ABBREVIATED NOTICE OF RESOURCE AREA DELINEATION

Filing Under the Massachusetts Wetlands Protection Act
M.G.L. Chapter 131, Section 40 and the Town of Pelham Wetlands Protection Bylaw

Tower Road Project
Tower Road
Pelham, Massachusetts

Submitted to:

Pelham Conservation Commission
Pelham Town Hall
351 Amherst Road
Pelham, Massachusetts 01002

Filed by:

W.D. Cowls, Inc.
134 Montague Road, P.O. Box 9677
North Amherst, Massachusetts 01059

Prepared by:

TRC Companies
650 Suffolk Street
Lowell, Massachusetts 01854

November 2020

TRC
650 Suffolk St., Suite 200
Lowell, MA 01854
T 978.970.5600
TRCcompanies.com

November 5, 2020

Town of Pelham Conservation Commission
Pelham Town Hall
351 Amherst Road
Pelham, MA 01002

RE: Tower Road Project
Tower Road, Pelham, MA
Abbreviated Notice of Resource Area Delineation (ANRAD)

Dear Commissioners:

TRC Companies (TRC) is writing on behalf of W.D. Cowls, Inc. to file an ANRAD for a parcel off Tower Road, Pelham, MA (Site) (Figure 1 in Attachment B). The Site is comprised of approximately 63.4 acres (listed by the Pelham tax assessor as Parcel ID 14-1).

TRC conducted a wetland and waterbody delineation survey on March 23, 25, and 26, 2020. This survey resulted in an overall delineation of three wetlands and two streams. The total linear feet of wetland edge and other resource areas delineated during the wetland and waterbody survey effort for the Site, the focus of this ANRAD filing, are summarized in the following table:

Resource Area	Delineated Length (linear feet)
Bordering Vegetated Wetland	688
Bank	682
Isolated Vegetated Wetland	360

Please refer to Attachment B for survey methodology, delineated wetland descriptions, US Army Corps of Engineers Wetland Determination forms, site photographs, and figures showing the resource areas.

To assist your review, we have provided the following attachments:

1. Attachment A – Abbreviated Notice of Resource Area Delineation Form & Wetland Fee Transmittal Form
2. Attachment B – Wetland and Waterbody Delineation Report
3. Attachment C – Abutter Information (Certified Abutter List)
4. Attachment D – Figure 1: Delineated Resources Map (November 2020)

Attachment B also includes the following figures:

Figure 1 – Project Location (April 2020)
Figure 2 – Wetland Delineation (November 2020)

We very much appreciate your review of this information. If you should have any questions, please do not hesitate to contact me at 978-656-3662 or via email at JBrandt@TRCcompanies.com.

Sincerely,

TRC Companies
Jeff Brandt
Jeff Brandt
Senior Project Manager

ATTACHMENT A
Abbreviated Notice of Resource Area Delineation Form & Wetland Fee Transmittal Form

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4A – Abbreviated Notice of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Pelham
City/Town

A. General Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. Project Location (**Note:** electronic filers will click on button for GIS locator):

Tower Road	Pelham	01002
a. Street Address	b. City/Town	c. Zip Code

Latitude and Longitude:

42.36656	-72.43025
d. Latitude	e. Longitude

14	1
f. Assessors Map/Plat Number	g. Parcel /Lot Number

2. Applicant:

a. First Name	b. Last Name

W.D. Cowls, Inc.
c. Organization

P.O. Box 9677
d. Mailing Address

North Amherst	MA	01059
e. City/Town	f. State	g. Zip Code

336-314-1702		eturner@ariespowersystems.com
h. Phone Number	i. Fax Number	j. Email Address

3. Property owner (if different from applicant):

☐ Check if more than one owner (attach additional sheet with names and contact information)

a. First Name	b. Last Name

c. Organization

d. Mailing Address

e. City/Town	f. State	g. Zip Code

h. Phone Number	i. Fax Number	j. Email Address

Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

4. Representative (if any):

Jeff	Brandt
a. Contact Person First Name	b. Contact Person Last Name

TRC
c. Organization

650 Suffolk Street
d. Mailing Address

Lowell	MA	01854
e. City/Town	f. State	g. Zip Code

978-656-3662		JBrandt@TRCcompanies.com
h. Phone Number	i. Fax Number	j. Email Address

Fees will be calculated for online users.

5. Total WPA Fee Paid (from attached ANRAD Wetland Fee Transmittal Form):

$2,000.00	$987.50	$1,012.50
a. Total Fee Paid	b. State Fee Paid	c. City/Town Fee Paid

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Pelham
City/Town

B. Area(s) Delineated

1. Bordering Vegetated Wetland (BVW) 688
Linear Feet of Boundary Delineated

2. Check all methods used to delineate the Bordering Vegetated Wetland (BVW) boundary:

a. ☐ MassDEP BVW Field Data Form (attached)

b. ☒ Other Methods for Determining the BVW boundary (attach documentation):

1. ☒ 50% or more wetland indicator plants
2. ☐ Saturated/inundated conditions exist
3. ☐ Groundwater indicators
4. ☒ Direct observation
5. ☒ Hydric soil indicators
6. ☐ Credible evidence of conditions prior to disturbance

3. Indicate any other resource area boundaries that are delineated:

Bank a. Resource Area	682 b. Linear Feet Delineated
Isolated Vegetated Wetland c. Resource Area	360 d. Linear Feet Delineated

C. Additional Information

Applicants must include the following plans with this Abbreviated Notice of Resource Area Delineation. See instructions for details. **Online Users:** Attach the Document Transaction Number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ ANRAD (Delineation Plans only)
2. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
3. ☒ Plans identifying the boundaries of the Bordering Vegetated Wetlands (BVW) (and/or other resource areas, if applicable).
4. ☒ List the titles and final revision dates for all plans and other materials submitted with this Abbreviated Notice of Resource Area Delineation.

D. Fees

The fees for work proposed under each Abbreviated Notice of Resource Area Delineation must be calculated and submitted to the Conservation Commission and the Department (see Instructions and Wetland Fee Transmittal Form).

1. ☐ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to the attached Wetland Fee Transmittal Form) to confirm fee payment:

1201084 2. Municipal Check Number	8/26/2020 3. Check date
1201082 4. State Check Number	8/26/2020 5. Check date
TRC 6. Payor name on check: First Name	7. Payor name on check: Last Name

E. Signatures

I certify under the penalties of perjury that the foregoing Abbreviated Notice of Resource Area Delineation and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

I hereby grant permission, to the Agent or member of the Conservation Commission and the Department of Environmental Protection, to enter and inspect the area subject to this Notice at reasonable hours to evaluate the wetland resource boundaries subject to this Notice, and to require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

I acknowledge that failure to comply with these certification requirements is grounds for the Conservation Commission or the Department to take enforcement action.

1. Signature of Applicant — 2. Date: Oct 20

3. Signature of Property Owner (if different) — 4. Date

5. Signature of Representative (if any) — 6. Date

For Conservation Commission:
Two copies of the completed Abbreviated Notice of Resource Area Delineation (Form 4A), including supporting plans and documents; two copies of the ANRAD Wetland Fee Transmittal Form; and the city/town fee payment must be sent to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Abbreviated Notice of Resource Area Delineation (Form 4A), including supporting plans and documents; one copy of the ANRAD Wetland Fee Transmittal Form; and a copy of the state fee payment must be sent to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery. (E-filers may submit these electronically.)

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

ANRAD Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Applicant Information

1. Location of Project:

Tower Road	Pelham
a. Street Address	b. City/Town
$987.50	1195225
c. Fee amount	d. Check number

2. Applicant:

		W.D. Cowls, Inc.
a. First Name	b. Last Name	c. Company

P.O. Box 9677
d. Mailing Address

North Amherst	MA	01059
e. City/Town	f. State	g. Zip Code

336-314-1702
h. Phone Number

3. Property Owner (if different):

a. First Name	b. Last Name	c. Company

d. Mailing Address

e. City/Town	f. State	g. Zip Code

h. Phone Number

B. Fees

The fee is calculated as follows for each Resource Area Delineation included in the ANRAD (check applicable project type). The maximum fee for each ANRAD, regardless of the number of Resource Area Delineations, is $200 activities associated with a single-family house and $2,000 for any other activity.

☐ **Online users:** check box if fee exempt.

Bordering Vegetated Wetland Delineation Fee:

1. ☐ single family house project	a. feet of BVW	x $2.00 =	b. Fee for BVW
2. ☒ all other projects	688 a. feet of BVW	$1,376 x $2.00 =	$1,376 b. Fee for BVW

Other Resource Area (e.g., bank, riverfront area, etc.):

3. ☐ single family house project	a. linear feet	x $2.00 =	b. Fee
4. ☒ all other projects	1,042 a. linear feet	$2,084 x $2.00 =	$624 (max. fee reached) b. Fee

Total Fee for all Resource Areas: $2,000
Fee

State share of filing fee: $987.50
5. 1/2 of total fee **less** $12.50

City/Town share of filing fee: $1,012.50
6. 1/2 of total fee **plus** $12.50

C. Submittal Requirements

a.) Send a copy of this form, with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts, to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Abbreviated Notice of Resource Area Delineation; a **copy** of this form; and the city/town fee payment.

c.) **To DEP Regional Office**: Send one copy of the Abbreviated Notice of Resource Area Delineation (and any additional documentation required as part of a Simplified Review Buffer Zone Project); a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

ATTACHMENT B
Wetland and Waterbody Delineation Report

Tower Road Project

Tower Road
Pelham, Massachusetts

Prepared By:

TRC
Wannalancit Mills
650 Suffolk Street
Lowell, Massachusetts 01854

Wetland and Waterbody Delineation Report

November 2020

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 REGULATORY AUTHORITY 1

- 2.1 United States Army Corps of Engineers 1
- 2.2 Massachusetts Department of Environmental Protection 2
- 2.3 Town of Pelham Conservation Commission 3

3.0 PROJECT SITE CHARACTERISTICS 3

- 3.1 Hydrology 3
  - 3.1.1 Floodplains 4
- 3.2 Federal and State Mapped Wetlands and Streams 4
- 3.3 Mapped Soils 4
  - 3.3.1 Hydric Rating 5
  - 3.3.2 Natural Drainage Class 5
  - 3.3.3 Prime Farmland 6
  - 3.3.4 Hydrologic Soil Groups 6

4.0 WETLAND AND STREAM DELINEATION METHODOLOGY 7

- 4.1 Non-wetland Aquatic Resource Methodology 7
- 4.2 Wetland Delineation Methodologies 7
  - 4.2.1 Hydrophytic Vegetation Methodologies 7
  - 4.2.2 Hydric Soil Methodologies 8
  - 4.2.3 Wetland Hydrology Methodologies 9

5.0 RESULTS 9

- 5.1 Upland Areas 9
- 5.2 Delineated Wetlands and Waterbodies 9
  - 5.2.1 Delineated Wetlands 9
  - 5.2.2 Delineated Waterbodies 10

6.0 CONCLUSIONS 11

7.0 REFERENCES 12

TABLES

Table 1: Mapped Soils 5
Table 2. Delineated Wetlands and Waterbodies.. 11

APPENDICES

Appendix A Figures

Figure 1. Project Location

Figure 2. Delineated Resources Map

Appendix B Photographs

Appendix C Wetland Determination Data Forms

Appendix D NRCS Soil Report

Appendix E USGS StreamStats Report

1.0 Introduction

This report presents the results of a wetland and waterbody delineation conducted on March 23 and 25, 2020 by TRC Companies, Inc. (TRC) off Tower Road in the Town of Pelham, Hampshire County, Massachusetts (Site). The survey included the 63.4-acre parcel listed by the Pelham Tax Assessor as Parcel ID 14-1.

The survey for wetlands and streams focused on the entire Site as well as adjacent parcels, when accessible, within 200 feet.

This report documents wetlands, streams, and other aquatic resources (ponds, lakes, impoundments, etc.) at the Site regardless of assumed jurisdictional status and addresses the implementation of local and state regulated buffer areas. To the extent practicable, the delineated resources were investigated to determine drainage patterns and a physical nexus to Waters of the United States (WOUS).

Appendix A provides a Site location map (Figure 1) and a map of the resources delineated by TRC (Figure 2). Appendix B includes representative photographs of the Site, Appendix C includes wetland determination data forms, and Appendix D contains the Natural Resources Conservation Service (NRCS) Soil Report. Appendix E contains the U.S. Geological Survey (USGS) StreamStats Reports.

2.0 Regulatory Authority

2.1 United States Army Corps of Engineers

In accordance with Section 404 of the Clean Water Act (CWA), the United States Army Corps of Engineers (USACE) asserts jurisdiction over WOUS, defined as wetlands, streams, and other aquatic resources under the regulatory authority per Title 33 Code of Federal Regulations (CFR) Part 328, and the United States Environmental Protection Agency (EPA) per Title 40 CFR Part 230.3(s). Wetlands are defined as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (EPA, 2019).

The USACE will assert jurisdiction over the following waters:

- Traditional navigable waters;
- Wetlands adjacent to traditional navigable waters;
- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and
- Wetlands that directly abut such tributaries.

The USACE will decide jurisdiction over the following waters based on analysis to determine whether they have significant nexus with a traditional navigable water:

- Non-navigable tributaries that are not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and
- Wetlands adjacent to, but that do not directly abut, a relatively permanent non-navigable tributary.

The USACE generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); and
- Ditches (including roadside ditches) excavated wholly in and draining only uplands, and that do not carry a relatively permanent flow of water.

The USACE will apply the significant nexus standard as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream traditional navigable waters; and
- Significant nexus includes consideration of hydrologic and ecologic factors.

The USACE also regulates navigable waters under Section 10 of the Rivers and Harbor Act (33 U.S.C. 401 et seq.), which requires that a permit must be issued by the USACE to construct any structure in or over any navigable WOUS, as well as any proposed action (such as excavation/dredging or deposition of materials) that would alter or disturb these waters. If the proposed structure or activity affects the course, location, condition, or capacity of the navigable water, even if the proposed activity is outside the boundaries of the stream in associated wetlands, a Section 10 permit from the USACE is required.

2.2 Massachusetts Department of Environmental Protection

The Massachusetts Wetlands Protection Act (WPA) (Section 40 of Chapter 131 of the General Laws of Massachusetts and regulated under 310 Code of Massachusetts Regulations [CMR] section 10.00) defines multiple coastal (310 CMR 10.25-10.37) and inland resource areas (310 CMR 10.54-10.59) and gives the Massachusetts Department of Environmental Protection (MassDEP) jurisdiction over these resource areas. In most cases, the WPA also gives MassDEP jurisdiction over buffer zone extending 100 feet from the edge of the resource area. In addition to MassDEP, local municipalities' Conservation Commissions are responsible for administering the WPA and any local wetlands ordinance or bylaw.

The WPA defines two types of Land Subject to Flooding (310 CMR 10.57): isolated and bordering. Isolated Land Subject to Flooding (ILSF) is defined as "an isolated depression or a closed basin which serves as a ponding area for run-off or high ground water which has risen above the ground surface." Bordering Land Subject to Flooding (BLSF) is defined as "an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland." The boundary of BLSF is further defined as "the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm" as shown on the most recently available flood profile data prepared for the community by the National Flood Insurance Program (NFIP), currently administered by the Federal Emergency Management Agency (FEMA), successor to the U.S. Department of Housing and Urban Development). Under the WPA, ILSF and BLSF do not have associated buffer zones.

The WPA defines Bordering Vegetated Wetland (BVW) under 310 CMR 10.55 as any freshwater wetland which borders on creeks, rivers, stream ponds or lakes. Under the WPA, a 100-foot buffer zone is associated with BVWs. Isolated wetlands (IWs) are not connected to a waterway or waterbody and, therefore, are not regulated under the WPA and do not have an associated buffer zone under the WPA. IWs may have an associated buffer zone or similar zone associated with them under the local ordinance or bylaw. In some cases, IWs may qualify as ILSF and, in those instances, are regulated under the WPA.

The WPA defines Bank (310 CMR 10.54) as the portion of the land surface which normally abuts and confines a waterbody, occurring between a waterbody and a BVW and adjacent floodplain, or between a waterbody and an upland. Under the WPA, a 100-foot buffer zone is associated with Banks.

The WPA defines Riverfront Area (310 CMR 10.58) as the 200-foot area of land measured horizontally from a river's Mean Annual High Water (MAHW) line. The section defines a river as any stream that is perennial and includes, but is not limited to, streams shown as perennial on current USGS maps or that have a watershed size greater than or equal to one square mile. Riverfront Area is not associated with intermittent streams as they do not flow throughout the year. Under the WPA, Riverfront Area does not have an associated buffer zone.

A Notice of Intent filing is required from the MassDEP for any disturbance, including the removal of vegetation or alteration to a Banks, BVW, ILSF, BLSF, Riverfront Area, or buffer zone.

2.3 Town of Pelham Conservation Commission

The Pelham Conservation Commission (PCC) administers a local wetlands bylaw and regulations in addition to the WPA. The PCC has jurisdiction over any freshwater wetland, marsh, wet meadow, bog, swamp, isolated wetland, lake, pond, river, and stream (surface or subsurface) and land within 100 feet of any of these areas. The PCC does not have a minimum size for isolated wetlands. The PCC also has jurisdiction over land under waterbodies and land subject to flooding or inundation by groundwater, surface water, storm flowage, or within 100 feet of the 100-year floodplain.

3.0 Project Site Characteristics

TRC reviewed publicly available literature and materials used for the investigation, survey, and report preparation, including:

- MassGIS OLIVER[1], the National Hydrography Dataset;
- The Belchertown, Massachusetts 7.5 Minute Quadrangle (USGS, 2018);
- The FEMA Flood Insurance Rate Map (FIRM) Panel 250168A (effective date December 10, 1976);
- The U.S. Fish and Wildlife Service (USFWS), National Wetlands Inventory (NWI);
- The U.S. Department of Agriculture (USDA), NRCS Web Soil Survey;
- Recent aerial orthoimagery.

The following sections summarize TRC's review of each of these resources.

3.1 Hydrology

The Site is gently sloping with some steep slopes in the southeastern portion. The Site generally drains westward beyond the survey area to wetlands and tributaries to Harris Brook to the northwest and to Scarboro Pond to the south.

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[1] The MassDEP Wetlands Conservancy Program uses aerial photography and photo interpretation to delineate and map wetland boundaries. These boundaries are available via the Massachusetts Office of Geographic Information (MassGIS) online mapping tool, OLIVER. Desktop review consisted of utilizing MassGIS OLIVER to gather a general understanding of existing conditions and potential regulated resource areas.

