

MEMORANDUM

TO: Charles River Watershed Association

FROM: Weston & Sampson

DATE: April 12, 2023, Updated May 24, 2023

SUBJECT: Eagle Dam Removal Phase II
Sub-task 3.1: Field “Survey” and “Investigations”

This technical memorandum documents the field work completed to support the Fiscal Year 2023 Municipal Vulnerability Preparedness (MVP) Action Grant for the Town of Wrentham related to the Phase II Feasibility Assessment and Community Outreach for Eagle Dam. During Phase I, previously completed, discrepancies between the structural height of Eagle Lake Dam (MA02263)¹ listed in the Inspection/Evaluation Report and the structural height observed in the field were identified. An increase in the structural height can influence both the size and hazard potential classification of the dam.

On February 24, 2023, Weston & Sampson observed existing conditions and collected relevant elevations. The goal of this work was to verify discrepancies identified in Phase I, update information accordingly, and collect additional information necessary to update the hydraulic and hydrologic model (H&H). Handheld GPS equipment² was used to collect the elevations of relevant and accessible structures between Lake Archer in Wrentham and the Main Street crossing in Norfolk. A total of 11 sites along this reach were visited (listed upstream to downstream):

1. The outlet to Lake Archer
2. The outlet to a small pond downstream of Lake Archer
3. Creek Street culvert
4. Red Dam (MA00170)
5. Eagle Lake Dam (MA02263)
6. Route 140 bridge
7. The unnamed dam at Mill Pond
8. The culvert immediately downstream of unnamed dam at Mill Pond
9. Lawrence Street bridge
10. Bush Pond Dam #2 (MA01158)

¹ National Inventory of Dams (NID) Identification Numbering

² Trimble TDC600 Handheld Data Collector, used in coordination Trimble R780 Integrated GNSS System, set to U.S. Survey Feet, accurate to 3" +/- (most data points were accurate to 1.2" or better)

11. City Mills Pond Dam (MA00818)/Main Street

The attached Field Data Collection Index Sheet provides an overview of these sites. Figures 1 through 6 show the specific locations where elevations were collected with the handheld GPS equipment.

At culverts and bridges, where safe, the height and width were measured along with height from invert to road crest. At dams, where safe, height and width of openings were measured and relevant elevations were collected at each structure. For Eagle Lake Dam, several points were collected along the crest of the dam and two points were collected to estimate the spillway elevation as it could not safely be accessed due to flow over the spillway. Elevational data collected at Eagle Dam will be shared with the Office of Dam Safety for their consideration regarding the dam's current classification.

To further support improving the Charles River Flood Model (CRFM) in the Eagle Lake Dam area, elevations were also obtained for one cross section of the channel between Eagle Lake Dam and Route 140. This cross section is located approximately halfway between the dam and Route 140. These spot elevations will be used to add detail to the downstream channel for more reliable model simulation results.

During the site visit, Weston & Sampson also collected Finished Floor Elevations (FFE) of buildings that could potentially be impacted by flooding caused by larger storm events. These buildings were identified by reviewing the FEMA 100-year flood zones as well as the CRFM model simulation results of the 2070 100-year storm event. Buildings located within or near the flooding extents were visited. The elevation at ground surface was collected using the handheld GPS unit and the FFE was estimated by measuring from the ground surface.

The field data collected will be used to confirm and improve the accuracy of the CRFM. FFEs will be used to estimate impacts to a building during a variety of storm events under existing conditions and potential dam removal conditions.

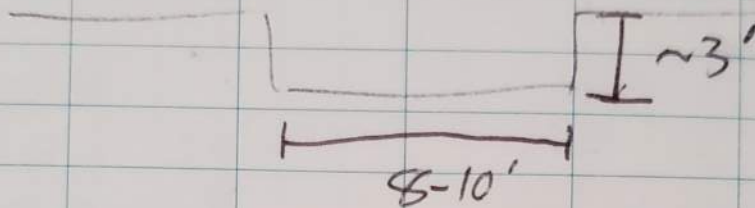
The following attachments are provided as documentation of the field work:

- Attachment A: Field Notes
- Attachment B: February 24, 2023 Photo Log
- Attachment C: Maps
- Attachment D: GPS Data (Electronic)

