

APPENDIX F
WETLANDS MEMORANDUM



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Wetland Delineation Report



November 2024

Worcester, Massachusetts
Project # ENG24-0977

Beaver Brook Dog Park
Worcester, MA

Wetland Delineation Conducted By:
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Delineation Report Reviewed By:
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1.0 SITE DESCRIPTION

On November 4th, 2024, the presence of wetland resources was investigated near the Beaver Brook Dog Park at 300 Chandler Street in Worcester, MA. This investigation area is located adjacent to athletic fields and residential homes. Please see Figure 1 (Wetlands Field Map) and Figure 2 (USGS Topographic Map) of this report for the investigation area.

A single perennial stream (Beaver Brook) was identified and flagged in the field using pink flagging by a Weston & Sampson employee who is trained in the wetland delineation process using the Massachusetts Department of Environmental Protection (MassDEP) and the US Army Corps of Engineers methodology.

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2.0 DELINEATION OF WETLAND RESOURCES

2.1 Site Observations

The Weston & Sampson wetland scientist, trained in the ACOE Wetland Delineation Manual and Massachusetts Department of Environmental Protection (MassDEP) Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetland Protection Act guidance document, observed the following protected wetland resources at the site:

- Bank – Perennial Stream

See Appendix A for site photographs.

2.2 Wetland Delineation Methodology

A wetland delineation assessment was conducted in accordance with the Massachusetts Wetland Protection Act Regulations (310 CMR 10.55(2)(c)), Massachusetts Department of Environmental Protection (MassDEP) Massachusetts Handbook for Delineation of Bordering Vegetated Wetlands (Second Edition, September 2022), ACOE Wetland Manual (Technical Report Y-87-1), and the City of Worcester Wetlands Protection Ordinance and Wetlands Protection Regulations.

The bordering vegetated wetlands (BWV) delineation methodology included the characterization of vegetation, hydrologic conditions, and soil in both wetland and upland areas to identify the transitional area, which was used as the wetland limit. Pink flags with distinct flag numbers were left in the field to show wetland resource area limits.

Vegetation, hydrology and soils were assessed in both wetland and upland areas to accurately place the wetland limits at each site. The percentage of vegetative species was estimated by creating sample plots. Sample plot radius for trees, saplings, shrubs, groundcover and woody vine strata was 30', 15', 15', 5' and 30', respectively. After creating the sample plot areas, the percent basal area coverage of each species within the monitoring plot was recorded. Using these field observations, the percent dominance of each species within its stratum was calculated. The 50/20 Rule was then used to determine dominance. Dominant species were considered the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceeds 50% of the total dominance measure (basal area) for the stratum, plus any additional species comprising 20%

or more of the total dominance measure for the stratum. Once the dominant species were determined, they were treated equally to determine the presence of hydrophytic vegetation. If the number of dominant species with a Wetland Indicator Status of FAC (excluding FAC-), FACW or OBL is greater than, or equal to, the number of remaining dominant species, the area was considered a jurisdictional wetland resource area based on vegetation.

To determine if the soil sample was considered a hydric (wetland) soil. Soil samples, including mottles, were characterized based on color using Munsell Soil-Color charts as a color reference.

The general area was then assessed for hydrologic conditions, including, but not limited to, site inundation, depth to free water, depth of soil saturation, water marks, drift lines, sediment deposits, water-stained leaves.

No Bordering Vegetated Wetlands were identified on site. Wetland resources areas identified in the field were limited to on perennial stream (Beaver Brook), described below.

2.3 Bank

Water bodies, including perennial streams, intermittent streams, ponds and lakes, have banks which are protected by the Massachusetts Wetland Protection Act. Bank is a wetland resource area defined by 310 CMR 10.54(2)(a) as “the portion of land surface which normally abuts and confines a water body. It occurs between a waterbody and a vegetated bordering wetland and adjacent floodplain, or, in absence of these, it occurs between a waterbody and an upland.” Vegetated banks provide valuable functions such as flood control, stormwater prevention, fisheries protection, and water quality protection. The limit of this resource area is identified by Top of Bank (TOB) which is located at the first observable break in slope or the Mean Annual Flood Level (MAFL), whichever is lower. TOB is easily identified in the field so that indicator was utilized for this wetland delineation.