3.1.1 Floodplains

Flood hazard areas identified on the FEMA's FIRMs are identified as Special Flood Hazard Areas (SFHAs). SFHAs are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. FEMA uses a variety of labels for SFHAs:

Zone A
Zone AO
Zone AH
Zones A1-A30
Zone AE
Zone A99
Zone AR
Zone AR/AE
Zone AR/AO
Zone AR/A1-A30
Zone AR/A
Zone V
Zone VE, and
Zones V1-V30

Moderate flood hazard areas, labeled Zone B or Zone X (shaded on FEMA mapping) are also shown on the FIRM, and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are labeled Zone C or Zone X (unshaded on FEMA mapping).

According to the FEMA FIRM 250168A (effective date December 10, 1976), the Site is located within a Zone C area of minimal flood disturbance zone. Base flood elevations and flood hazard factors are not available for this area.

3.2 Federal and State Mapped Wetlands and Streams

The USFWS is the principal federal agency tasked with providing information to the public on the status and trends of wetlands on a national scale. The USFWS NWI is a publicly available resource that provides detailed information on the abundance, characteristics, and distribution of nationwide wetlands (where mapped). NWI mapping data is offered to promote the understanding, conservation, and restoration of wetlands. The online MassGIS OLIVER mapping tool was accessed to determine the extent of state-mapped aquatic resources.

According to TRC's review of MassGIS OLIVER mapping, NWI does not map any wetlands onsite and MassDEP maps one wetland and one stream onsite. The MassDEP wetland is located along the northwest boundary of the Site. The MassDEP stream is an unnamed intermittent stream along the center of the western Site boundary.

3.3 Mapped Soils

The NRCS's Web Soil Survey identifies six soil map units within the Site. Map units can represent a type of soil, a combination of soils, or miscellaneous land cover types (e.g., water, rock outcrop, developed impervious surface). Map units are usually named for the predominant soil series or land types within the map unit. A summary of soil characteristics for soils mapped at the Site are included in Table 1, below. The following sections provide details about hydric ratings, drainage class, prime farmland, and hydrologic soil groups (HSGs). Details about soil map unit descriptions are provided in the NRCS Soil Report included as Appendix D.

Table 1: Mapped Soils

Symbol	Soil Name	Hydric Rating (%)	Drainage Class	Hydrologic Soil Group	Farmland Classification
316B	Scituate fine sandy loam, 3 to 8 percent slopes, very stony	4	Moderately well drained	C/D	Farmland of statewide importance
441B	Gloucester gravelly fine sandy loam, 3 to 8 percent slopes, very stony	2	Somewhat excessively drained	A	Farmland of statewide importance
441C	Gloucester gravelly fine sandy loam, 8 to 15 percent slopes, very stony	1	Somewhat excessively drained	A	Farmland of statewide importance
442B	Gloucester gravelly fine sandy loam, 3 to 8 percent slopes, extremely stony	3	Somewhat excessively drained	A	Not prime farmland
442C	Gloucester gravelly fine sandy loam, 8 to 15 percent slopes, extremely stony	1	Somewhat excessively drained	A	Not prime farmland
442D	Gloucester gravelly fine sandy loam, 15 to 25 percent slopes, extremely stony	0	Somewhat excessively drained	A	Not prime farmland

3.3.1 Hydric Rating

The *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) (1987 Manual) defines a hydric soil as "…a soil that in its undrained condition, is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation."

Due to limitations imposed by the small scale of the soil survey mapping, it is not uncommon to identify wetlands within areas not mapped as hydric soil while areas mapped as hydric often do not support wetlands. This concept is emphasized by the NRCS:

> *Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.*

Hydric Soil Rating (HSR) indicates the percentage of a map unit that meets the criteria for hydric soils.

Map unit 316B has an HSR of 4 percent, map unit 442B has an HSR of 3 percent, map unit 441B has an HSR of 2 percent, map units 441C and 442C have an HSR of 1 percent, and map unit 442D has an HSR of 0 percent. For map units 316B, 442B, 441B, 441C, and 442C, the hydric component within these map units is Ridgebury.

3.3.2 Natural Drainage Class

Natural drainage class refers to the frequency and duration of wet periods under conditions similar to those under which the soil developed. Anthropogenic alteration of the water regime, either through drainage or irrigation, is not a consideration unless the alterations have significantly changed the morphology of the soil.

Map unit 316B is rated as moderately well drained. is the remaining map units (441B, 441C, 442B, 442C, and 442D) are rated as somewhat excessively drained.

3.3.3 Prime Farmland

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses (the land could be cropland, pastureland, rangeland, forestland, or other land, but not urban built-up land or water). Land used for a specific high-value food or fiber crop is classified as “unique farmland.” Generally, additional “farmlands of statewide importance” include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. In some local areas, there is concern for certain additional farmlands, even though these lands are not identified as having national or statewide importance. These farmlands are identified as being of “local importance” through ordinances adopted by local government. The NRCS State Conservationist reviews and certifies lists of farmland of state and local importance. These lists, along with state and locally established Land Evaluation and Site Assessment (LESA) systems where applicable, are used by federal agencies to review and evaluate activities that may impact farmland. As defined in 7 CFR Part 657, important farmland encompasses prime and unique farmland, as well as farmland of statewide and local importance.

According to the NRCS, map units 316B, 441B, and 441C are classified as “farmland of statewide importance” and map units 442B, 442C, and 442D are classified as “not prime farmland.”

3.3.4 Hydrologic Soil Groups

Soils are assigned to a HSG based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

> Group A: Soils have a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
>
> Group B: Soils have a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
>
> Group C: Soils have a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
>
> Group D: Soils have a very slow infiltration rate (high runoff potential) when thoroughly wet. Soils consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition in Group D are assigned to dual classes.

Map unit 316B is in the dual HSG C/D. Map units 441B, 441C, 442B, 442C, and 442D are in HSG A.

4.0 Wetland and Stream Delineation Methodology

In addition to the desktop review described in Section 3.0, TRC biologists performed field investigations at the Site to identify wetlands, waterbodies, and other surface waters on March 23 and 25, 2020.

4.1 Non-wetland Aquatic Resource Methodology

Streams and other non-wetland aquatic features within the Site were identified by the presence of an OHWM, which is the line established by the fluctuations of water (33 CFR 328.3). The OHWM line is indicated by physical characteristics, which can include: a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other characteristics of the surrounding areas. Each stream bank was delineated with blue flagging. Flags were located with a handheld global positioning system (GPS) unit and the data post-processed to achieve sub-meter accuracy.

4.2 Wetland Delineation Methodologies

The delineation of wetlands was conducted in accordance with criteria set forth in the 1987 Manual, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (USACE, 2012) (Supplement), and the *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act- A Handbook* (MassDEP, 1995) (the MassDEP Handbook).

The three-parameter approach to identify and delineate wetlands presented in the 1987 Manual and the Supplement requires that, except for atypical and disturbed situations, wetlands possess hydrophytic vegetation, hydric soils, and wetland hydrology. A two-parameter approach that considers only vegetation and hydrology indicators is presented in the MassDEP Handbook. Per the MassDEP Handbook, hydric soil is included as evidence of wetland hydrology.

Wetland boundary flags were located with a handheld GPS unit and the data were post-processed to achieve sub-meter accuracy. Delineated resources were classified in accordance with the system presented in *The Classification of Wetlands and Deepwater Habitats of the United States, Second Edition* (Federal Geographic Data Committee, 2013).

4.2.1 Hydrophytic Vegetation Methodologies

Hydrophytic vegetation is defined in the 1987 Manual as:

> …the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present.

Plants are categorized according to their occurrence in wetlands. Scientific names and wetland indicator statuses for vegetation are those listed in *The National Wetland Plant List: 2016 Wetland Ratings* (NWPL) (Lichvar et al., 2016). The indicator statuses specific to the “Northcentral and Northeast Region” as defined by the USACE apply to the Site. For upland species that are not listed on the NWPL, the Integrated

Taxonomic Information System was referenced for currently accepted scientific names. The official short definitions for wetland indicator statuses are as follows:

- Obligate Wetland (OBL): Almost always occur in wetlands;
- Facultative Wetland (FACW): Usually occur in wetlands, but may occur in non-wetlands;
- Facultative (FAC): Occur in wetlands and non-wetlands (50/50 mix);
- Facultative Upland (FACU): Usually occur in non-wetlands, but may occur in wetlands; and
- Upland (UPL): Almost never occur in wetlands.

Plants that are not found in a region, but are found in an adjacent region, take on the indicator status of that adjacent region for dominance calculations. Plants that are included on the NWPL, but not within the Site region or an adjacent region, are not included in dominance calculations. Plants that are not found in wetlands in any region are considered “UPL” for dominance calculations.

Vegetation community sampling was accomplished using the methodologies outlined in the 2012 Supplement. The “50/20 rule” was applied to determine whether a species was dominant in its stratum. In using the 50/20 rule, the plants that comprise each stratum are ranked from highest to lowest in percent cover. The species that cumulatively equal or exceed 50 percent of the total percent cover for each stratum are dominant species, and any additional species that individually provides 20 percent or more percent cover is also considered dominant species of its respective strata.

A hydrophytic vegetation community is present when: 1) all of the dominant species are FACW and/or OBL (Rapid Test for Hydrophytic Vegetation); 2) greater than 50 percent of the dominant species’ (as determined by the 50/20 rule) indicator statuses are FAC, FACW, or OBL (Dominance Test); and/or 3) when the calculated Prevalence Index is equal to or less than 3.0. When applying the Prevalence Index, all plants are assigned a numeric value based on indicator status (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5) and their abundance (absolute percent cover) is used to calculate the prevalence index.

Cover types are also assigned to each wetland and waterbody in accordance with the system presented in *The Classification of Wetlands and Deepwater Habitats of the United States, Second Edition* (Federal Geographic Data Committee, 2013).

4.2.2 Hydric Soil Methodologies

Hydric soil indicators described in *Field Indicators for Identifying Hydric Soils in New England, Version 4* (New England Hydric Soils Technical Committee, 2017) and in *Field Indicators of Hydric Soils in the United States, Version 8.2* (NRCS, 2018) were used to determine the presence of characteristic soil morphologies resulting from prolonged saturation and/or inundation. Soil color was described using standard color notations provided on Munsell® soil color charts (X-Rite, Inc., 2015). Soil texture was determined using the methods described by Thien (1979). Soil test pits were dug using a spade shovel to a depth of approximately 20 inches or more (if needed).

Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin (MLRA Handbook) (USDA NRCS, 2006) was referenced to determine the hydric soil indicators that apply to the Site. Per the MLRA Handbook, the Site is within Major Land Resource Area (MLRA) 144A (New England and Eastern New York Upland, Southern Part) of Land Resource Region (LRR) R (Northeastern Forage and Forest Region). Hydric soil indicators that do not apply to this MLRA were not considered on the wetland determination data forms.

The presence or absence of hydric soils was determined through examination of samples extracted with a hand shovel or hand auger from the upper horizons of the soil profile. Soils were examined to depths of approximately 18 to 20 inches, unless restrictive layers such as hard pan, rock, densely packed fill materials, etc. were encountered at shallower depths.

4.2.3 Wetland Hydrology Methodologies

Per the 1987 Manual:

> *The term "wetland hydrology" encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and reducing conditions, respectively. Such characteristics are usually present in areas that are inundated or have soils that are saturated to the surface for sufficient duration to develop hydric soils and support vegetation typically adapted for life in periodically anaerobic soil conditions. Hydrology is often the least exact of the parameters, and indicators of wetland hydrology are sometimes difficult to find in the field. However, it is essential to establish that a wetland area is periodically inundated or has saturated soils during the growing season.* (Environmental Laboratory, 1987)

Wetland hydrology indicators are grouped into 18 primary and 11 secondary indicators presented in the Supplement. The USACE considers wetland hydrology to be present when at least one primary indicator or two secondary indicators are identified.

5.0 Results

5.1 Upland Areas

The upland areas consist of successional forests throughout most the Site. The dominant vegetation in the uplands consists of eastern hemlock (*Tsuga canadensis*), northern red oak (*Quercus rubra*), red maple (*Acer rubrum*), yellow birch (*Betula alleghenensis*), eastern white pine (*Pinus strobus*), mountain laurel (*Kalmia latifolia*), late lowbush blueberry (*Vaccinium angustifolium*), cinnamon fern (*Osmundastrum cinnamomeum*), tree groundpine (*Dendrolycopodium dendroideum*), and partridgeberry (*Mitchella repens*). The terrain of the Site is gently sloping to the northwest. The soils observed throughout upland portions of the Site were generally classified as silt loam or loamy sand.

5.2 Delineated Wetlands and Waterbodies

TRC identified three wetlands and two waterbodies within the Site during the March 2020 resource delineation effort (Figure 2 in Appendix A). Delineated areas are described in the following sections and summarized at the end of this section in Table 2. Refer to the photographs in Appendix B and the wetland determination data forms in Appendix C for further details about each delineated area.

5.2.1 Delineated Wetlands

Wetland W-1 is a palustrine forested (PFO) wetland associated with stream S-1. This wetland is located along the northern edge of the Site and extends off-site to the north and west. The dominant vegetation included yellow birch, green ash (*Fraxinus pennsylvanica*), red maple, and threeleaf goldthread (*Coptis trifolia*). Indicators of wetland hydrology included high water table, saturation, drainage patterns, moss trim lines, microtopic relief and FAC-neutral test. Soils were composed of a thick layer of dark organic muck underlain by sandy loam. This soil meets Hydric Soil Indicator A11 as described in *Field Indicators of Hydric Soils in the United States, Version 8.2* (Field Indicators) (USDA NRCS, 2018). ***This wetland is PCC and MassDEP jurisdictional and it also falls under USACE jurisdiction, as it is likely connected to other WOUS.***

Wetland W-2 is an isolated PFO wetland. This wetland is located along the western Site boundary and extends off-site to the west. The dominant vegetation included red maple, cinnamon fern, and sphagnum moss (*Sphagnum spp*.).. Indicators of wetland hydrology included surface water, saturation, water-stained leaves, drainage patterns, geomorphic position, microtopographic relief, and FAC-neutral test. Soils were composed of a layer of hemic muck over dark gray silt loam. This soil meets Hydric Soil Indicator A11 as described in *Field Indicators of Hydric Soils in the United States, Version 8.2* (Field Indicators) (USDA NRCS, 2018. This wetland has a delineated area of 7,582 square feet. Based on the vegetation and soil conditions, this wetland may be inundated during non-drought conditions. A standing water depth of between 15 and 18 inches would result in the ¼ acre-feet volume required to meet the ILSF definition at 310 CMR 10.57(2)(b)(1). ***This wetland is PCC jurisdictional as an isolated wetland and may be MassDEP jurisdictional as ILSF. It likely does not fall under USACE jurisdiction, as it is not connected to other WOUS.***

Wetland W-3 is a PFO wetland associated with S-2. This wetland is located along the western edge of the Site. The dominant vegetation included red maple, eastern white pine, yellow birch, mountain laurel, and sphagnum moss. Indicators of wetland hydrology included surface water, high water table, saturation, water-stained leaves, drainage patterns, moss trim lines, and geomorphic position. Soils were composed of a layer of dark sapric muck over dark gray loamy sand on top of rock. This soil meets Hydric Soil Indicator A11 as described in *Field Indicators of Hydric Soils in the United States, Version 8.2* (Field Indicators) (USDA NRCS, 2018). ***This wetland is PCC and MassDEP jurisdictional and it also falls under USACE jurisdiction, as it is likely connected to other WOUS.***

5.2.2 Delineated Waterbodies

Stream S-1 is an intermittent stream (R4, NWI classification) that flows westward immediately north of the northern boundary of the Site. This stream continues westward off-site. The streambed was comprised of organic material. TRC observed an average width of approximately 10 feet. Stream S-1 has defined banks such that the OHWM and the banks are coincident. The OHWM was delineated on both sides of the stream.

The USGS does not map stream S-1. The USGS StreamStats analysis in Appendix E shows that it has a watershed that is less than 0.5 square miles. Therefore, this stream is considered intermittent. ***This stream is PCC and MassDEP jurisdictional and falls under USACE jurisdiction, as it is likely connected to other WOUS.***

Stream S-2 is an intermittent stream (R4) that flows westward toward the center of the west Site boundary. This stream extends off-site to the west. The streambed was comprised of sand and gravel. TRC observed an average width of approximately 10 feet. Stream S-2 has defined banks such that the OHWM and the banks are coincident. The OHWM was delineated on one side of the stream.

The USGS does not map stream S-2. The USGS StreamStats analysis in Appendix E shows that it has a watershed that is less than 0.5 square miles. Therefore, this stream is considered intermittent. ***This stream is PCC and MassDEP jurisdictional and falls under USACE jurisdiction, as it is likely connected to other WOUS.***

Table 2. Delineated Wetlands and Waterbodies

Wetland Field Designation	Field Designated NWI Classification [1]	Assumed Jurisdictional Status	Assumed Buffer/ Setback Requirements
W-1	PFO	USACE/MassDEP/Local	100-ft buffer zone
W-2	PFO	MassDEP/Local	100-ft buffer zone
W-3	PFO	USACE/MassDEP/Local	100-ft buffer zone
S-1	R4	USACE/MassDEP/Local	100-ft buffer zone
S-2	R4	USACE/MassDEP/Local	200-ft Riverfront Area

[1] *The Classification of Wetlands and Deepwater Habitats of the United States, Second Edition* (Federal Geographic Data Committee, 2013). Categories include: Palustrine Forested (PFO), and Riverine Intermittent (R4).

6.0 Conclusions

It is TRC's opinion that delineated wetlands W-1 and W-3 are BVWs regulated by the PCC and MassDEP and are also likely under USACE jurisdiction. W-2 is an isolated wetland regulated by the PCC and may be regulated as ILSF by MassDEP. W-2 likely does not fall under USACE jurisdiction. There are no buffers or setbacks associated with USACE-regulated wetlands. However, there is a 100-foot buffer zone associated with MassDEP- and PCC-regulated wetlands.

Intermittent streams S-1 and S-2 are USACE jurisdictional, as they are hydrologically connected to WOUS. There streams are also regulated by the PCC and MassDEP, as they flow within, into, or out of a MassDEP-regulated wetland resource area.

Final determination of jurisdictional status for on-site wetlands and waterbodies must be made by the regulators.