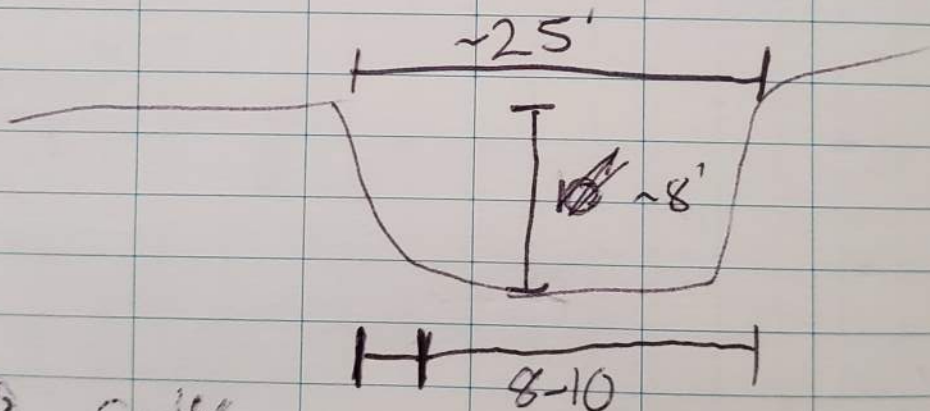
ATTACHMENT A: FIELD NOTES

Lake Archer elevations - tidal

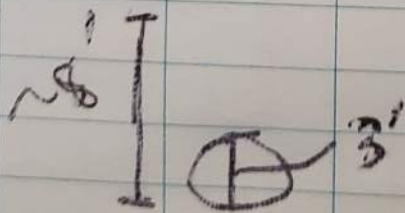
① @ lake



② outlet to d/s pond



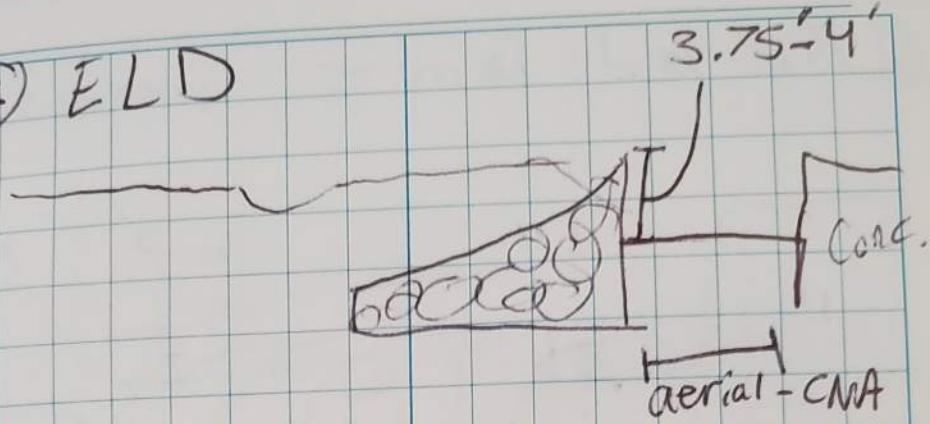
③ culv



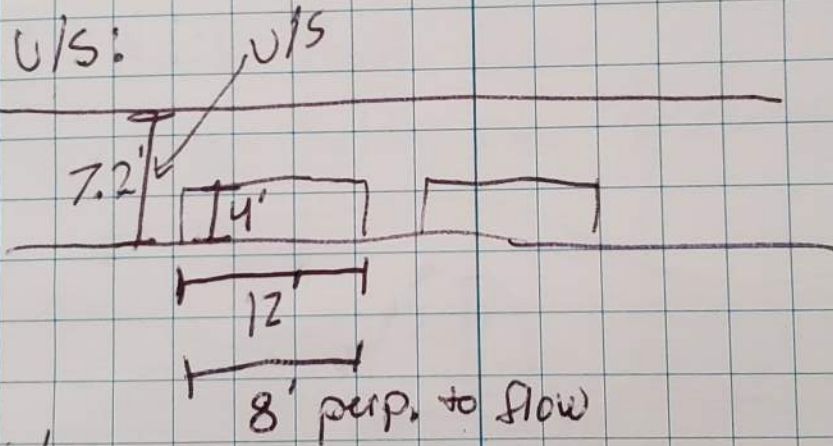
Location _____ Date _____

Project / Client _____

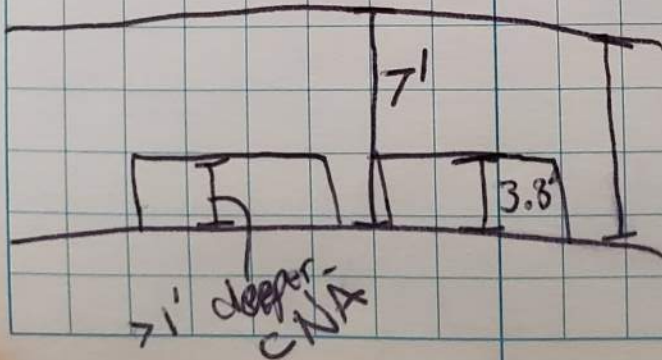
④ ELD



⑤ Rte 140



d/s:

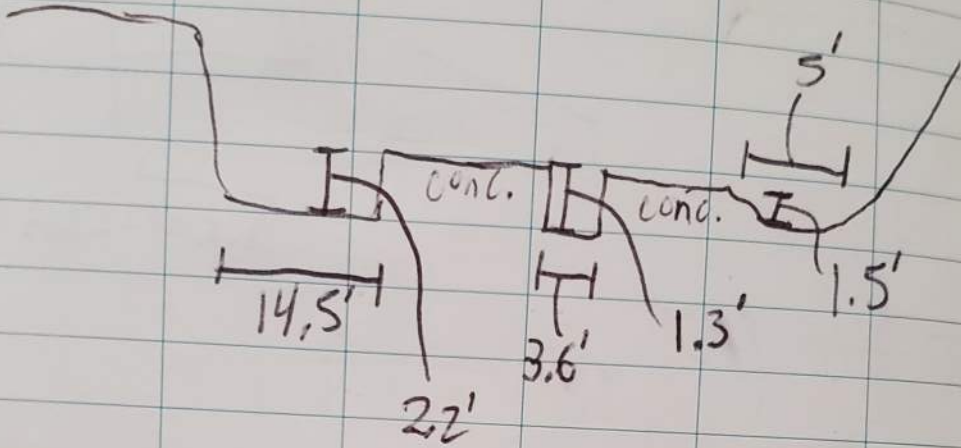


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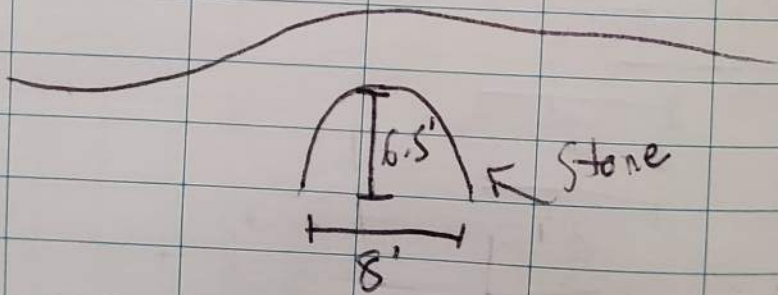
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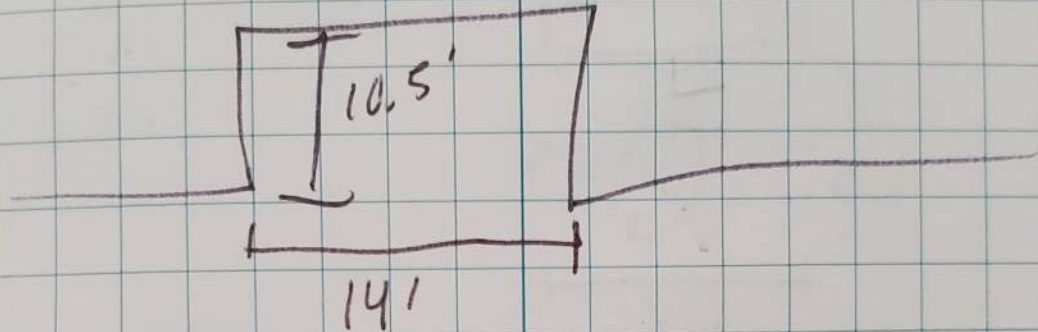
⑥ Mill Pond Dam