Perennial Stream Banks

A single perennial stream known as Beaver Brook was identified within the investigation area. The boundary of the perennial stream was identified in the field utilizing Top of Bank (TOB), identified by flag line TOB-A. The Beaver Brook is shown as perennial on the current United States Geographical Survey

(USGS) map. The boundary of the perennial stream was identified in the field by the first observable break in slope (TOB). The western bank of Beaver Brook was delineated using the following flag series:

- TOB-A1 through TOB-A13 (Perennial Stream Bank "A" Series)

Perennial streams are normally subject to a 200-foot Riverfront Area under the Massachusetts Wetland Protection Act per 301 CMR 10.58(2)(a)(2)(c) however, the City of Worcester is a municipality that is identified in 310 CMR 10.58(2)(a)3.a. as having a 25-foot Riverfront Area due to development.

FEMA Flood Insurance Rate Maps (FIRM) were created online from the FEMA website to determine if there is a 100-year flood zone at the site. See Figure 3 for FIRM map. Based on FEMA flood maps the investigation area is located within the 100-year flood zone, Zone AE, base flood elevation 485 feet NAD88. The 100-year floodplain is regulated as Bordering Land Subject to Flooding (BLSF) under the Wetlands Protection Act at 310 CMR 10.57.

2.4 Other Protected Areas

Weston & Sampson created environmental resources maps (see Figure 4) of the site to determine the presence of other protected areas. The data source of these map layers was the Massachusetts Geographic Information System (MassGIS). These areas included:

- NHESP Priority Habitats of Rare Species
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Certified and Potential Vernal Pools
- Areas of Critical Environmental Concern (ACEC)
- Outstanding Resource Waters (ORW)
- Coldwater Fisheries
- Article 97 Land

Wetland resources identified in the field were also added to these maps. Based on the MassGIS information, the entire site is located with Article 97 land (protected open space, managed by the City of Worcester Parks Department). The site is not located with NHESP- mapped rare species habitat, nor

is it located with an Area of Critical Environmental Concern (ACEC) or an Outstanding Resource Water (ORW).

3.0 SUMMARY

On November 4th, 2024, the presence of wetland resources was investigated near the Beaver Brook Dog Park (300 Chandler Street) in Worcester, MA. A single perennial stream was identified and flagged at the site.

Additional environmental mapping was conducted using MassGIS data layers and FEMA FIRM mapping. This additional mapping indicates that the entire site is located within Article 97 land and the 100-year flood zone, regulated as Bordering Land Subject to Flooding.

This Wetlands Delineation Report has been reviewed and approved by a Professional Wetland Scientist PWS.

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4.0 REFERENCES

Massachusetts Department of Environmental Protection. September 2022. "Massachusetts Handbook for Delineation of Bordering Vegetated Wetlands – Second Edition".

Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program. Massachusetts Natural Heritage Atlas, 13th Edition with 2017 web updates. Accessed on 11/4/2024.

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USACOE, January 1987, Corps of Engineers Wetlands Delineation Manual, Wetlands Research Program Technical Report Y-87-1.

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Tiner, Jr., Ralph W, 2009, Field Guide to Tidal Wetland Plants of the Northeastern United States and Neighboring Canada.

Wojtec, Michael, Bard – A field Guide to Trees of the Northeast.

New England Hydric Soils Technical Committee, 2019, Version 4, *Field Indicator of Identifying Hydric Soils in New England*. New England Interstate Water Pollution Control Commission, Lowell, MA.



- Investigation Area
- TOB- Perennial Stream
- MA Towns
- DEP Wetland Areas**
- Marsh/Bog
- Wooded marsh
- Cranberry Bog
- Salt Marsh
- Open Water
- Reservoir (with PWSID)
- Tidal Flats
- Beach/Dune

FIGURE 1
Beaver Brook Dog Park
Worcester MA
Wetlands Field Map



Data Source: Office of Geographic and Environmental Information (MassGIS), Maxar, Microsoft



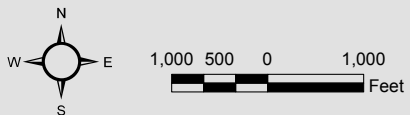
Legend

— Investigation Area

FIGURE 2

Beaver Brook Dog Park
Worcester MA

USGS Topographic Map



Data Source: Office of Geographic and Environmental Information (MassGIS),
Copyright: © 2013 National Geographic Society, i-cubed