7.0 References

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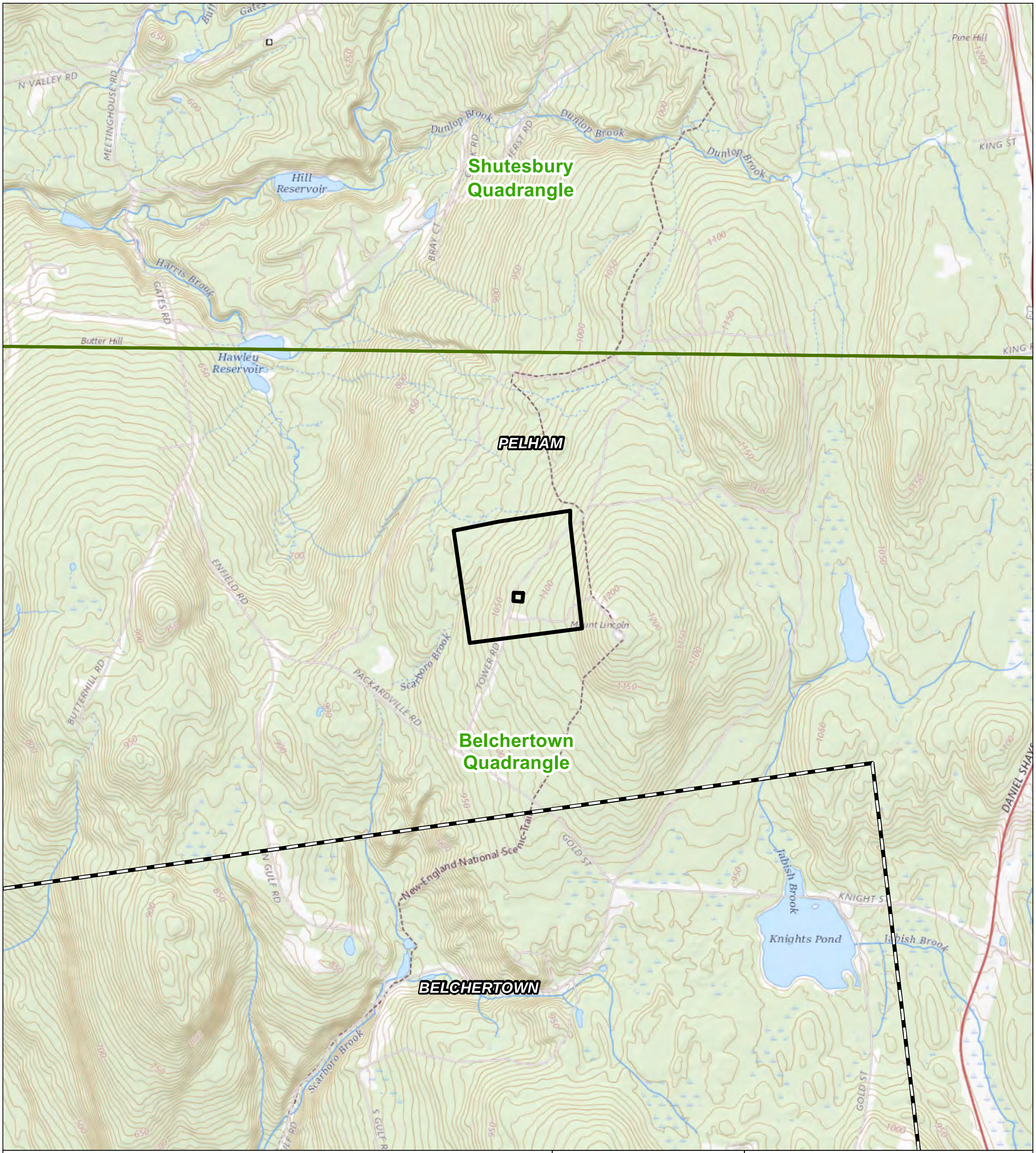
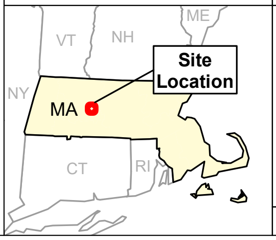
Appendix A: Figures



- ▭ Project Area
- 🟩 USGS 24k Quadrangle
- ▭ Town Boundary

0 1,000 2,000
Feet

Data Sources: TRC, MassGIS, Esri
Base Map: The National Map, "USGSTopo" Service Layer



TRC

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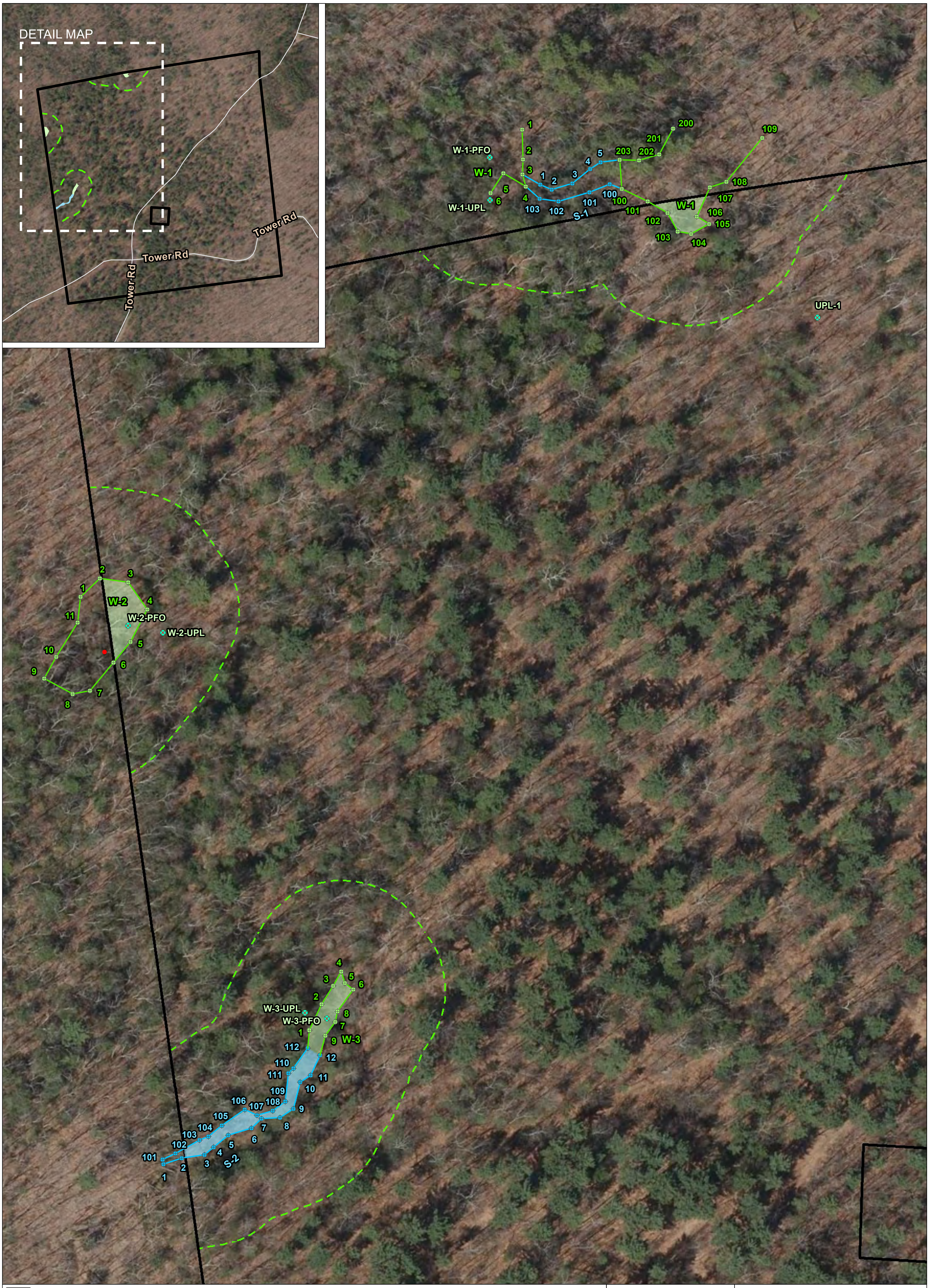
PROJECT LOCATION

TOWER ROAD
PELHAM, MA

FIGURE 1	APRIL 2020

S:\1-PROJECTS\AMP\387920_TowerHill\5-MXD\Fig 1 TowerHill_USGS_8x11.mxd



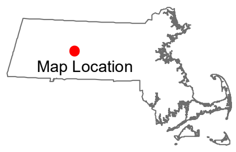
▭ Project
⌖ Stream Flag
⌖ Wetland Flag
⊗ USACE Plot
— Delineated Intermittent
🟦 Delineated Stream
— Delineated Wetland
🟩 Delineated Wetland
● Potential Vernal Pool Flag
- - 100-ft Wetland Buffer

N

0 50 100
Feet

Data: TRC 2020
Base map: USGS Color Ortho Imagery, MassGIS 2019

MASSACHUSETTS



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DELINEATED RESOURCES

ASD TOWER MA SOLAR LLC
TOWER ROAD
PELHAM, MA

FIGURE 4 NOVEMBER 2020

S:\1-PROJECTS\AMP\387920_TowerHill\5-MXD\Fig 2 TowerHill_Delineation11x17_20201105.mxd

Appendix B: Photographs

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

Photograph: 1

Date: 3/25/2020

Direction: Southeast

Description:

Representative conditions observed within uplands near data plot UPL-2.

Photograph: 2

Date: 3/25/2020

Direction: East

Description:

Representative conditions observed looking upstream within stream S-1.

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

Photograph: 3

Date: 3/25/2020

Direction: Northeast

Description:

Representative conditions observed looking upstream within stream S-2.

Photograph: 4

Date: 3/25/2020

Direction: Northwest

Description:

Representative conditions observed within wetland W-1.

TOWER ROAD PROJECT

PELHAM, MASSACHUSETTS

Photograph: 5

Date: 3/25/2020

Direction: West

Description:

Representative conditions observed within wetland W-2.

Photograph: 6

Date: 3/25/2020

Direction: West

Description:

Representative conditions observed within wetland W-3.

Appendix C: Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Tower Hill **City/County:** Pelham, Hampshire **SamplingDate:** 2020-Mar-25
Applicant/Owner: Cowls W.D., Inc. **State:** MA **SamplingPoint:** UPL-1
Investigator(s): Kevin Ferguson, Greg Russo **Section, Township, Range:** NA
Landform (hillslope, terrace, etc.): Depression **Local relief (concave, convex, none):** Concave **Slope (%):** 1 to 3
Subregion (LRR or MLRA): LRR R **Lat:** 42.3678783524 **Long:** -72.429040086 **Datum:** WGS84
Soil Map Unit Name: Gloucester gravelly fine sandy loam, 3 to 8 percent slopes, very stony **NWI classification:** None
Are climatic/hydrologic conditions on the site typical for this time of year? Yes _✓_ No ____ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes _✓_ No ____
Are Vegetation ___, Soil ___, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _✓_ No ____
Hydric Soil Present? Yes ____ No _✓_
Wetland Hydrology Present? Yes _✓_ No ____

Is the Sampled Area within a Wetland? **Yes ____ No _✓_**
If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report)
Covertype is UPL. Area is upland, not all three wetland parameters are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- _✓_ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- _✓_ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ____ No _✓_ Depth (inches): ______
Water Table Present? Yes ____ No _✓_ Depth (inches): ______
Saturation Present? Yes _✓_ No ____ Depth (inches): 0
(includes capillary fringe)

Wetland Hydrology Present? Yes _✓_ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The criteria for wetland hydrology is met.

VEGETATION -- Use scientific names of plants.

Sampling Point: UPL-1

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	35	Yes	FACU
2. *Acer rubrum*	30	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	65	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Betula alleghaniensis*	15	Yes	FAC
2. *Acer rubrum*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	25	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Osmundastrum cinnamomeum*	5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	80	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply By:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	55	x 3 =	165
FACU species	35	x 4 =	140
UPL species	0	x 5 =	0
Column Totals	95	(A)	315 (B)

Prevalence Index = B/A = 3.3

Hydrophytic Vegetation Indicators:

_____ 1- Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
_____ 3 - Prevalence Index is ≤ 3.0[1]
_____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

SOIL

Sampling Point: UPL-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 2	10YR 2/2	100					Silt Loam	
2 - 6	10YR 4/3	40	10YR 3/1	30			Clay Loam	
			10YR 4/2	28			Clay Loam	
			10YR 5/6	2	C	M	Clay Loam	
6 - 14	10YR 4/4	70	10YR 5/4	30			Silty Clay	

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**
___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock
Depth (inches): 15

Hydric Soil Present? Yes ____ No ✓

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Tower Hill **City/County:** Pelham, Hampshire **Sampling Date:** 2020-Mar-23
Applicant/Owner: Cowls W.D., Inc. **State:** MA **Sampling Point:** W-1-PFO
Investigator(s): Kevin Ferguson, Greg Russo **Section, Township, Range:** NA
Landform (hillslope, terrace, etc.): Depression **Local relief (concave, convex, none):** Concave **Slope (%):** 0 to 1
Subregion (LRR or MLRA): LRR R **Lat:** 42.3683485073 **Long:** -72.4303719085 **Datum:** WGS84
Soil Map Unit Name: Scituate fine sandy loam, 3 to 8 percent slopes, very stony **NWI classification:** PFO
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____		
Hydric Soil Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?**	**Yes ✓ No ____**
Wetland Hydrology Present?	Yes ✓ No ____	**If yes, optional Wetland Site ID:**	W-1-PFO

Remarks: (Explain alternative procedures here or in a separate report)
Covertype is PFO. Area is wetland, all three wetland parameters are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
✓ High Water Table (A2)
✓ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
✓ Drainage Patterns (B10)
✓ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
✓ Microtopographic Relief (D4)
✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No ✓	Depth (inches):		
Water Table Present?	Yes ✓ No ____	Depth (inches):	5	**Wetland Hydrology Present?** Yes ✓ No ____
Saturation Present? (includes capillary fringe)	Yes ✓ No ____	Depth (inches):	0	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The criteria for wetland hydrology has been met..

VEGETATION -- Use scientific names of plants.

Sampling Point: W-1-PFO

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Betula alleghaniensis*	10	Yes	FAC
2. *Fraxinus pennsylvanica*	5	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Acer rubrum*	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Rhizobium Spp.*	40		
2. *Coptis trifolia*	15	Yes	FACW
3. *Veratrum viride*	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply By:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals	45	(A)	110 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators:

____ 1- Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤ 3.0¹

✓ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

SOIL

Sampling Point: W-1-PFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 7	10YR 2/1	100					Org matter Muck	
7 - 18	10YR 4/1	100					Sandy Loam	

[1] Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2] Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
_✓_ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**
___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
Depth (inches): ____

Hydric Soil Present? Yes _✓_ No ____

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Tower Hill **City/County:** Pelham, Hampshire **Sampling Date:** 2020-Mar-23
Applicant/Owner: Cowls W.D., Inc. **State:** MA **Sampling Point:** W-1-UPL
Investigator(s): Kevin Ferguson, Greg Russo **Section, Township, Range:** NA
Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** None **Slope (%):** 1 to 3
Subregion (LRR or MLRA): LRR R **Lat:** 42.3682202653 **Long:** -72.4303689635 **Datum:** WGS84
Soil Map Unit Name: Scituate fine sandy loam, 3 to 8 percent slopes, very stony **NWI classification:** None
Are climatic/hydrologic conditions on the site typical for this time of year? Yes _✓_ No ____ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes _✓_ No ____
Are Vegetation ___, Soil ___, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No _✓_
Hydric Soil Present? Yes ____ No _✓_
Wetland Hydrology Present? Yes ____ No _✓_

Is the Sampled Area within a Wetland? **Yes ____ No _✓_**
If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report)
Covertype is UPL. Area is upland, not all three wetland parameters are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ____ No _✓_ Depth (inches): ____
Water Table Present? Yes ____ No _✓_ Depth (inches): ____
Saturation Present? Yes ____ No _✓_ Depth (inches): ____
(includes capillary fringe)

Wetland Hydrology Present? Yes ____ No _✓_

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The criteria for wetland hydrology has not been met.

Sampling Point: W-1-UPL

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga canadensis*	30	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	30	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Mitchella repens*	40	Yes	FACU
2. *Tsuga canadensis*	20	Yes	FACU
3. *Kalmia latifolia*	10	No	FACU
4.			
5.			
6.			
7.			
	70	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Dendrolycopodium dendroideum*	10	Yes	FACU
2. *Pinus strobus*	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	20	(A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply By:
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals	120	(A)	450 (B)

Prevalence Index = B/A = 3.8

Hydrophytic Vegetation Indicators:

_____ 1- Rapid Test for Hydrophytic Vegetation

_____ 2 - Dominance Test is > 50%

_____ 3 - Prevalence Index is ≤ 3.0¹

_____ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: W-1-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type¹	Loc²	Texture	Remarks
0 - 6	10YR 2/1	100					Silt Loam	
6 - 11	10YR 3/1	100					Sandy Loam	
11 - 14	10YR 3/1	70	10YR 4/1	30			Sandy Loam	
14+	Refusal							Refusal due to rock.

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. ²Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**
___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Large gravel
Depth (inches): 14

Hydric Soil Present? Yes _____ No ✓

Remarks:

No positive indication of hydric soil was observed. Refusal due to coarse rock fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Tower Hill **City/County:** Pelham, Hampshire **Sampling Date:** 2020-Mar-23
Applicant/Owner: Cowls W.D., Inc. **State:** MA **Sampling Point:** W-2-PFO
Investigator(s): Kevin Ferguson, GAR **Section, Township, Range:** NA
Landform (hillslope, terrace, etc.): Depression **Local relief (concave, convex, none):** Concave **Slope (%):** 1 to 3
Subregion (LRR or MLRA): LRR R **Lat:** 42.3669320046 **Long:** -72.4318132891 **Datum:** WGS84
Soil Map Unit Name: Scituate fine sandy loam, 3 to 8 percent slopes, very stony **NWI classification:** None
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___		
Hydric Soil Present?	Yes ✓ No ___	**Is the Sampled Area within a Wetland?**	**Yes ✓ No ___**
Wetland Hydrology Present?	Yes ✓ No ___	**If yes, optional Wetland Site ID:**	W-2-PFO

Remarks: (Explain alternative procedures here or in a separate report)
Covertype is PFO. Area is wetland, all three wetland parameters are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

✓ Surface Water (A1)
___ High Water Table (A2)
✓ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)

✓ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
✓ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
✓ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
✓ Microtopographic Relief (D4)
✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓ No ___	Depth (inches):	1
Water Table Present?	Yes ✓ No ___	Depth (inches):	1
Saturation Present? (includes capillary fringe)	Yes ✓ No ___	Depth (inches):	0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The criterion for wetland hydrology is met.

VEGETATION -- Use scientific names of plants.

