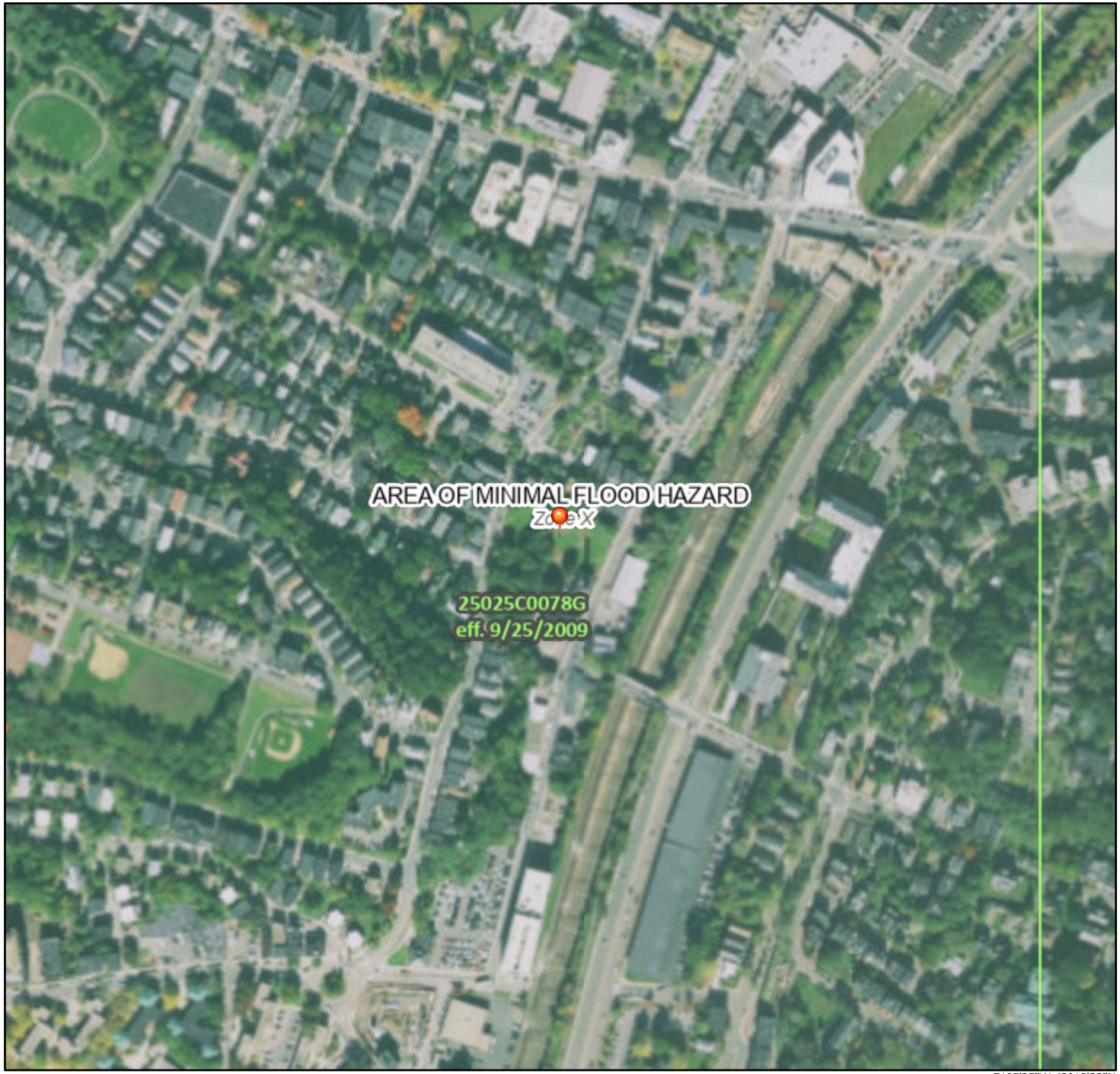
ATTACHMENT B

FEMA National Flood Hazard Layer FIRMette

National Flood Hazard Layer FIRMette

FEMA

71°6'12"W 42°19'59"N



71°5'35"W 42°19'33"N

0 250 500 1,000 1,500 2,000 Feet 1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/25/2021 at 12:29 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.