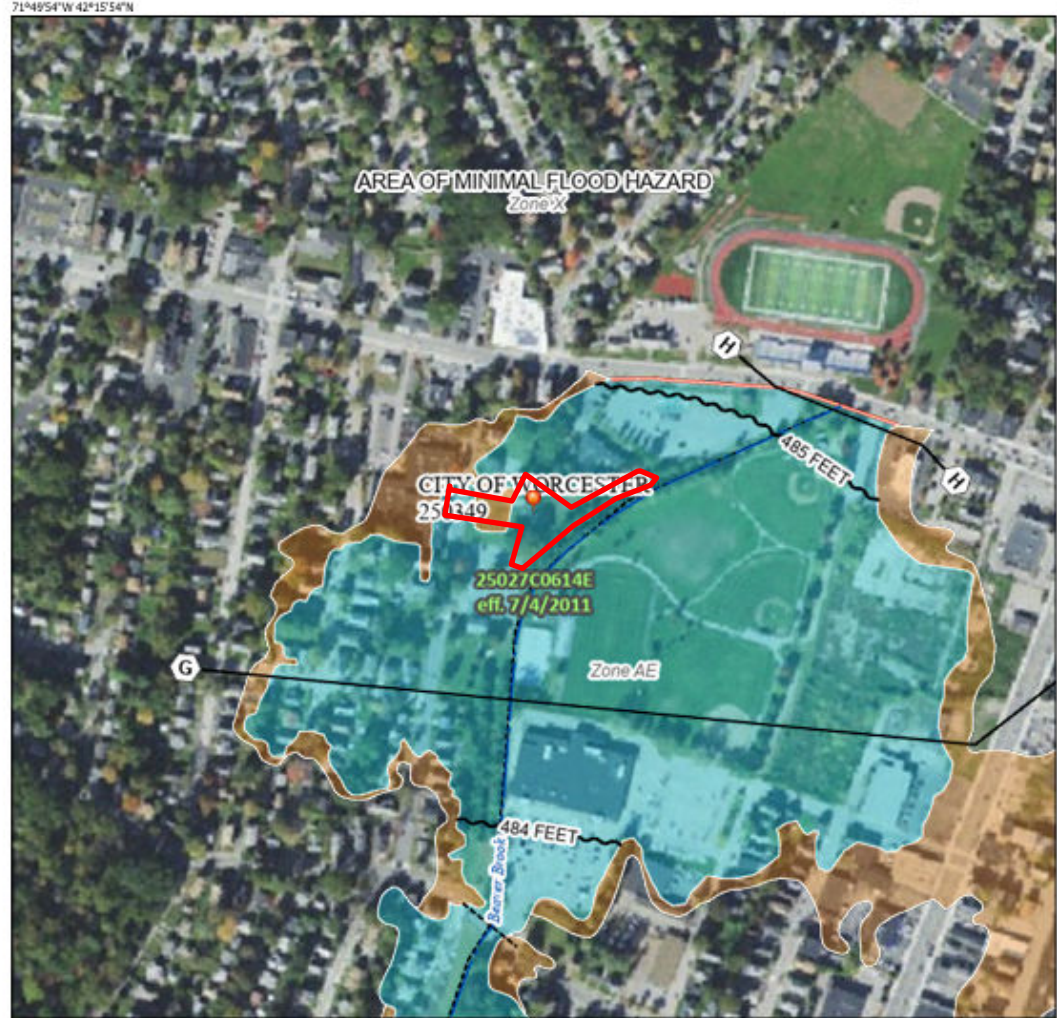
National Flood Hazard Layer FIRMette



Legend

SEE HIS REPORT FOR DETAILED LEGENDS AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	<ul style="list-style-type: none"> Without Base Flood Elevation (BFE) Zone A, X, AGG With BFE or Depth Zone AE, AD, AV, VE, AP Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	<ul style="list-style-type: none"> 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 Levees. See Notes. Zone X Area with Flood Risk due to Levee Zone D
OTHER AREAS	<ul style="list-style-type: none"> Area of Minimal Flood Hazard Zone X Effective LOMRs Area of Undetermined Flood Hazard Zone
GENERAL STRUCTURES	<ul style="list-style-type: none"> Channel, Culvert, or Storm Sewer Levee, Dike, or Floodwall
OTHER FEATURES	<ul style="list-style-type: none"> Cross Sections with 1% Annual Chance Water Surface Elevation Coastal Transect Base Flood Elevation Line (BFE) Limit of Study Jurisdiction Boundary Coastal Transect Baseline Profile Baseline Hydrographic Feature
MAP PANELS	<ul style="list-style-type: none"> Digital Data Available No Digital Data Available Unmapped <p>The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.</p>



Basemap Imagery Source: USGS National Map 2023

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 11/11/2024 at 2:44 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.