Sampling Point: W-2-PFO

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	15	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Osmundastrum cinnamomeum*	10	Yes	FACW
2. *Sphagnum Spp.*	5	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply By:	
OBL species	5	x 1 =	5
FACW species	10	x 2 =	20
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals	30	(A)	70 (B)

Prevalence Index = B/A = 2.3

Hydrophytic Vegetation Indicators:

_____ 1- Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤ 3.0[1]

✓ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

SOIL

Sampling Point: W-2-PFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type¹	Loc²	Texture	Remarks
0 - 8	10YR 2/1	100					Hemic Muck	
8 - 10	10YR 5/2	100					Silt Loam	
10 - 18	10YR 5/6	100					Silt Loam	

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. ²Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
✓ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**

___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: None
Depth (inches):

Hydric Soil Present? Yes ✓ No ___

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Tower Hill **City/County:** Pelham, Hampshire **Sampling Date:** 2020-Mar-23
Applicant/Owner: Cowls W.D., Inc. **State:** MA **Sampling Point:** W-2-UPL
Investigator(s): Kevin Ferguson, Greg Russo **Section, Township, Range:** NA
Landform (hillslope, terrace, etc.): Foot slope **Local relief (concave, convex, none):** Convex **Slope (%):** 1 to 3
Subregion (LRR or MLRA): LRR R **Lat:** 42.3669120706 **Long:** -72.4316722032 **Datum:** WGS84
Soil Map Unit Name: Scituate fine sandy loam, 3 to 8 percent slopes, very stony **NWI classification:** None
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ✓		
Hydric Soil Present?	Yes ____ No ✓	**Is the Sampled Area within a Wetland?**	**Yes ____ No ✓**
Wetland Hydrology Present?	Yes ____ No ✓	**If yes, optional Wetland Site ID:**	

Remarks: (Explain alternative procedures here or in a separate report)
Covertype is UPL. Area is upland, not all three wetland parameters are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No ✓	Depth (inches):		
Water Table Present?	Yes ____ No ✓	Depth (inches):		**Wetland Hydrology Present?** Yes ____ No ✓
Saturation Present? (includes capillary fringe)	Yes ____ No ✓	Depth (inches):		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The criterion for wetland hydrology is not met.

Sampling Point: W-2-UPL

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Betula alleghaniensis*	20	Yes	FAC
2. *Acer rubrum*	15	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	35	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Kalmia latifolia*	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Dendrolycopodium dendroideum*	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply By:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	35	x 3 =	105
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals	55	(A)	185 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

_____ 1- Rapid Test for Hydrophytic Vegetation

_____ 2 - Dominance Test is > 50%

_____ 3 - Prevalence Index is ≤ 3.0¹

_____ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: W-2-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 5	2.5YR 3/3	100					Silt Loam	
5 - 7	10YR 4/6	85	2.5YR 3/3	15			Silt Loam	
	2.5YR 4/6	100					Silt Loam	

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**
___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
Depth (inches): ______

Hydric Soil Present? Yes _____ No ✓

Remarks:

The criterion for hydric soil is not met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Tower Hill **City/County:** Pelham, Hampshire **Sampling Date:** 2020-Mar-25
Applicant/Owner: Cowls W.D., Inc. **State:** MA **Sampling Point:** W-3-PFO
Investigator(s): Kevin Ferguson, Greg Russo **Section, Township, Range:** NA
Landform (hillslope, terrace, etc.): Depression **Local relief (concave, convex, none):** Concave **Slope (%):** 1 to 3
Subregion (LRR or MLRA): LRR R **Lat:** 42.3657605288 **Long:** -72.4309921415 **Datum:** WGS84
Soil Map Unit Name: Gloucester gravelly fine sandy loam, 8 to 15 percent slopes, very stony **NWI classification:** None
Are climatic/hydrologic conditions on the site typical for this time of year? Yes _✓_ No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes _✓_ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _✓_ No ____		
Hydric Soil Present?	Yes _✓_ No ____	**Is the Sampled Area within a Wetland?**	**Yes _✓_ No ____**
Wetland Hydrology Present?	Yes _✓_ No ____	**If yes, optional Wetland Site ID:**	W-3-PFO

Remarks: (Explain alternative procedures here or in a separate report)
Covertype is PFO. Area is wetland, all three wetland parameters are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- _✓_ Surface Water (A1)
- _✓_ High Water Table (A2)
- _✓_ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- _✓_ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- _✓_ Drainage Patterns (B10)
- _✓_ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- _✓_ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _✓_ No ____	Depth (inches):	1
Water Table Present?	Yes _✓_ No ____	Depth (inches):	1
Saturation Present? (includes capillary fringe)	Yes _✓_ No ____	Depth (inches):	0

Wetland Hydrology Present? Yes _✓_ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The criteria for wetland hydrology is met.

Sampling Point: W-3-PFO

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	10	Yes	FAC
2. *Pinus strobus*	5	Yes	FACU
3. *Betula alleghaniensis*	5	Yes	FAC
4.			
5.			
6.			
7.			
	20	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Kalmia latifolia*	20	Yes	FACU
2. *Acer rubrum*	5	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	25	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Sphagnum Spp.*	5	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	6	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	66.7	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply By:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals	50	(A)	165 (B)

Prevalence Index = B/A = 3.3

Hydrophytic Vegetation Indicators:

_____ 1- Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

_____ 3 - Prevalence Index is ≤ 3.0¹

✓ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

SOIL

Sampling Point: W-3-PFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 2/1	100					Sapric Muck	
3 - 9	10YR 2/1	50	10YR 5/2	50			Loamy Sand	
9 - 16	10YR 5/2	80	10YR 2/1	20			Loamy Sand	
16 - 18	10YR 6/2	100					Loamy Sand	
18+	Refusal							Refusal due to rock.

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
_✓_ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**

___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: Rock
Depth (inches): 18

Hydric Soil Present? Yes _✓_ No ____

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Tower Hill **City/County:** Pelham, Hampshire **Sampling Date:** 2020-Mar-25
Applicant/Owner: Cowls W.D., Inc. **State:** MA **SamplingPoint:** W-3-UPL
Investigator(s): Kevin Ferguson, Greg Russo **Section,Township,Range:** NA
Landform (hillslope, terrace, etc.): Hillslope **Local relief (concave, convex, none):** Convex **Slope (%):** 1 to 10
Subregion (LRR or MLRA): LRR R **Lat:** 42.3657774208 **Long:** -72.4310815954 **Datum:** WGS84
Soil Map Unit Name: Gloucester gravelly fine sandy loam, 8 to 15 percent slopes, very stony **NWI classification:** None
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___		
Hydric Soil Present?	Yes ___ No ✓	**Is the Sampled Area within a Wetland?**	**Yes ___ No ✓**
Wetland Hydrology Present?	Yes ___ No ✓	**If yes, optional Wetland Site ID:**	

Remarks: (Explain alternative procedures here or in a separate report)
Covertype is UPL. Area is upland, not all three wetland parameters are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No ✓	Depth (inches):	
Water Table Present?	Yes ___ No ✓	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ___ No ✓	Depth (inches):	

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The criteria for wetland hydrology is not met .

Sampling Point: W-3-UPL

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga canadensis*	30	Yes	FAC
2. *Quercus rubra*	5	No	FACU
3. *Pinus strobus*	5	No	FACU
4.			
5.			
6.			
7.			
	40	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	15	Yes	FAC
2. *Tsuga canadensis*	10	Yes	FAC
3. *Quercus rubra*	10	Yes	FACU
4. *Kalmia latifolia*	5	No	FACU
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Dendrolycopodium obscurum*	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	60	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply By:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	55	x 3 =	165
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals	85	(A)	285 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

_____ 1- Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

_____ 3 - Prevalence Index is ≤ 3.0[1]

_____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC). Since eastern hemlock is officially listed with an indicator status of FACU by the most recent National Wetland Plant List, this status is listed on this form. However, to conform with the classification of eastern hemlock as a wetland indicator under the MA WPA, the calculations have bee adjusted such that this species is considered FAC.

SOIL

Sampling Point: W-3-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 1	10YR 2/2	100					Hemic Loam	
1 - 3	10YR 3/3	100					Sandy Loam	
3 - 6	10YR 3/3	50	10YR 5/6	50			Sandy Loam	
6 - 20	10YR 5/6	100					Loamy Sand	

[1] Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2] Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**
___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
Depth (inches):

Hydric Soil Present? Yes _____ No ✓

Remarks:

No positive indication of hydric soils was observed.

Appendix D: NRCS Soil Report

United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for
Hampden and Hampshire Counties, Massachusetts, Eastern Part

Tower Road, Pelham, MA

September 18, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface.. 2
How Soil Surveys Are Made..5
Soil Map.. 8
  Soil Map..9
  Legend..10
  Map Unit Legend.. 12
  Map Unit Descriptions.. 12
    Hampden and Hampshire Counties, Massachusetts, Eastern Part................14
      316B—Scituate fine sandy loam, 3 to 8 percent slopes, very stony........... 14
      441B—Gloucester gravelly fine sandy loam, 3 to 8 percent slopes, very stony..15
      441C—Gloucester gravelly fine sandy loam, 8 to 15 percent slopes, very stony..17
      442B—Gloucester gravelly fine sandy loam, 3 to 8 percent slopes, extremely stony..18
      442C—Gloucester gravelly fine sandy loam, 8 to 15 percent slopes, extremely stony..20
      442D—Gloucester gravelly fine sandy loam, 15 to 25 percent slopes, extremely stony..21
References..23

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

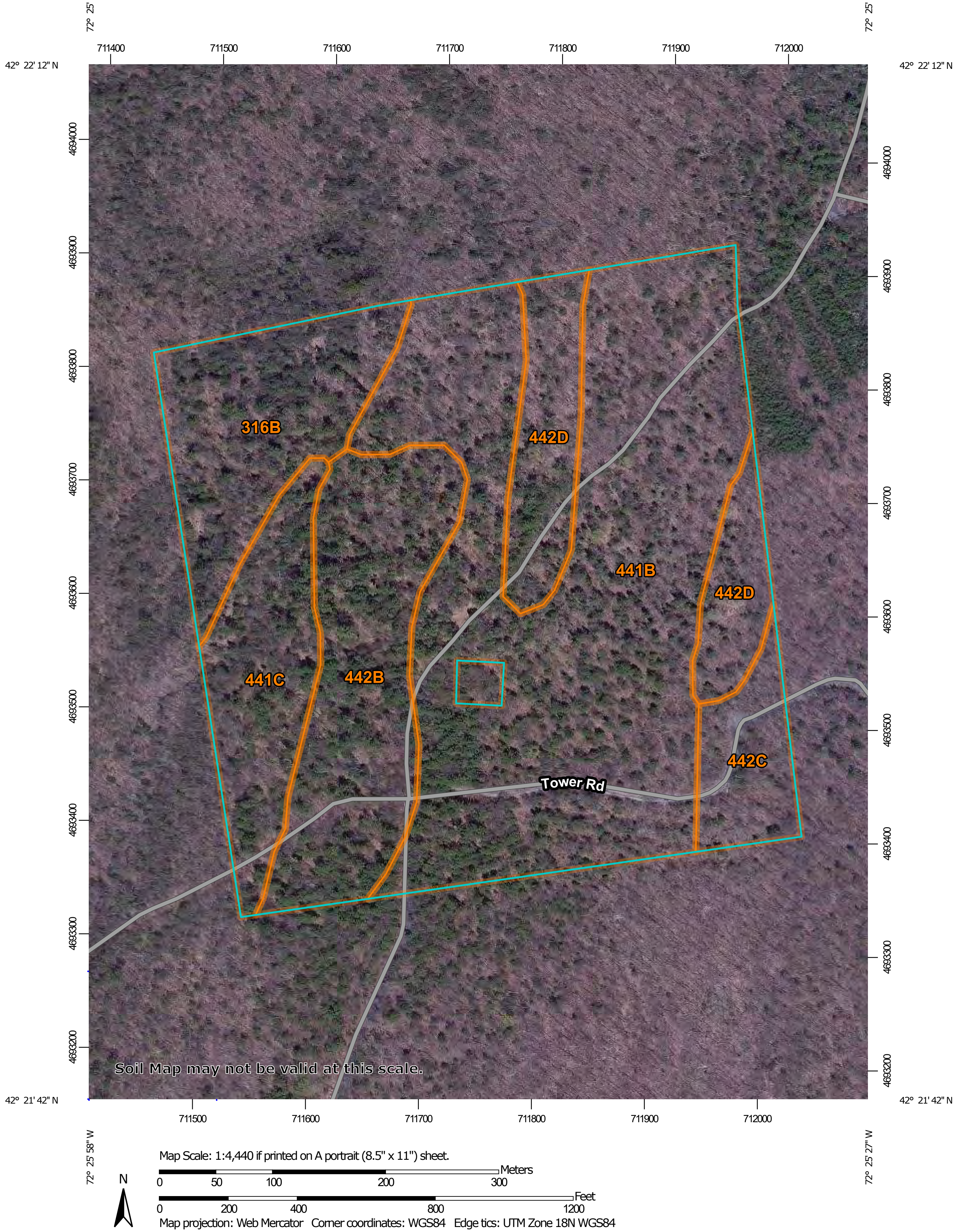
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map



Map Scale: 1:4,440 if printed on A portrait (8.5" x 11") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

□ Area of Interest (AOI)

Soils

□ Soil Map Unit Polygons

〰 Soil Map Unit Lines

■ Soil Map Unit Points

Special Point Features

◎ Blowout

⊠ Borrow Pit

✱ Clay Spot

◇ Closed Depression

✕ Gravel Pit

∴ Gravelly Spot

● Landfill

⋀ Lava Flow

⩛ Marsh or swamp

⚒ Mine or Quarry

◎ Miscellaneous Water

○ Perennial Water

∨ Rock Outcrop

+ Saline Spot

⁘ Sandy Spot

⊖ Severely Eroded Spot

◇ Sinkhole

≫ Slide or Slip

⌀ Sodic Spot

≡ Spoil Area

● Stony Spot

●● Very Stony Spot

♆ Wet Spot

△ Other

╌ Special Line Features

Water Features

〰 Streams and Canals

Transportation

┼┼┼ Rails

〰 Interstate Highways

〰 US Routes

〰 Major Roads

〰 Local Roads

Background

▨ Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampden and Hampshire Counties, Massachusetts, Eastern Part
Survey Area Data: Version 15, Jun 10, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 9, 2011—May 12, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
316B	Scituate fine sandy loam, 3 to 8 percent slopes, very stony	7.8	12.0%
441B	Gloucester gravelly fine sandy loam, 3 to 8 percent slopes, very stony	31.1	47.9%
441C	Gloucester gravelly fine sandy loam, 8 to 15 percent slopes, very stony	6.2	9.6%
442B	Gloucester gravelly fine sandy loam, 3 to 8 percent slopes, extremely stony	10.4	16.0%
442C	Gloucester gravelly fine sandy loam, 8 to 15 percent slopes, extremely stony	3.1	4.8%
442D	Gloucester gravelly fine sandy loam, 15 to 25 percent slopes, extremely stony	6.3	9.8%
Totals for Area of Interest		**64.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hampden and Hampshire Counties, Massachusetts, Eastern Part

316B—Scituate fine sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: vhy4
Elevation: 360 to 1,200 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Scituate and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scituate

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 27 inches: fine sandy loam
H3 - 27 to 65 inches: very gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 18 to 46 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C/D
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Paxton

Percent of map unit: 4 percent
Hydric soil rating: No

Canton

Percent of map unit: 4 percent
Hydric soil rating: No

Ridgebury

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Woodbridge

Percent of map unit: 4 percent
Hydric soil rating: No

Montauk

Percent of map unit: 4 percent
Hydric soil rating: No

441B—Gloucester gravelly fine sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: vht9
Elevation: 310 to 1,150 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Gloucester and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gloucester

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable sandy eolian deposits over friable sandy and gravelly basal till derived from granite and gneiss

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 15 inches: gravelly sandy loam
H3 - 15 to 65 inches: very gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144AY032NH - Dry Till Uplands
Hydric soil rating: No

Minor Components

Essex

Percent of map unit: 5 percent
Hydric soil rating: No

Montauk

Percent of map unit: 5 percent
Hydric soil rating: No

Charlton

Percent of map unit: 5 percent
Hydric soil rating: No

Scituate

Percent of map unit: 2 percent
Hydric soil rating: No

Ridgebury

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Woodbridge

Percent of map unit: 1 percent
Hydric soil rating: No

441C—Gloucester gravelly fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: vhtd
Elevation: 210 to 1,120 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Gloucester and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gloucester

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable sandy eolian deposits over friable sandy and gravelly basal till derived from granite and gneiss

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 15 inches: gravelly sandy loam
H3 - 15 to 65 inches: very gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Charlton
Percent of map unit: 5 percent
Hydric soil rating: No

Essex
Percent of map unit: 5 percent
Hydric soil rating: No

Montauk
Percent of map unit: 5 percent
Hydric soil rating: No

Scituate
Percent of map unit: 2 percent
Hydric soil rating: No

Woodbridge
Percent of map unit: 2 percent
Hydric soil rating: No

Ridgebury
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

442B—Gloucester gravelly fine sandy loam, 3 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vhtg
Elevation: 300 to 1,210 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Gloucester and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gloucester

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex

Parent material: Friable sandy eolian deposits over friable sandy and gravelly basal till derived from granite and gneiss

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 15 inches: gravelly sandy loam
H3 - 15 to 65 inches: very gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F144AY032NH - Dry Till Uplands
Hydric soil rating: No

Minor Components

Montauk

Percent of map unit: 4 percent
Hydric soil rating: No

Charlton

Percent of map unit: 4 percent
Hydric soil rating: No

Essex

Percent of map unit: 4 percent
Hydric soil rating: No

Scituate

Percent of map unit: 3 percent
Hydric soil rating: No

Ridgebury

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Woodbridge

Percent of map unit: 2 percent
Hydric soil rating: No

442C—Gloucester gravelly fine sandy loam, 8 to 15 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vhtj
Elevation: 300 to 1,230 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Gloucester and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gloucester

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable sandy eolian deposits over friable sandy and gravelly basal till derived from granite and gneiss

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 15 inches: gravelly sandy loam
H3 - 15 to 65 inches: very gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F144AY032NH - Dry Till Uplands

Hydric soil rating: No

Minor Components

Charlton
Percent of map unit: 5 percent
Hydric soil rating: No

Essex
Percent of map unit: 5 percent
Hydric soil rating: No

Montauk
Percent of map unit: 5 percent
Hydric soil rating: No

Scituate
Percent of map unit: 2 percent
Hydric soil rating: No

Woodbridge
Percent of map unit: 2 percent
Hydric soil rating: No

Ridgebury
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

442D—Gloucester gravelly fine sandy loam, 15 to 25 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vhtn
Elevation: 280 to 1,200 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Gloucester and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gloucester