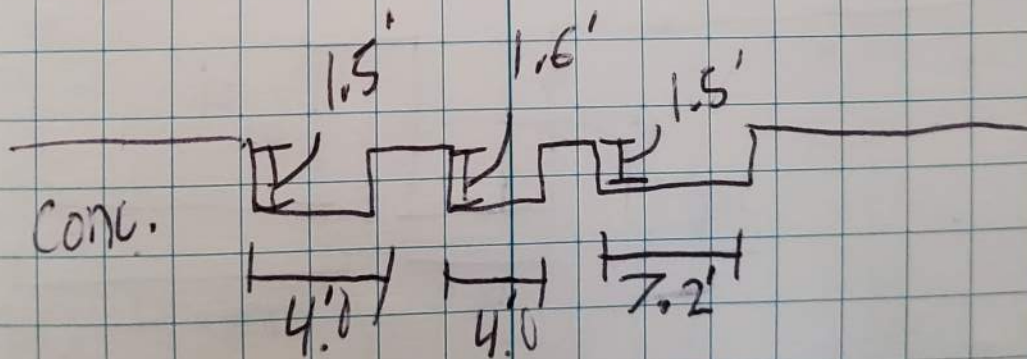
⑦



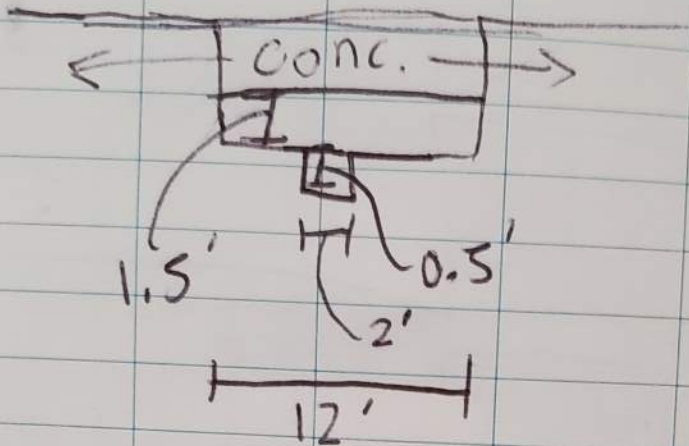
⑧ Lawrence St



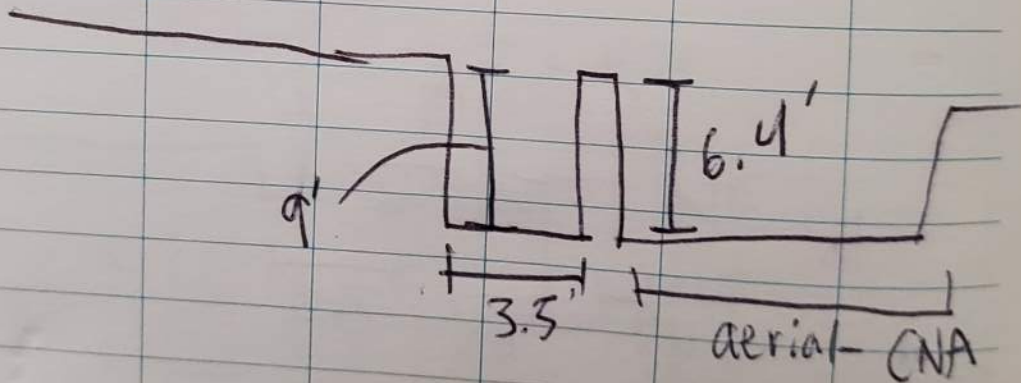
⑨ Bush Pond Dam
- foot bridge over spillways, 1' deck



(10) City Mill Pond Dam



(11) Red Dam



ATTACHMENT B: FEBRUARY 24, 2023
PHOTO LOG



Photo 1: Eagle Lake Dam (MA02263) Embankment looking downstream. Eagle Lake Dam's embankment ungulates with several eroded walking paths, as seen in this photo.



Photo 2: Eagle Lake Dam (MA02263) looking upstream at the primary spillway.



Photo 3: Eagle Lake Dam's (MA02263) primary spillway looking upstream. A staff gage is located on the right training wall.



Photo 4: Unnamed dam at Mill Pond primary spillway. The primary spillway appeared to be a broad crested weir with a fixed angle iron.



Photo 5: Unnamed dam at Mill Pond looking at the two auxiliary spillways from the right abutment of the primary spillway. The left auxiliary spillway is a stoplog-controlled channel, and the right auxiliary spillway is an earthen channel.



Photo 6: Unnamed dam at Mill Pond looking downstream at the stone culvert crossing downstream of the dam. The left auxiliary spillway is pictured above, with the right auxiliary spillway off-camera to the right.



Photo 7: Bush Pond Dam (MA01158) looking at the spillways from the dam embankment. The spillways consisted of three stoplog-controlled channels.



Photo 8: Bush Pond Dam (MA01158) looking downstream at the discharge channel from the pedestrian bridge above the spillways.