Legend

— Investigation Area

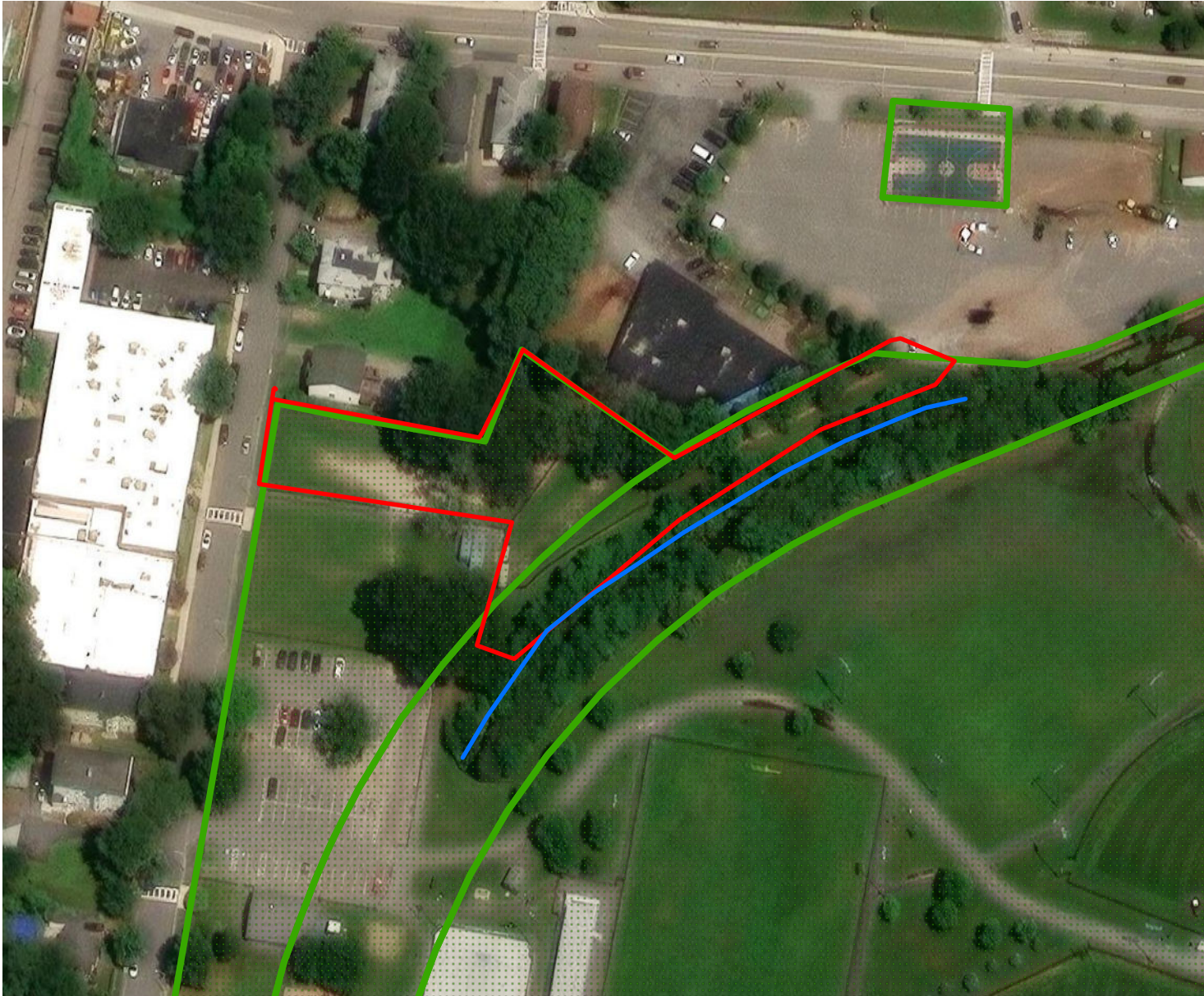
FIGURE 3

Beaver Brook Dog Park
Worcester MA

FEMA Map

Data Source: FEMA, USGS National Map 2023



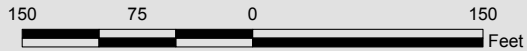


Legend

- Investigation Area
- TOB- Perennial Stream
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Priority Habitats of Rare Species
- * NHESP Certified Vernal Pools
- * NHESP Potential Vernal Pools
- Cold Water Fisheries
- Outstanding Resource Waters
- Public Water Supply Contributor
- ORW for ACEC
- ORW for both Water Supply and Other
- ACECs
- Article 97 Land

FIGURE 4

Beaver Brook Dog Park
Worcester MA
Environmental
Receptors Map



Data Source: Office of Geographic and Environmental Information (MassGIS), Maxar, Microsoft, NHESP, MassGIS



APPENDIX A

Site Photographs



Photo 1: TOB-A Series



Photo 2: TOB-A Series