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear

Across-slope shape: Convex
Parent material: Friable sandy eolian deposits over friable sandy and gravelly basal till derived from granite and gneiss

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 15 inches: gravelly sandy loam
H3 - 15 to 65 inches: very gravelly loamy sand

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F144AY032NH - Dry Till Uplands
Hydric soil rating: No

Minor Components

Montauk

Percent of map unit: 5 percent
Hydric soil rating: No

Charlton

Percent of map unit: 5 percent
Hydric soil rating: No

Essex

Percent of map unit: 5 percent
Hydric soil rating: No

Woodbridge

Percent of map unit: 3 percent
Hydric soil rating: No

Scituate

Percent of map unit: 2 percent
Hydric soil rating: No

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Appendix E: USGS StreamStats Report

StreamStats Report: Tower Road S-1

Region ID: MA
Workspace ID: MA20201002034736793000
Clicked Point (Latitude, Longitude): 42.37170, -72.43518
Time: 2020-10-01 23:47:52 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.0396	square miles
ELEV	Mean Basin Elevation	1080	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	0	percent
BSLDEM250	Mean basin slope computed from 1:250K DEM	9.915	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	-100000	square mile per mile

Parameter Code	Parameter Description	Value	Unit
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	1	dimensionless
BSLDEM10M	Mean basin slope computed from 10 m DEM	10.221	percent
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	0	percent
FOREST	Percentage of area covered by forest	100	percent
ACRSDFT	Area underlain by stratified drift	0	square miles
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	123701.8	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	902328.4	meters
CRSDFT	Percentage of area of coarse-grained stratified drift	0	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	498	feet per mi
LAKEAREA	Percentage of Lakes and Ponds	0	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	0	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0	percent
LFPLENGTH	Length of longest flow path	0.84	miles
MAXTEMPC	Mean annual maximum air temperature over basin area, in degrees Centigrade	13.2	feet per mi
OUTLETX	Basin outlet horizontal (x) location in state plane coordinates	122975	feet
OUTLETY	Basin outlet vertical (y) location in state plane coordinates	902775	feet
PRECPRIS00	Basin average mean annual precipitation for 1971 to 2000 from PRISM	48.8	inches
STRMTOT	total length of all mapped streams (1:24,000-scale) in the basin	0	miles
WETLAND	Percentage of Wetlands	0	percent

Peak-Flow Statistics Parameters[Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0396	square miles	0.16	512
ELEV	Mean Basin Elevation	1080	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	0	percent	0	32.3

Peak-Flow Statistics Disclaimers[Peak Statewide 2016 5156]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report[Peak Statewide 2016 5156]

Statistic	Value	Unit
2 Year Peak Flood	5.03	ft^3/s
5 Year Peak Flood	9.03	ft^3/s
10 Year Peak Flood	12.5	ft^3/s
25 Year Peak Flood	17.8	ft^3/s
50 Year Peak Flood	22.4	ft^3/s
100 Year Peak Flood	27.6	ft^3/s
200 Year Peak Flood	33.3	ft^3/s
500 Year Peak Flood	41.9	ft^3/s

Peak-Flow Statistics Citations

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Low-Flow Statistics Parameters[Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0396	square miles	1.61	149

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
BSLDEM250	Mean Basin Slope from 250K DEM	9.915	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	-100000	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

Low-Flow Statistics Flow Report[Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit

Low-Flow Statistics Citations

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Flow-Duration Statistics Parameters[Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0396	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	-100000	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	9.915	percent	0.32	24.6

Flow-Duration Statistics Flow Report[Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit

Flow-Duration Statistics Citations

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August Flow-Duration Statistics Parameters[Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0396	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	9.915	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	-100000	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

August Flow-Duration Statistics Flow Report[Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit

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Austin, S.H.,2014, Methods and equations for estimating peak streamflow per square mile in Virginia’s urban basins: U.S. Geological Survey Scientific Investigations Report 2014–5090, 25 p. (http://pubs.usgs.gov/sir/2014/5090/http://pubs.usgs.gov/sir/2014/5090/)

Curran, C.A. and Olsen, T.D.,2009, Estimating Low-Flow Frequency Statistics and Hydrologic Analysis of Selected Streamflow-Gaging Stations, Nooksack River Basin, Northwestern Washington and Canada: U.S. Geological Survey Scientific Investigations Report 2009-5170, 44 p. (http://pubs.usgs.gov/sir/2009/5170/)

Curran, C.A., Eng, Ken, and Konrad, C.P.,2012, Analysis of low flows and selected methods for estimating low-flow characteristics at partial-record and ungaged stream sites in western Washington: U.S. Geological Survey Scientific Investigations Report 2012-5078, 46 p. (http://pubs.usgs.gov/sir/2012/5078/)

Mastin, M.C., Konrad, C.P., Veilleux, A.G., and Tecca, A.E.,2016, Magnitude, frequency, and trends of floods at gaged and ungaged sites in Washington, based on data through water year 2014 (ver 1.1, October 2016): U.S. Geological Survey Scientific Investigations Report 2016–5118, 70 p. (http://dx.doi.org/10.3133/sir20165118)

Wiley, Jeffrey B.,2008, Estimating Selected Streamflow Statistics Representative of 1930–2002 in West Virginia: U.S. Geological Survey Scientific Investigations Report 2008-5105, 24 p. (http://pubs.usgs.gov/sir/2008/5105/)

Wiley, Jeffrey B.,1987, Techniques for estimating flood depth frequency relations for streams in West Virginia: U.S. Geological Survey Water-Resources Investigations Report 87-4111, 17 p. (https://pubs.er.usgs.gov/publication/wri874111)

Wiley, J.B., and Atkins, J.T., Jr.,2010, Estimation of flood-frequency discharges for rural, unregulated streams in West Virginia: U.S. Geological Survey Scientific Investigations Report 2010–5033, 78 p. (http://pubs.usgs.gov/sir/2010/5033/)

Wiley, J.B., and Atkins, J.T., Jr.,2010, Estimation of selected seasonal streamflow statistics representative of 1930-2002 in West Virginia: U.S. Geological Survey Scientific Investigations Report 2010-5185, 20 p. (http://pubs.usgs.gov/sir/2010/5185/)

Conger, Duane H.,1986, Estimating Magnitude and Frequency of Floods for Wisconsin Urban Streams: U.S. Geological Survey Water-Resources Investigations Report 86-4005, 18 p. (http://pubs.er.usgs.gov/publication/wri864005)

Walker, J.F., Peppler, M.C., Danz, M.E., and Hubbard, L.E.,2017, Flood-frequency characteristics of Wisconsin streams (ver. 2.1, December 2017): Reston, Virginia, U.S. Geological Survey Scientific Investigations Report 2016–5140, 33 p., 1 plate, 2 appendixes (https://doi.org/10.3133/sir20165140)

Miller, Kirk A.,2003, Peak-flow Characteristics of Wyoming Streams: U.S. Geological Survey Water-Resources Investigations Report 03-4107, 79 p. (http://pubs.usgs.gov/wri/wri034107/)

Ramos-Ginés, Orlando,1999, Estimation of Magnitude and Frequency of Floods for Streams in Puerto Rico: New Empirical Models: U. S. Geological Survey Water-Resources Investigations Report 99-4142, 41 p. (http://pubs.usgs.gov/wri/wri994142/)

Moody, J.A.,2012, An analytical method for predicting postwildfire peak discharges: U.S. Geological Survey Scientific Investigations Report 2011–5236, 36 p. (https://pubs.usgs.gov/sir/2011/5236/)

testtest (test)

Bankfull Statistics Parameters[Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0396	square miles	0.6	329
BSLDEM10M	Mean Basin Slope from 10m DEM	10.221	percent	2.2	23.9

Bankfull Statistics Disclaimers[Bankfull Statewide SIR2013 5155]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Bankfull Statistics Flow Report[Bankfull Statewide SIR2013 5155]

Statistic	Value	Unit
Bankfull Width	4.5	ft
Bankfull Depth	0.394	ft

Statistic	Value	Unit
Bankfull Area	1.73	ft^2
Bankfull Streamflow	4.28	ft^3/s

Bankfull Statistics Citations

Bent, G.C., and Waite, A.M.,2013, Equations for estimating bankfull channel geometry and discharge for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2013–5155, 62 p., (http://pubs.usgs.gov/sir/2013/5155/)

Probability Statistics Parameters[Perennial Flow Probability]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0396	square miles	0.01	1.99
PCTSNDGRV	Percent Underlain By Sand And Gravel	0	percent	0	100
FOREST	Percent Forest	100	percent	0	100
MAREGION	Massachusetts Region	1	dimensionless	0	1

Probability Statistics Flow Report[Perennial Flow Probability]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PC
Probability Stream Flowing Perennially	0.123	dim	71

Probability Statistics Citations

Bent, G.C., and Steeves, P.A.,2006, A revised logistic regression equation and an automated procedure for mapping the probability of a stream flowing perennially in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2006–5031, 107 p. (http://pubs.usgs.gov/sir/2006/5031/pdfs/SIR_2006-5031rev.pdf)

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Application Version: 4.4.0

StreamStats Report: Tower Road S-2

Region ID: MA
Workspace ID: MA20201002040053493000
Clicked Point (Latitude, Longitude): 42.35585, -72.43647
Time: 2020-10-02 00:01:13 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.28	square miles
ELEV	Mean Basin Elevation	986	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	0	percent
BSLDEM250	Mean basin slope computed from 1:250K DEM	7.189	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.69	square mile per mile

Parameter Code	Parameter Description	Value	Unit
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	1	dimensionless
BSLDEM10M	Mean basin slope computed from 10 m DEM	9.098	percent
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	42.71	percent
FOREST	Percentage of area covered by forest	99.12	percent
ACRSDFT	Area underlain by stratified drift	0.12	square miles
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	123251.9	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	901728.4	meters
CRSDFT	Percentage of area of coarse-grained stratified drift	42.71	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	204	feet per mi
LAKEAREA	Percentage of Lakes and Ponds	0	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	6.95	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.28	percent
LFPLENGTH	Length of longest flow path	1.36	miles
MAXTEMPC	Mean annual maximum air temperature over basin area, in degrees Centigrade	13.3	feet per mi
OUTLETX	Basin outlet horizontal (x) location in state plane coordinates	122845	feet
OUTLETY	Basin outlet vertical (y) location in state plane coordinates	901015	feet
PRECPRIS00	Basin average mean annual precipitation for 1971 to 2000 from PRISM	48.7	inches
STRMTOT	total length of all mapped streams (1:24,000-scale) in the basin	0.18	miles
WETLAND	Percentage of Wetlands	0.91	percent

Peak-Flow Statistics Parameters[Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.28	square miles	0.16	512
ELEV	Mean Basin Elevation	986	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	0	percent	0	32.3

Peak-Flow Statistics Flow Report[Peak Statewide 2016 5156]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	Plu	SEp
2 Year Peak Flood	23.2	ft^3/s	11.4	47.1	42.3
5 Year Peak Flood	40.5	ft^3/s	19.6	83.5	43.4
10 Year Peak Flood	55.2	ft^3/s	26.1	117	44.7
25 Year Peak Flood	77.4	ft^3/s	35.1	170	47.1
50 Year Peak Flood	96.4	ft^3/s	42.3	220	49.4
100 Year Peak Flood	117	ft^3/s	49.6	276	51.8
200 Year Peak Flood	141	ft^3/s	57.8	344	54.1
500 Year Peak Flood	175	ft^3/s	68.1	450	57.6

Peak-Flow Statistics Citations

Zarriello, P.J.,2017, Magnitude of flood flows at selected annual exceedance probabilities for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2016–5156, 99 p. (https://dx.doi.org/10.3133/sir20165156)

Low-Flow Statistics Parameters[Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.28	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	7.189	percent	0.32	24.6

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRFTPERSTR	Stratified Drift per Stream Length	0.69	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

Low-Flow Statistics Disclaimers[Statewide Low Flow WRIR00 4135]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report[Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0907	ft^3/s
7 Day 10 Year Low Flow	0.0685	ft^3/s

Low-Flow Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

Flow-Duration Statistics Parameters[Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.28	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	0.69	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	7.189	percent	0.32	24.6

Flow-Duration Statistics Disclaimers[Statewide Low Flow WRIR00 4135]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Flow-Duration Statistics Flow Report[Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit
50 Percent Duration	0.261	ft^3/s
60 Percent Duration	0.195	ft^3/s
70 Percent Duration	0.189	ft^3/s
75 Percent Duration	0.167	ft^3/s
80 Percent Duration	0.227	ft^3/s
85 Percent Duration	0.185	ft^3/s
90 Percent Duration	0.208	ft^3/s
95 Percent Duration	0.124	ft^3/s
98 Percent Duration	0.086	ft^3/s
99 Percent Duration	0.0611	ft^3/s

Flow-Duration Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

August Flow-Duration Statistics Parameters[Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.28	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	7.189	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.69	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

August Flow-Duration Statistics Disclaimers[Statewide Low Flow WRIR00 4135]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

August Flow-Duration Statistics Flow Report[Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit

Statistic	Value	Unit
August 50 Percent Duration	0.195	ft^3/s

August Flow-Duration Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

Bankfull Statistics Parameters[Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.28	square miles	0.6	329
BSLDEM10M	Mean Basin Slope from 10m DEM	9.098	percent	2.2	23.9

Bankfull Statistics Disclaimers[Bankfull Statewide SIR2013 5155]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Bankfull Statistics Flow Report[Bankfull Statewide SIR2013 5155]

Statistic	Value	Unit
Bankfull Width	9.51	ft
Bankfull Depth	0.681	ft
Bankfull Area	6.37	ft^2
Bankfull Streamflow	17.1	ft^3/s

Bankfull Statistics Citations

Bent, G.C., and Waite, A.M.,2013, Equations for estimating bankfull channel geometry and discharge for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2013–5155, 62 p., (http://pubs.usgs.gov/sir/2013/5155/)

Probability Statistics Parameters[Perennial Flow Probability]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.28	square miles	0.01	1.99
PCTSNDGRV	Percent Underlain By Sand And Gravel	42.71	percent	0	100
FOREST	Percent Forest	99.12	percent	0	100
MAREGION	Massachusetts Region	1	dimensionless	0	1

Probability Statistics Flow Report[Perennial Flow Probability]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PC
Probability Stream Flowing Perennially	0.614	dim	71

Probability Statistics Citations

Bent, G.C., and Steeves, P.A.,2006, A revised logistic regression equation and an automated procedure for mapping the probability of a stream flowing perennially in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2006–5031, 107 p. (http://pubs.usgs.gov/sir/2006/5031/pdfs/SIR_2006-5031rev.pdf)

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Application Version: 4.4.0

ATTACHMENT C
Abutter Information
(Certified Abutter List)

PELHAM BOARD OF ASSESSORS
REQUEST FOR CERTIFIED LIST OF ABUTTERS

Note: THE ASSESSORS OFFICE REQUIRES 10 BUSINESS DAYS TO PREPARE AN ABUTTERS LIST. WE THEREFORE ADVISE YOU NOT TO SCHEDULE A HEARING UNTIL YOU HAVE THIS LIST.

Please Print

Tower Road
STREET ADDRESS

Cowls W D Inc.
OWNER'S NAME

PO Box 9677
STREET

North Amherst, MA 01059
CITY ST

14
MAP

1
PARCEL

Molly Lennon
APPLICANT'S NAME

TRC, 650 Suffolk Street
STREET

Lowell, MA 01854
CITY STATE ZIP

Molly Lennon, 978-856-5912
CONTACT PERSON & PHONE #

*****Please note that if requesting abutters lists for two different departments for the same parcel, you must fill out separate abutters request forms.*****

Please circle type of permit or variance requested:

A: Liquor License – Immediate abutters, also 500' from all borders for churches/hospitals/public & private schools.

B: Planning Board – Subdivision or Special Permit - 300'

C: Zoning: - Special Permit or Variance Appeals - 300'

[✓ **D: Conservation: -Wetland Hearing - 300'**]

E: Planning - Site Plan Review 300'

F: Selectboard - 300'

NOTE: **THE ABUTTERS LIST IS <u>ONLY OFFICIAL FOR A PERIOD OF 30 DAYS</u> FROM THE DATE OF CERTIFICATION BY THE ASSESSOR. AFTER 30 DAYS, YOU WOULD NEED TO REAPPLY FOR A NEW LIST.**

RECEIVED

(ASO002)

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14-1.A
PELHAM
PELHAM TOWN OF
351 AMHERST RD RHODES BLDG
PELHAM, MA 01002

14-1
PELHAM
COWLS W D INC
PO BOX 9677
NORTH AMHERST, MA 01059-9677

14-2
PELHAM
COMMONWEALTH OF MASS
390 WHITMORE HALL, UMASS
AMHERST, MA 01003-9313

14-1.A
PELHAM
PELHAM TOWN OF
351 AMHERST RD RHODES BLDG
PELHAM, MA 01002

14-1
PELHAM
COWLS W D INC
PO BOX 9677
NORTH AMHERST, MA 01059-9677

14-2
PELHAM
COMMONWEALTH OF MASS
390 WHITMORE HALL, UMASS
AMHERST, MA 01003-9313

Easy Peel® Labels
Use Avery® Template 5160®
Feed Paper
Bend along line to expose Pop-up Edge™
AVERY® 5160®

ATTACHMENT D
Figure 1: Delineated Resources Map (November 2020)

TRC - GIS

Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet (Foot US)
Map Rotation: 0