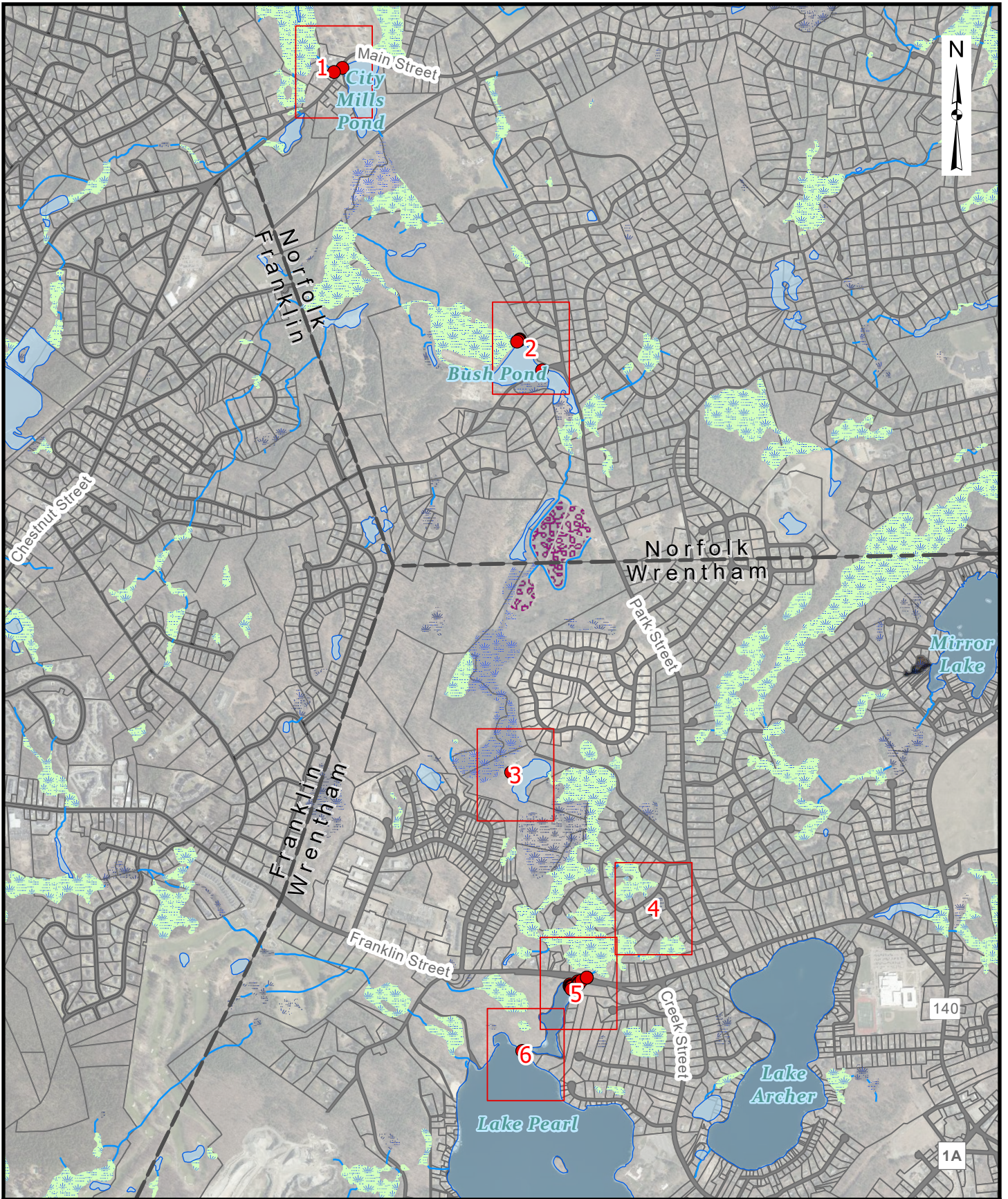


Photo 9: Bush Pond Dam (MA01158) looking upstream at the spillways from the toe of the dam.



Photo 10: Bush Pond Dam (MA01158) looking at the upstream face of the spillways and dam embankment from the edge of Bush Pond.