Plot Date: 11/5/2020, 11:04:51 AM by SMOTURI -- LAYOUT: ANSI B(11"x17")
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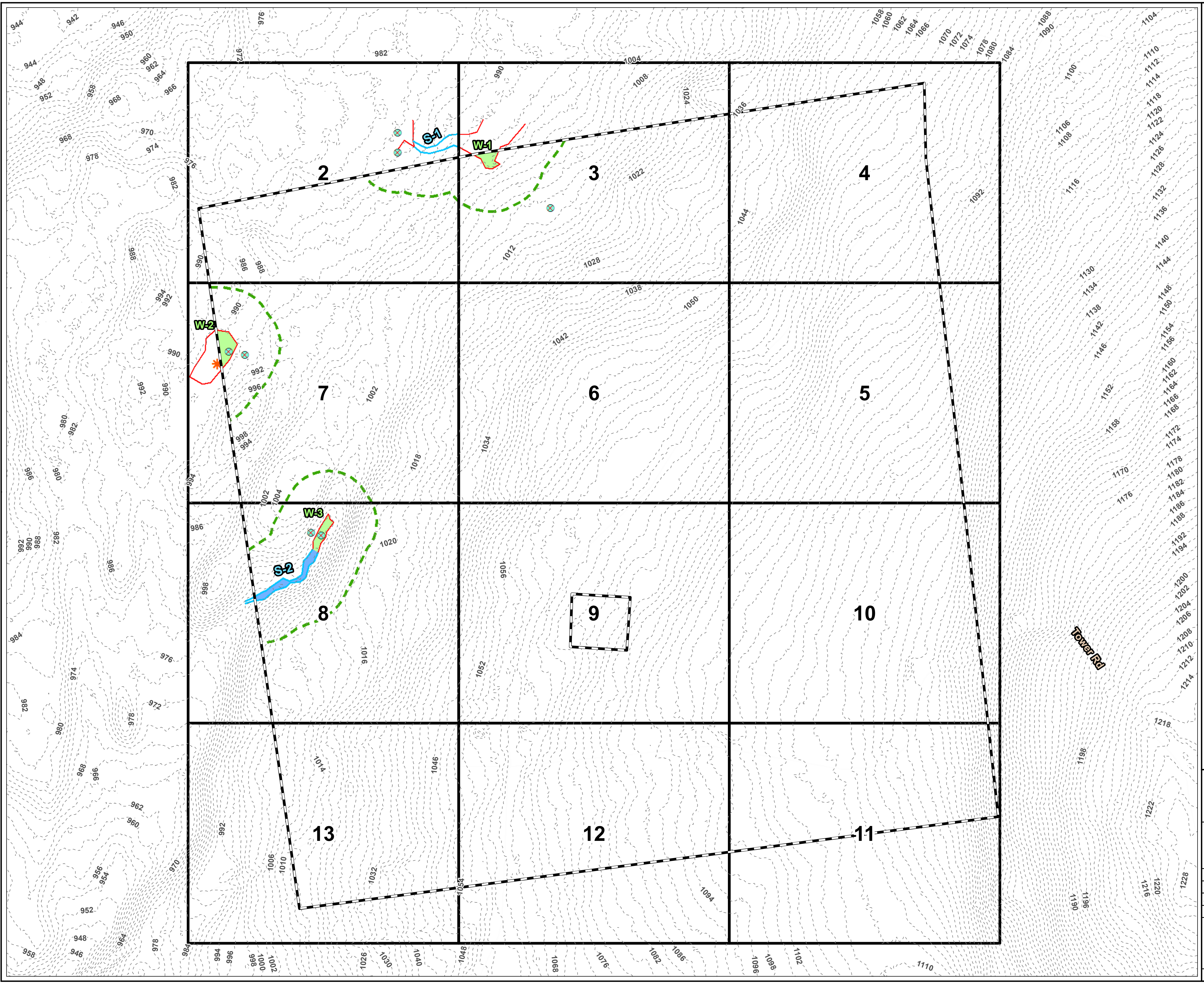

LEGEND

- PROJECT BOUNDARY
- 1:50' MAP PAGE
- ⊗ USACE PLOT
- DELINEATED INTERMITTENT STREAM BANK
- LAND UNDER WATERBODIES AND WATERWAYS
- WETLAND BOUNDARY LINE
- DELINEATED WETLAND
- 100-FT WETLAND BUFFER
- 2-FT CONTOUR

NOTES:

1 RESOURCES WERE DELINEATED BY TRC ON 3/23/2020, AND 3/25/2020.
2 2-FT CONTOURS ARE GENERATED FROM 1-METER USGS NED, 2015

N

0 220 440 Feet

1:2,640

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY:	S. MOTURI	PROJ NO.:	387920
CHECKED BY:	M. LENNON	**FIGURE 1**	
APPROVED BY:	M. FIRSTENBERG		
DATE:	NOVEMBER 2020	Page 1 of 14	

TRC

650 SUFFOLK STREET
LOWELL, MA 01854

FILE NO.: TowerHill_ANRAD_Overview_11x17_20201105.mxd

TRC - GIS

Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet (Foot US)
Map Rotation: 0

Plot Date: 11/5/2020, 11:03:19 AM by SMOTURI -- LAYOUT: ANSI B(11"x17")
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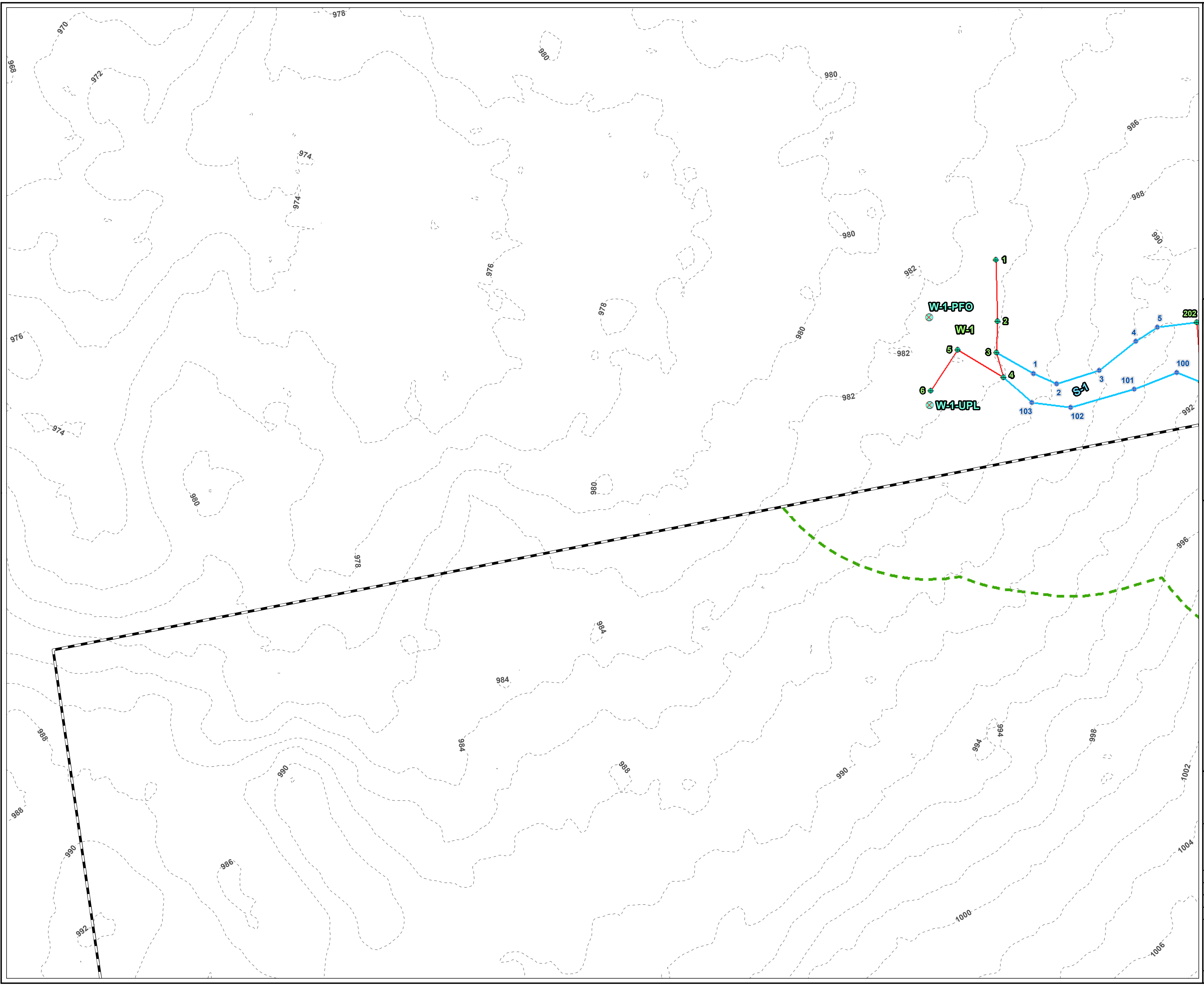
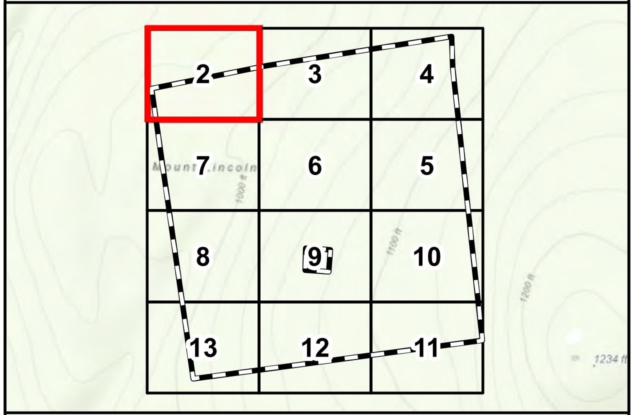


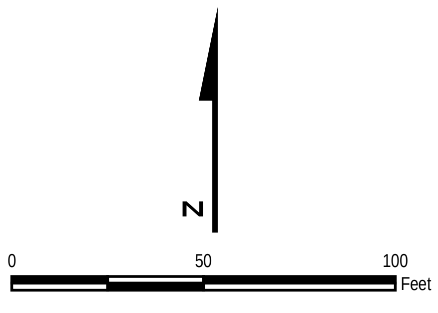
LEGEND

- PROJECT BOUNDARY
- WETLAND FLAG
- STREAM FLAG
- USACE PLOT
- DELINEATED INTERMITTENT STREAM BANK
- WETLAND BOUNDARY LINE
- 100-FT WETLAND BUFFER
- 2-FT CONTOUR



NOTES:

1 RESOURCES WERE DELINEATED BY TRC ON 3/23/2020, AND 3/25/2020.
2 2-FT CONTOURS ARE GENERATED FROM 1-METER USGS NED, 2015



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PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY: S. MOTURI
CHECKED BY: M. LENNON
APPROVED BY: M. FIRSTENBERG
DATE: NOVEMBER 2020

PROJ NO.: 387920

FIGURE 1
Page 2 of 14

TRC

650 SUFFOLK STREET
LOWELL, MA 01854

FILE NO.: TowerHill_ANRAD_SHEETS_11x17_20201105.mxd

Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet (Foot US)
Map Rotation: 0

Plot Date: 11/5/2020, 11:03:19 AM by SMOTURI -- LAYOUT: ANSI B(11"x17")
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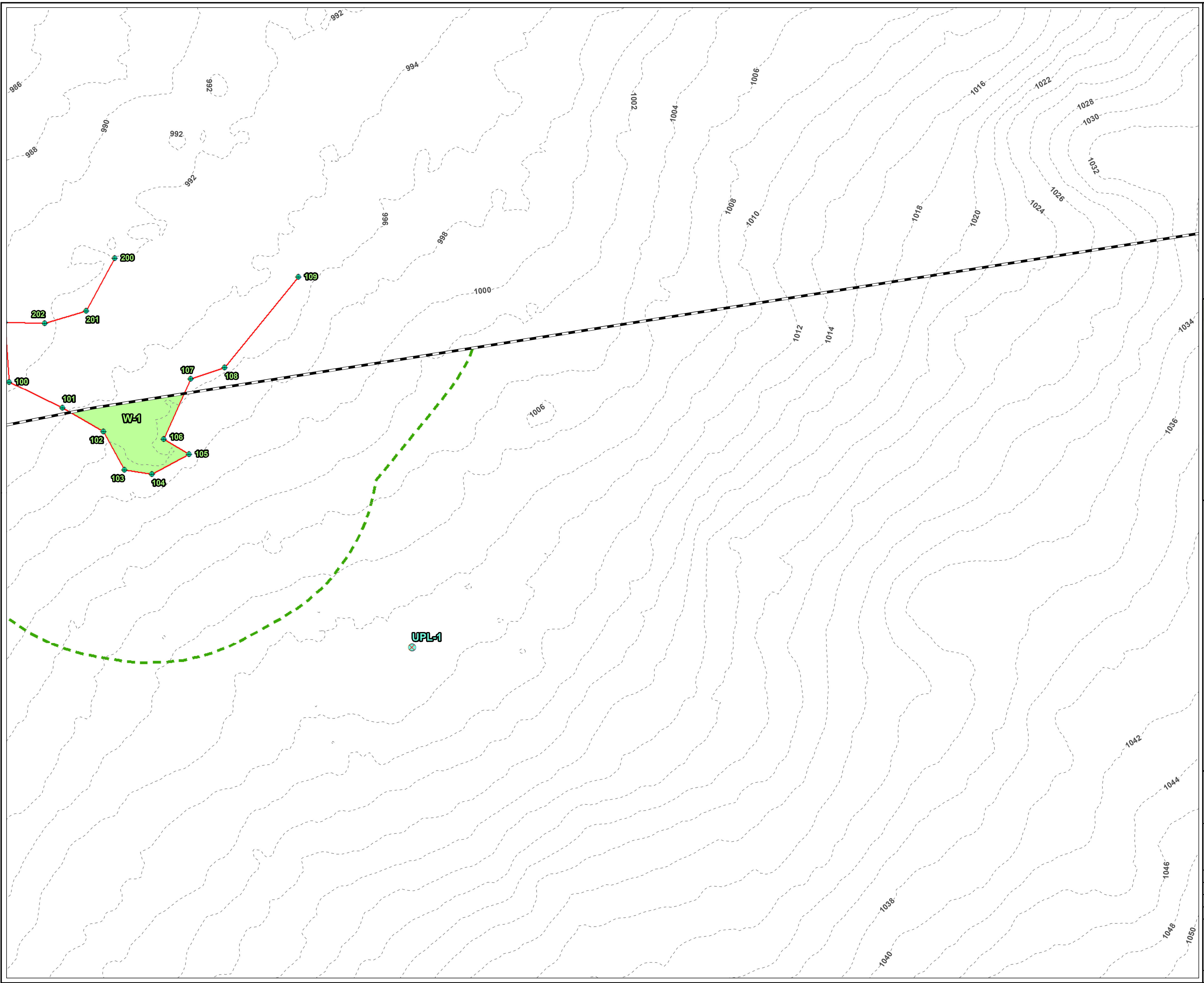
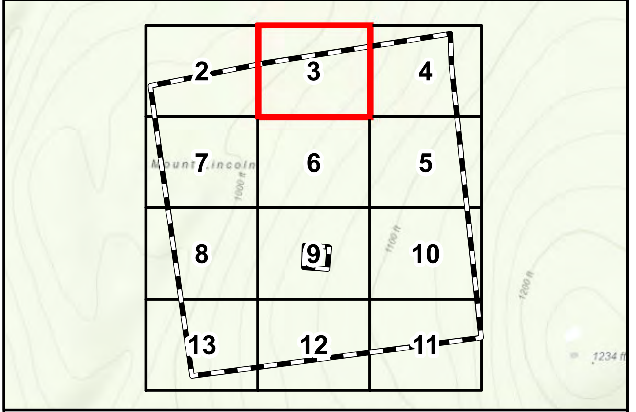


LEGEND

⬚ PROJECT BOUNDARY
⊕ WETLAND FLAG
⊗ USACE PLOT
〜 DELINEATED INTERMITTENT STREAM BANK
〜 WETLAND BOUNDARY LINE
🟩 DELINEATED WETLAND
⋯ 100-FT WETLAND BUFFER
⋯ 2-FT CONTOUR



NOTES:

1 RESOURCES WERE DELINEATED BY TRC ON 3/23/2020, AND 3/25/2020.
2 2-FT CONTOURS ARE GENERATED FROM 1-METER USGS NED, 2015

N

0 50 100
Feet

1:600

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY: S. MOTURI
CHECKED BY: M. LENNON
APPROVED BY: M. FIRSTENBERG
DATE: NOVEMBER 2020
PROJ NO.: 387920

FIGURE 1
Page 3 of 14

TRC
650 SUFFOLK STREET
LOWELL, MA 01854

FILE NO.: TowerHill_ANRAD_SHEETS_11x17_20201105.mxd

TRC - GIS

Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet (Foot US)
Map Rotation: 0

Plot Date: 11/5/2020, 11:03:19 AM by SMOTURI -- LAYOUT: ANSI B(11"x17")
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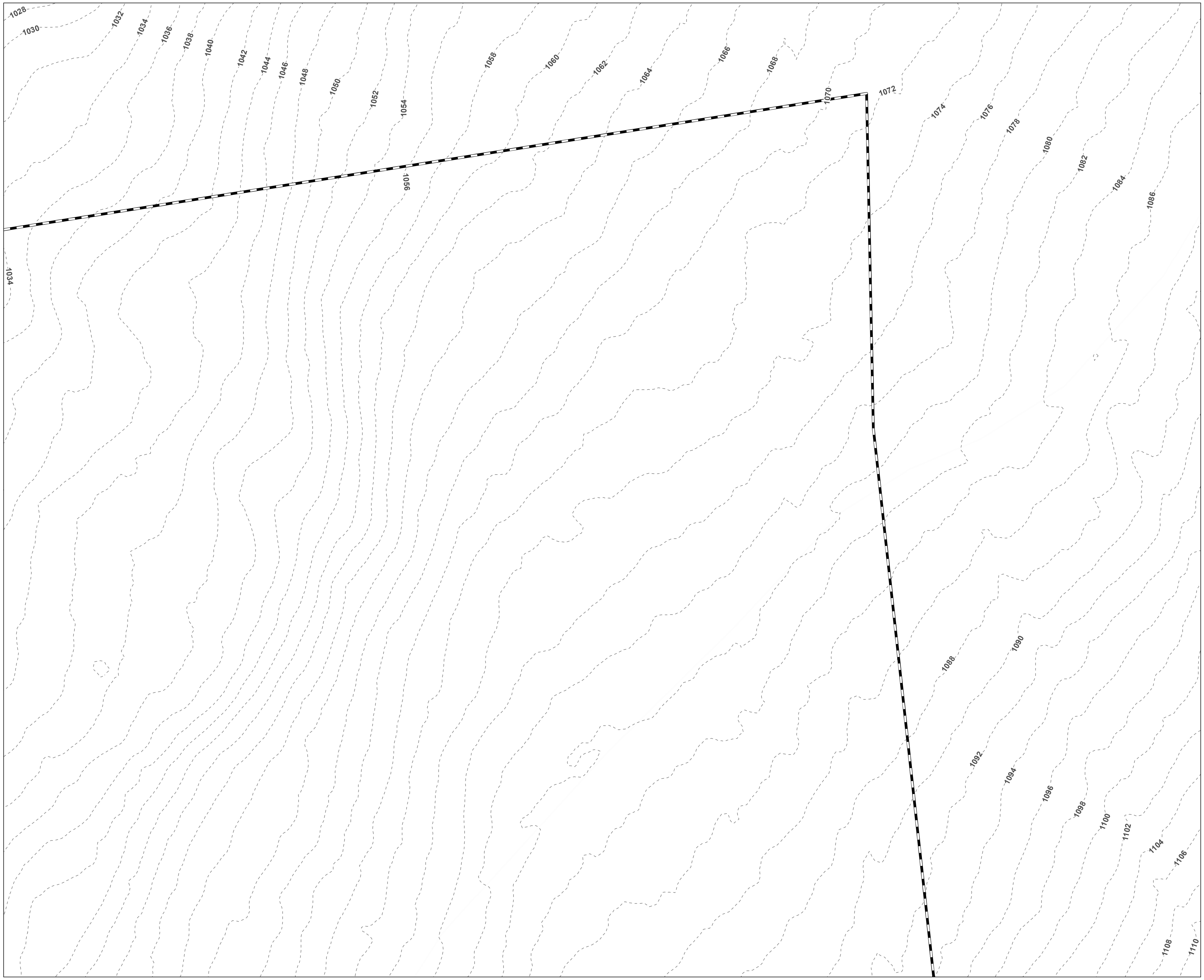
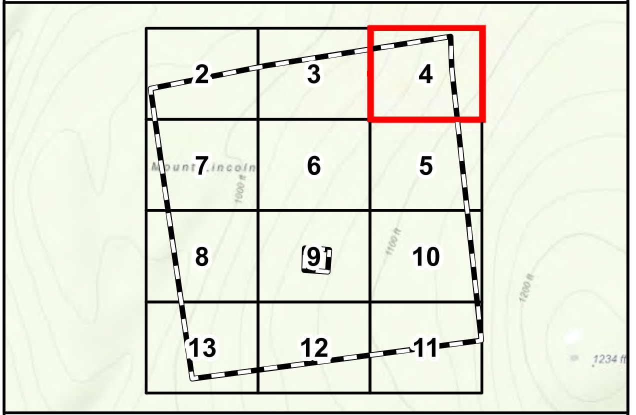


LEGEND

⬚	PROJECT BOUNDARY
┄	2-FT CONTOUR



NOTES:

1 RESOURCES WERE DELINEATED BY TRC ON 3/23/2020, AND 3/25/2020.
2 2-FT CONTOURS ARE GENERATED FROM 1-METER USGS NED, 2015

N

0 50 100
Feet

1:600

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY:	S. MOTURI	PROJ NO.:	387920
CHECKED BY:	M. LENNON	**FIGURE 1**	
APPROVED BY:	M. FIRSTENBERG		
DATE:	NOVEMBER 2020	Page 4 of 14	

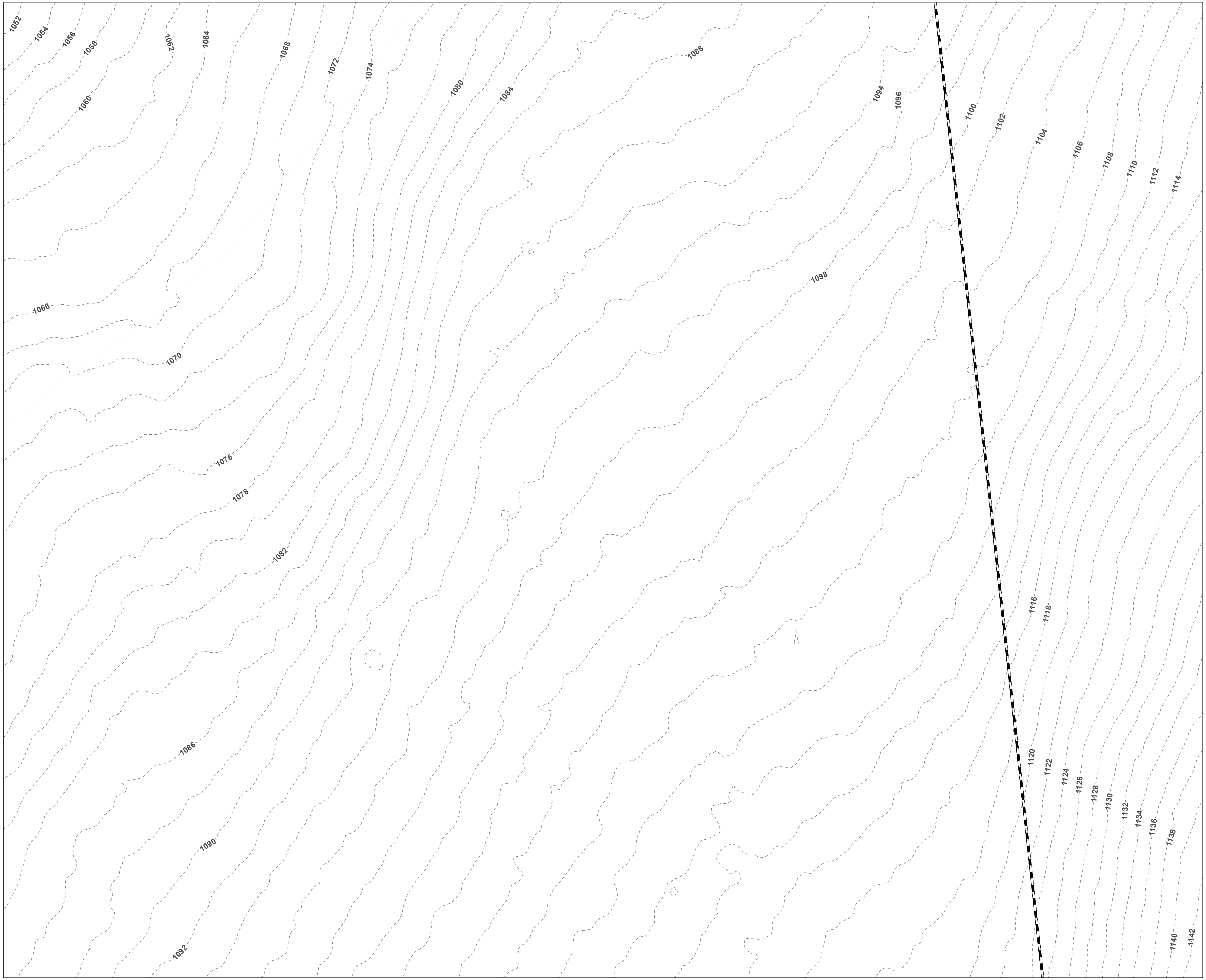
TRC
650 SUFFOLK STREET
LOWELL, MA 01854

FILE NO.: TowerHill_ANRAD_SHEETS_11x17_20201105.mxd

TRC - GIS

Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet (Foot US)
Map Rotation: 0

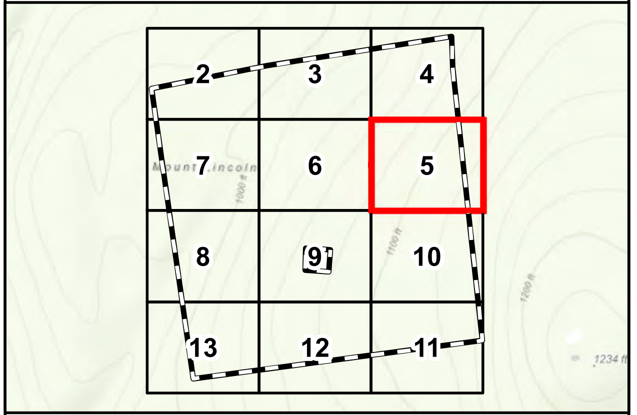
Plot Date: 11/5/2020, 11:03:19 AM by SMOTURI -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\AMP\387920_TowerHill\5-MXD\TowerHill_ANRAD_SHEETS_11x17_20201105.mxd



LEGEND

PROJECT BOUNDARY

2-FT CONTOUR



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N

0 50 100
Feet

1:600

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY: S. MOTURI
CHECKED BY: M. LENNON
APPROVED BY: M. FIRSTENBERG
DATE: NOVEMBER 2020

PROJ NO.: 387920

FIGURE 1
Page 5 of 14

TRC

650 SUFFOLK STREET
LOWELL, MA 01854

FILE NO.: TowerHill_ANRAD_SHEETS_11x17_20201105.mxd

TRC - GIS

Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet (Foot US)
Map Rotation: 0

Plot Date: 11/5/2020, 11:03:19 AM by SMOTURI -- LAYOUT: ANSI B(11"x17")
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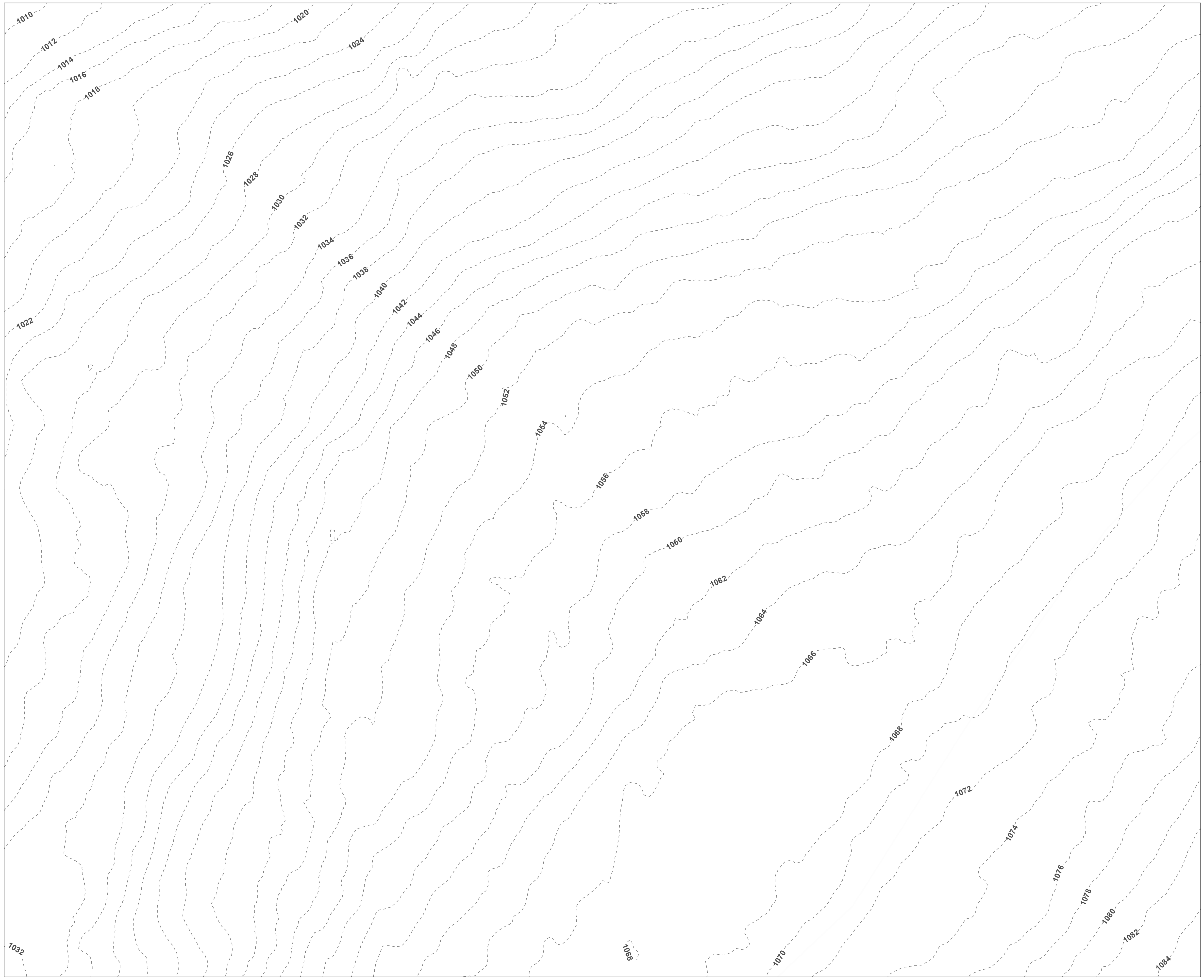
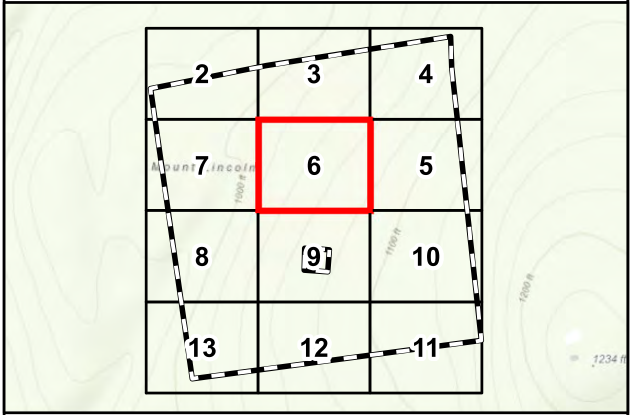


LEGEND

▨ PROJECT BOUNDARY

2-FT CONTOUR



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N

0 50 100
Feet

1:600

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY: S. MOTURI
CHECKED BY: M. LENNON
APPROVED BY: M. FIRSTENBERG
DATE: NOVEMBER 2020

PROJ NO.: 387920

FIGURE 1
Page 6 of 14

TRC
650 SUFFOLK STREET
LOWELL, MA 01854

FILE NO.: TowerHill_ANRAD_SHEETS_11x17_20201105.mxd

TRC - GIS

Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet (Foot US)
Map Rotation: 0

Plot Date: 11/5/2020, 11:03:19 AM by SMOTURI -- LAYOUT: ANSI B(11"x17")
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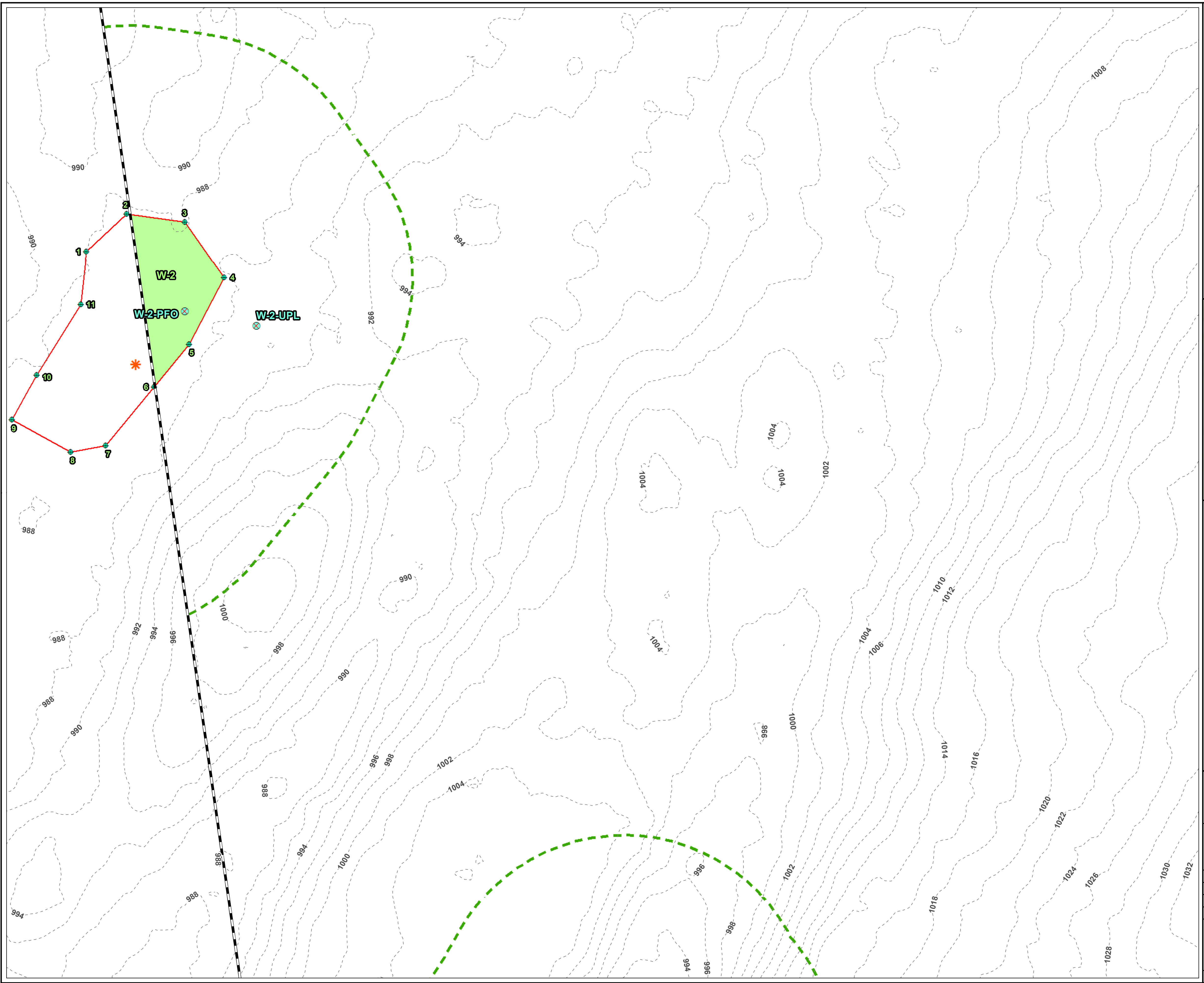
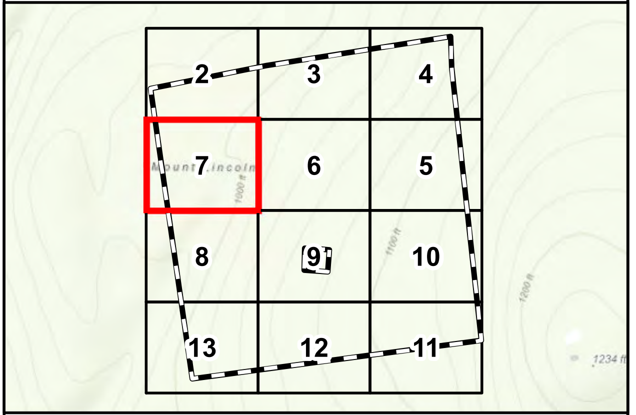


LEGEND

- PROJECT BOUNDARY
- WETLAND FLAG
- USACE PLOT
- POTENTIAL VERNAL POOL
- WETLAND BOUNDARY LINE
- DELINEATED WETLAND
- 100-FT WETLAND BUFFER
- 2-FT CONTOUR



NOTES:

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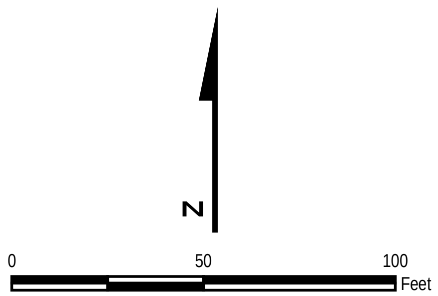