ATTACHMENT C: MAPS



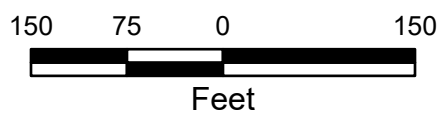
**TOWN OF WRENTHAM MASSACHUSETTS
 FISCAL YEAR 2023 MUNICIPAL VULNERABILITY PREPAREDNESS
 (MVP) ACTION GRANT "Phase II Feasibility Assessment and
 Community Outreach for Eagle Dam"**

FIELD DATA COLLECTION INDEX SHEET



FIGURE 1 of 6
TOWNS OF NORFOLK AND WRENTHAM MASSACHUSETTS

● GPS Points



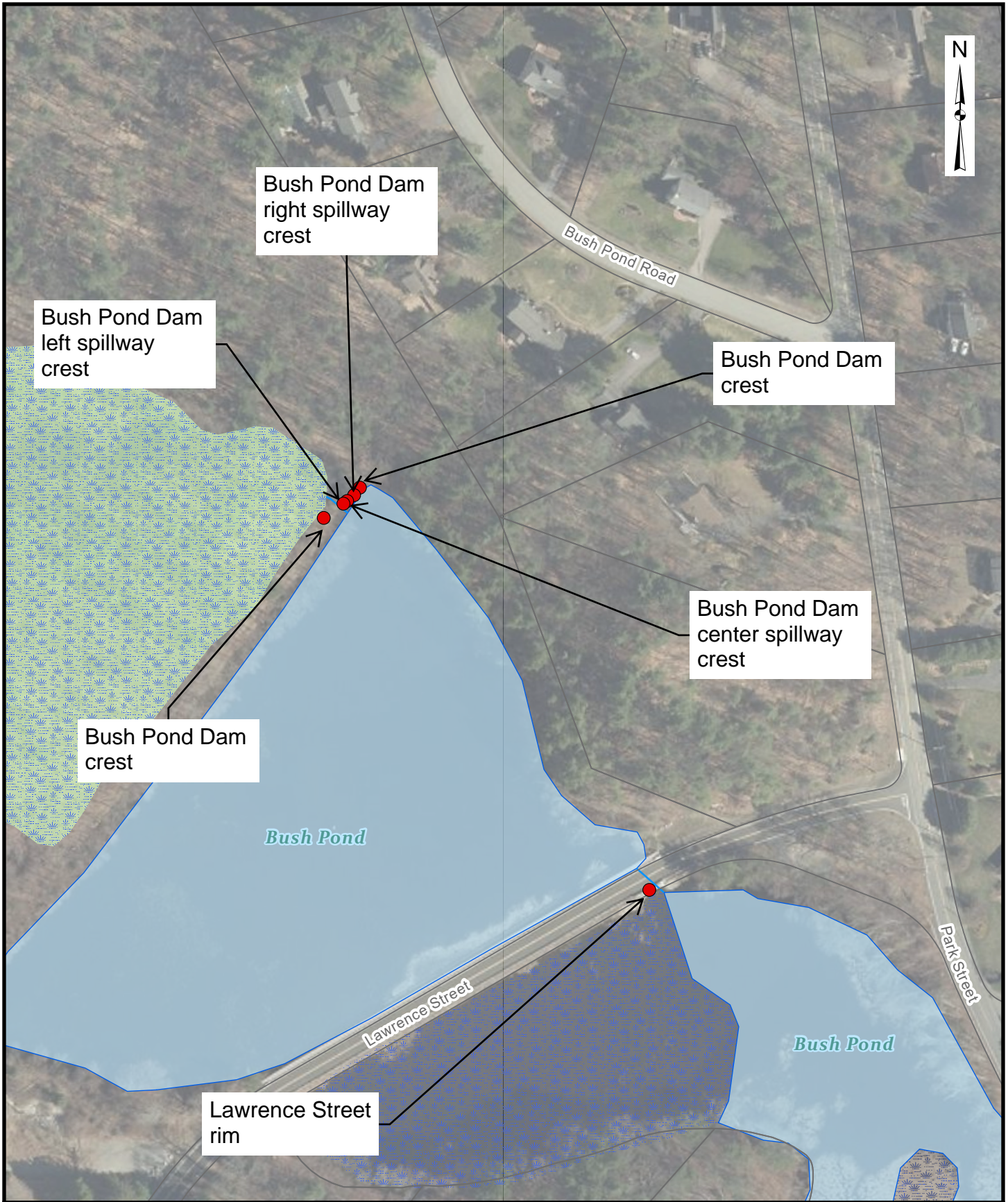
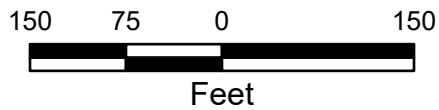


FIGURE 2 of 6
TOWNS OF NORFOLK AND WRENTHAM MASSACHUSETTS

● GPS Points



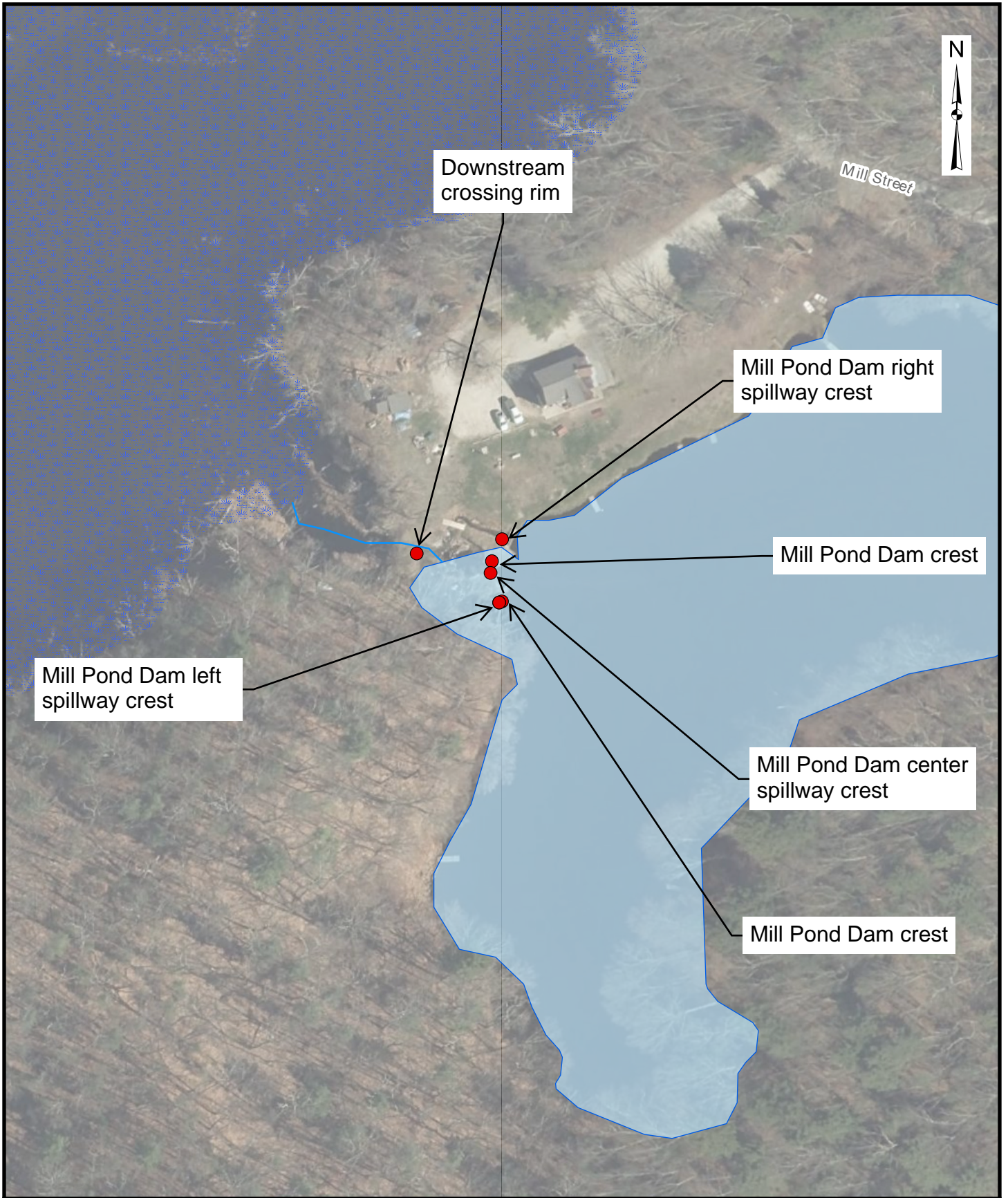


FIGURE 3 of 6
TOWNS OF NORFOLK AND WRENTHAM MASSACHUSETTS

● GPS Points

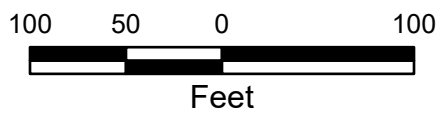
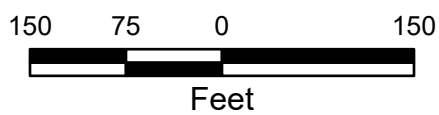




FIGURE 4 of 6
TOWNS OF NORFOLK AND WRENTHAM MASSACHUSETTS

● GPS Points



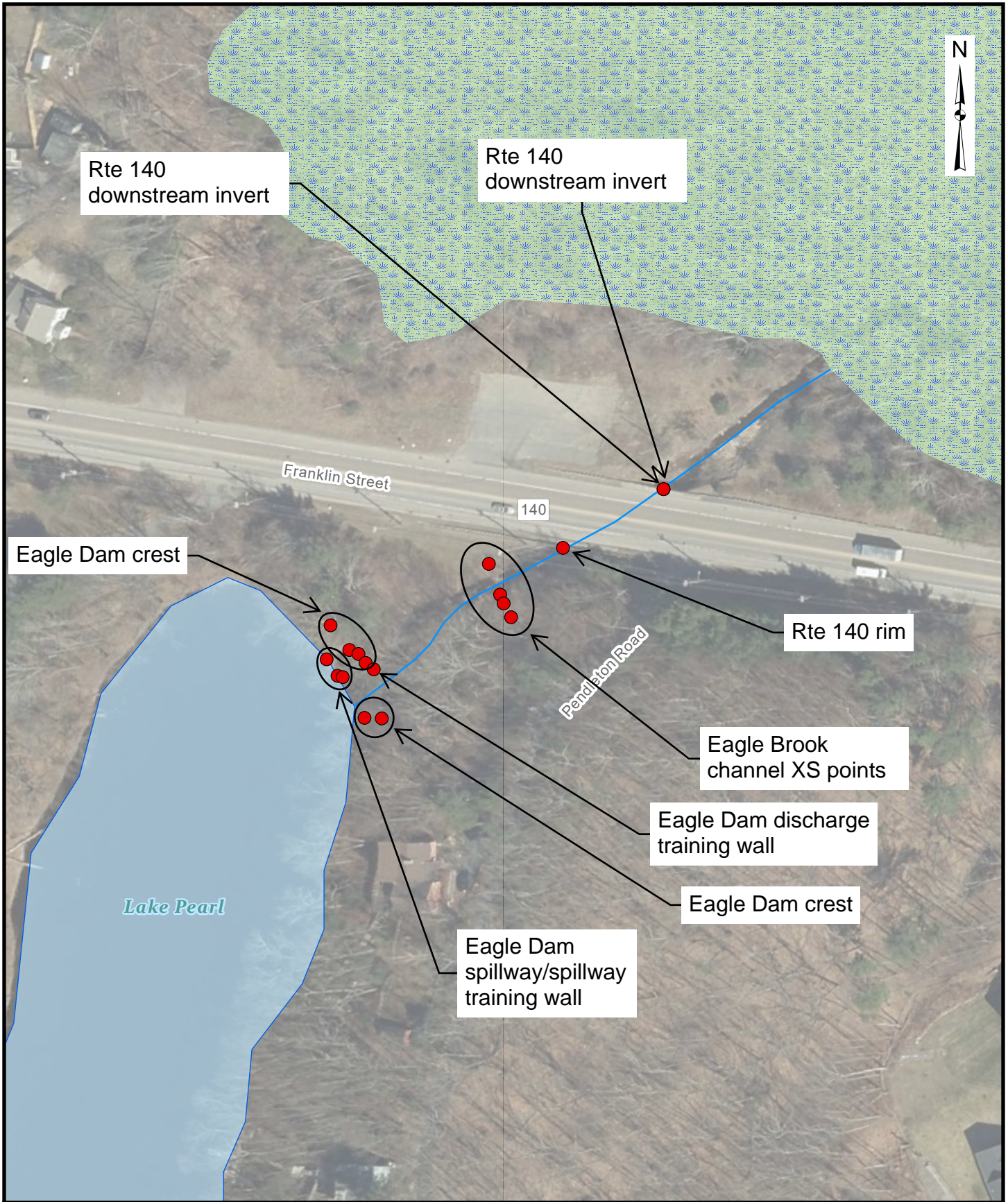
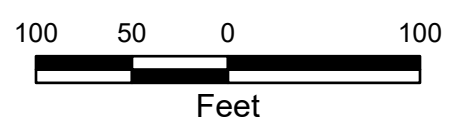


FIGURE 5 of 6
TOWNS OF NORFOLK AND WRENTHAM MASSACHUSETTS

● GPS Points





Red Dam crest

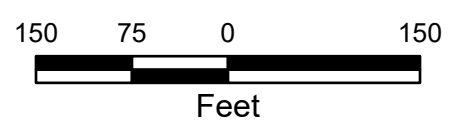


Gilmore Road

Lake Pearl

FIGURE 6 of 6
TOWNS OF NORFOLK AND WRENTHAM MASSACHUSETTS

● GPS Points



ATTACHMENT D: GPS DATA (ELECTRONIC)
PROVIDED UNDER SEPARATE COVER