1:600

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY:	S. MOTURI
CHECKED BY:	M. LENNON
APPROVED BY:	M. FIRSTENBERG
DATE:	NOVEMBER 2020

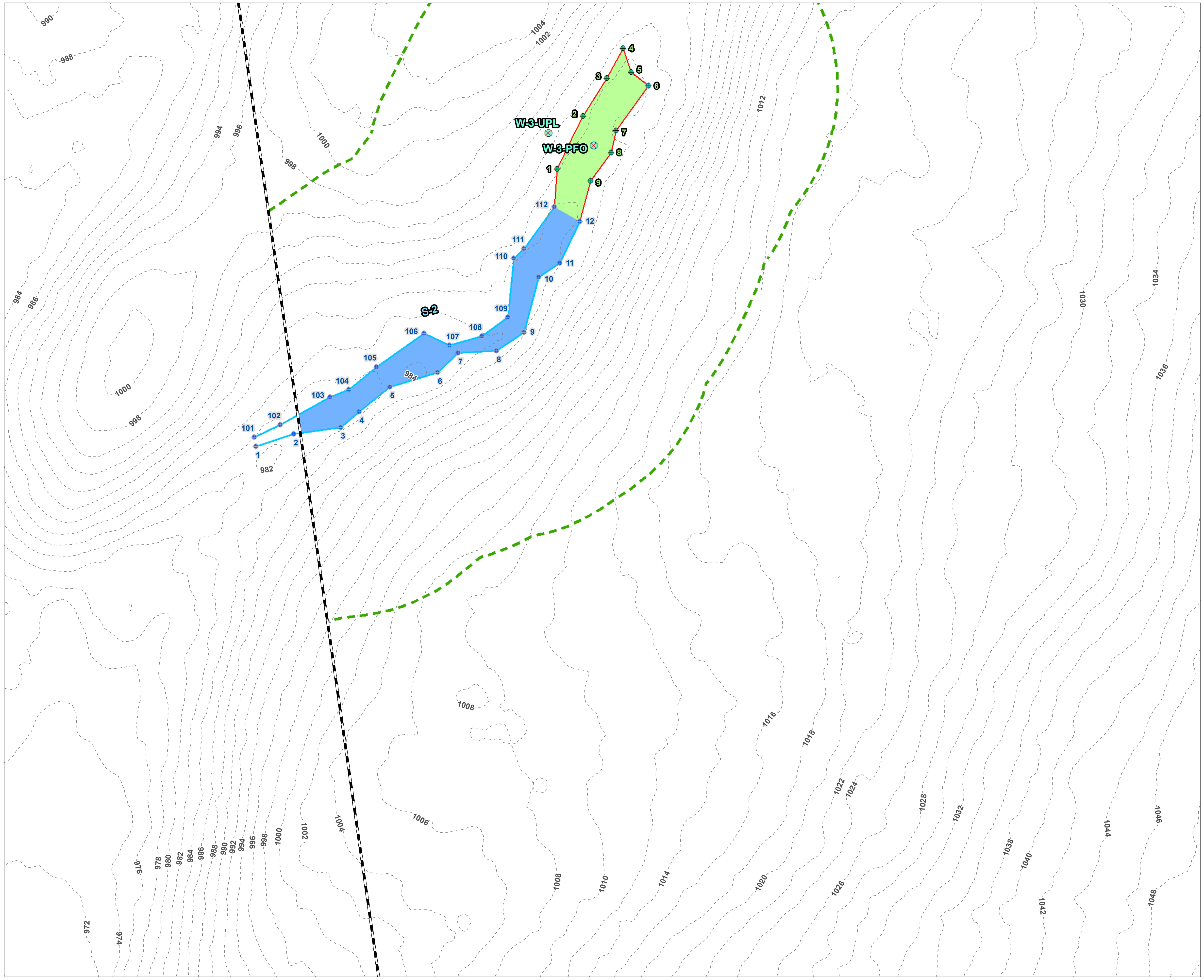
PROJ NO.: 387920

FIGURE 1
Page 7 of 14

TRC
650 SUFFOLK STREET
LOWELL, MA 01854

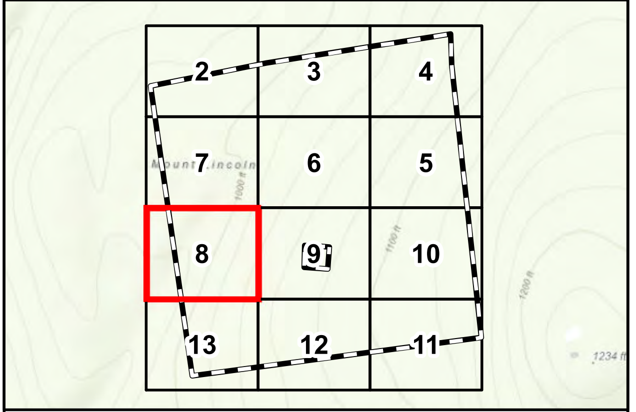
FILE NO.: TowerHill_ANRAD_SHEETS_11x17_20201105.mxd

TRC - GIS
Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet (Foot US)
Map Rotation: 0
Plot Date: 11/5/2020, 11:03:19 AM by SMOTURI -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\AMP\387920_TowerHill\5-MXD\TowerHill_ANRAD_SHEETS_11x17_20201105.mxd



LEGEND

- ⬚ PROJECT BOUNDARY
- ⊕ WETLAND FLAG
- ● STREAM FLAG
- ⊗ USACE PLOT
- ～ DELINEATED INTERMITTENT STREAM BANK
- 🟦 LAND UNDER WATERBODIES AND WATERWAYS
- ～ WETLAND BOUNDARY LINE
- 🟩 DELINEATED WETLAND
- ╌ 100-FT WETLAND BUFFER
- ╌ 2-FT CONTOUR



NOTES:

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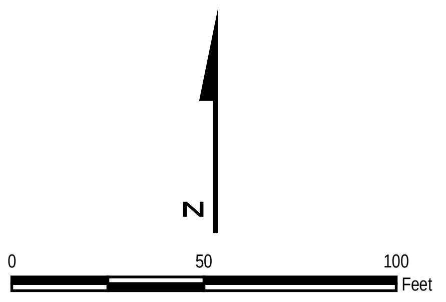

1:600

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY:	S. MOTURI	PROJ NO.:	387920
CHECKED BY:	M. LENNON	**FIGURE 1**	
APPROVED BY:	M. FIRSTENBERG	Page 8 of 14	
DATE:	NOVEMBER 2020		

TRC
650 SUFFOLK STREET
LOWELL, MA 01854

FILE NO.: TowerHill_ANRAD_SHEETS_11x17_20201105.mxd

TRC - GIS

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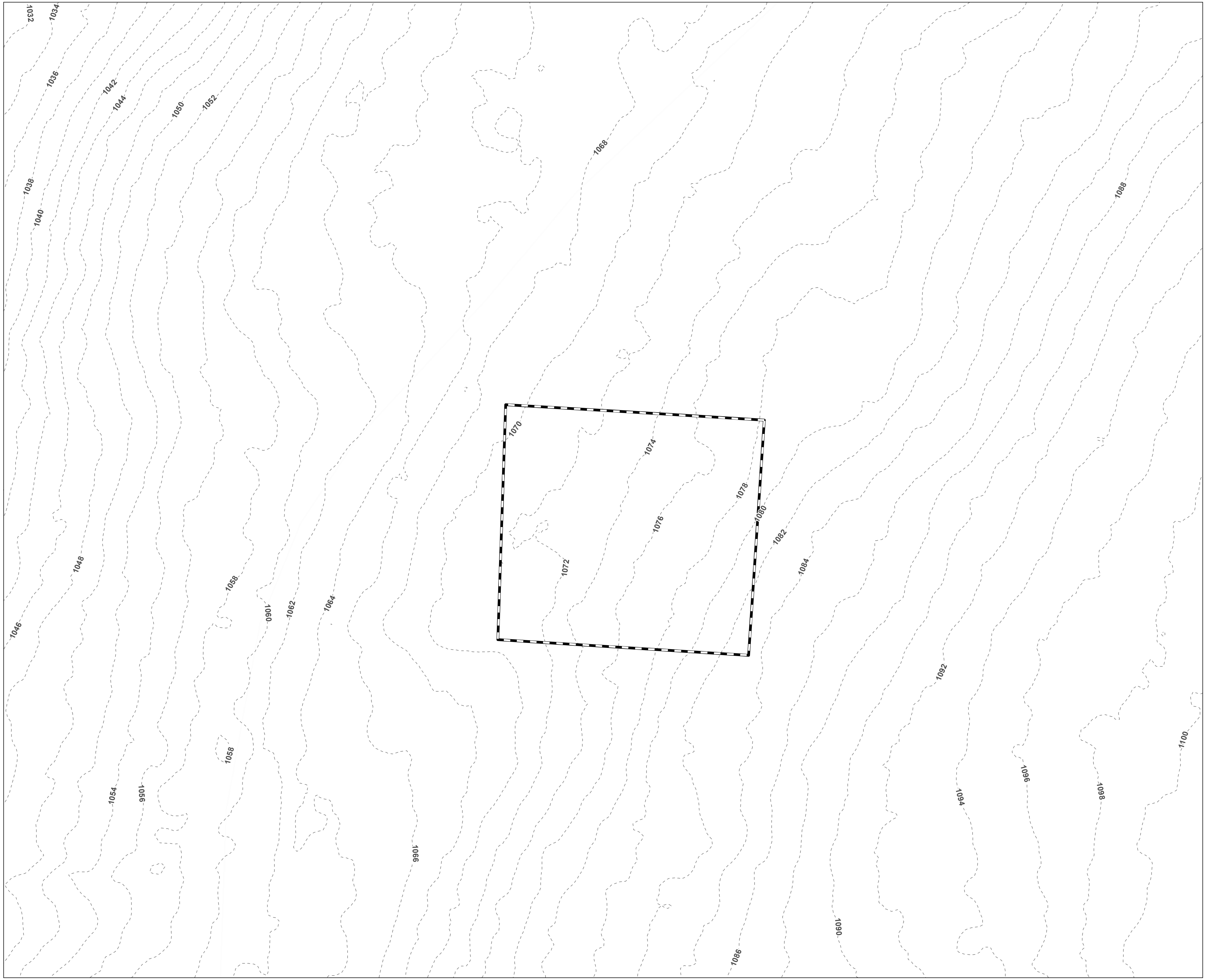
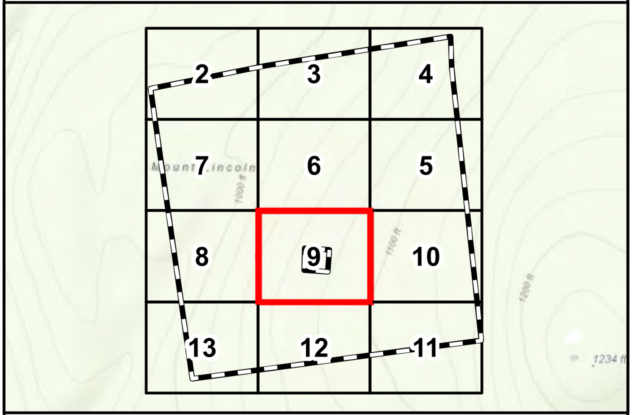


LEGEND

▨ PROJECT BOUNDARY

- - - 2-FT CONTOUR



NOTES:

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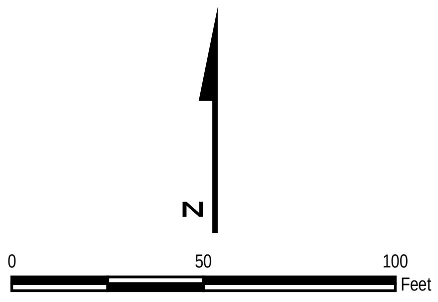

1:600

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY:	S. MOTURI	PROJ NO.:	387920
CHECKED BY:	M. LENNON	**FIGURE 1**	
APPROVED BY:	M. FIRSTENBERG		
DATE:	NOVEMBER 2020	Page 9 of 14	

TRC

650 SUFFOLK STREET
LOWELL, MA 01854

FILE NO.: TowerHill_ANRAD_SHEETS_11x17_20201105.mxd

Plot Date: 11/5/2020, 11:03:19 AM by SMOTURI -- LAYOUT: ANSI B(11"x17")
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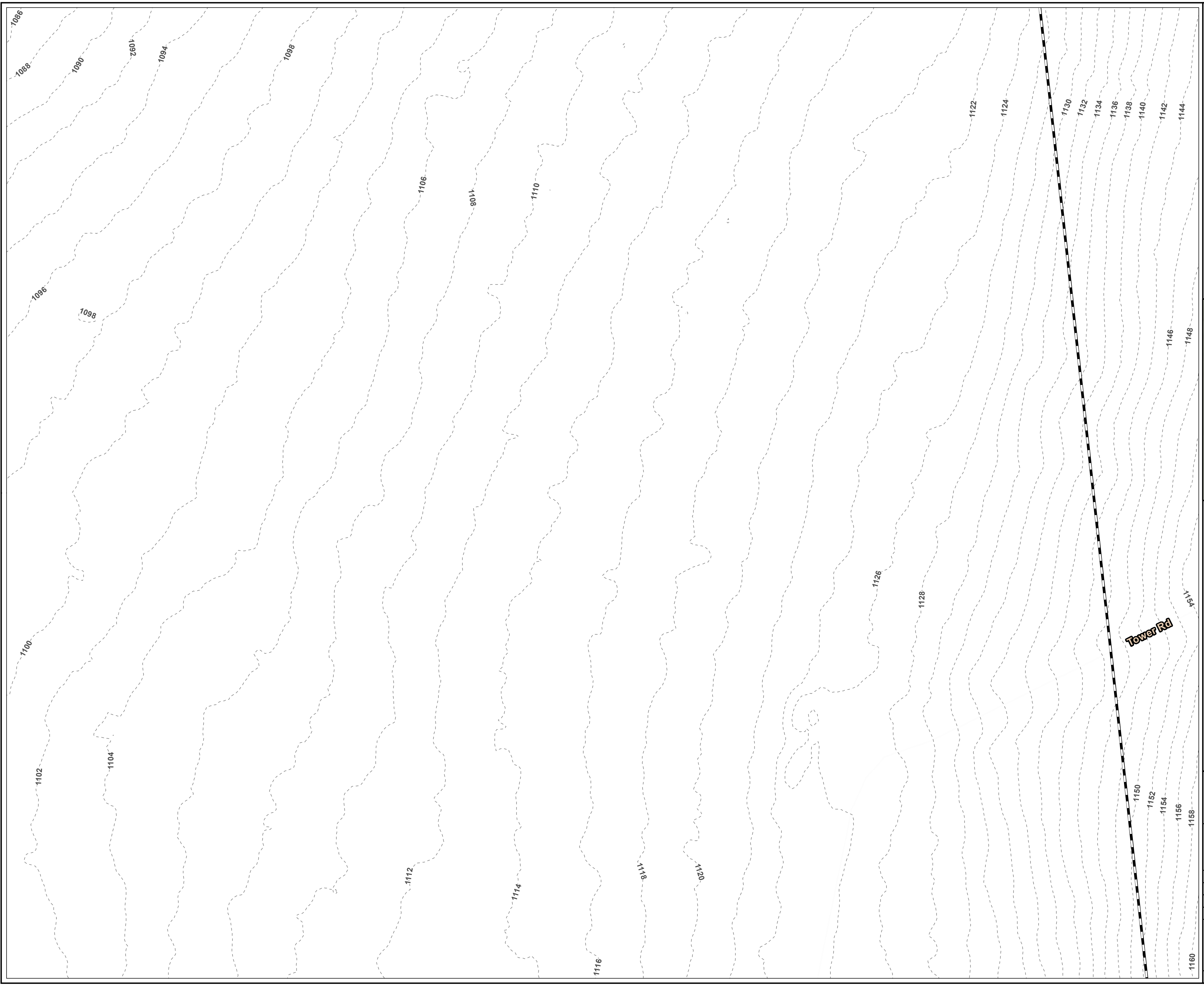
Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet (Foot US)
Map Rotation: 0

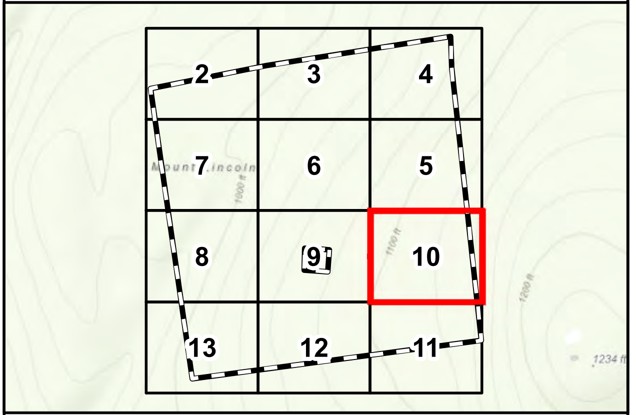
TRC - GIS



LEGEND

PROJECT BOUNDARY

2-FT CONTOUR



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N

0 50 100
Feet

1:600

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY:	S. MOTURI	PROJ NO.:	387920
CHECKED BY:	M. LENNON	**FIGURE 1**	
APPROVED BY:	M. FIRSTENBERG	Page 10 of 14	
DATE:	NOVEMBER 2020		

TRC

650 SUFFOLK STREET
LOWELL, MA 01854

FILE NO.: TowerHill_ANRAD_SHEETS_11x17_20201105.mxd

TRC - GIS

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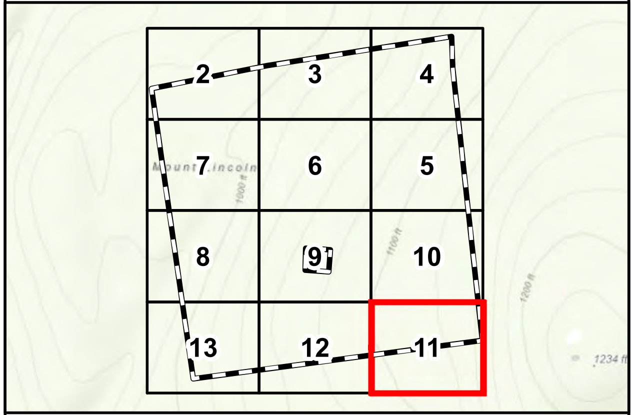
LEGEND

- PROJECT BOUNDARY
- 2-FT CONTOUR



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N

0 50 100
Feet

1:600

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

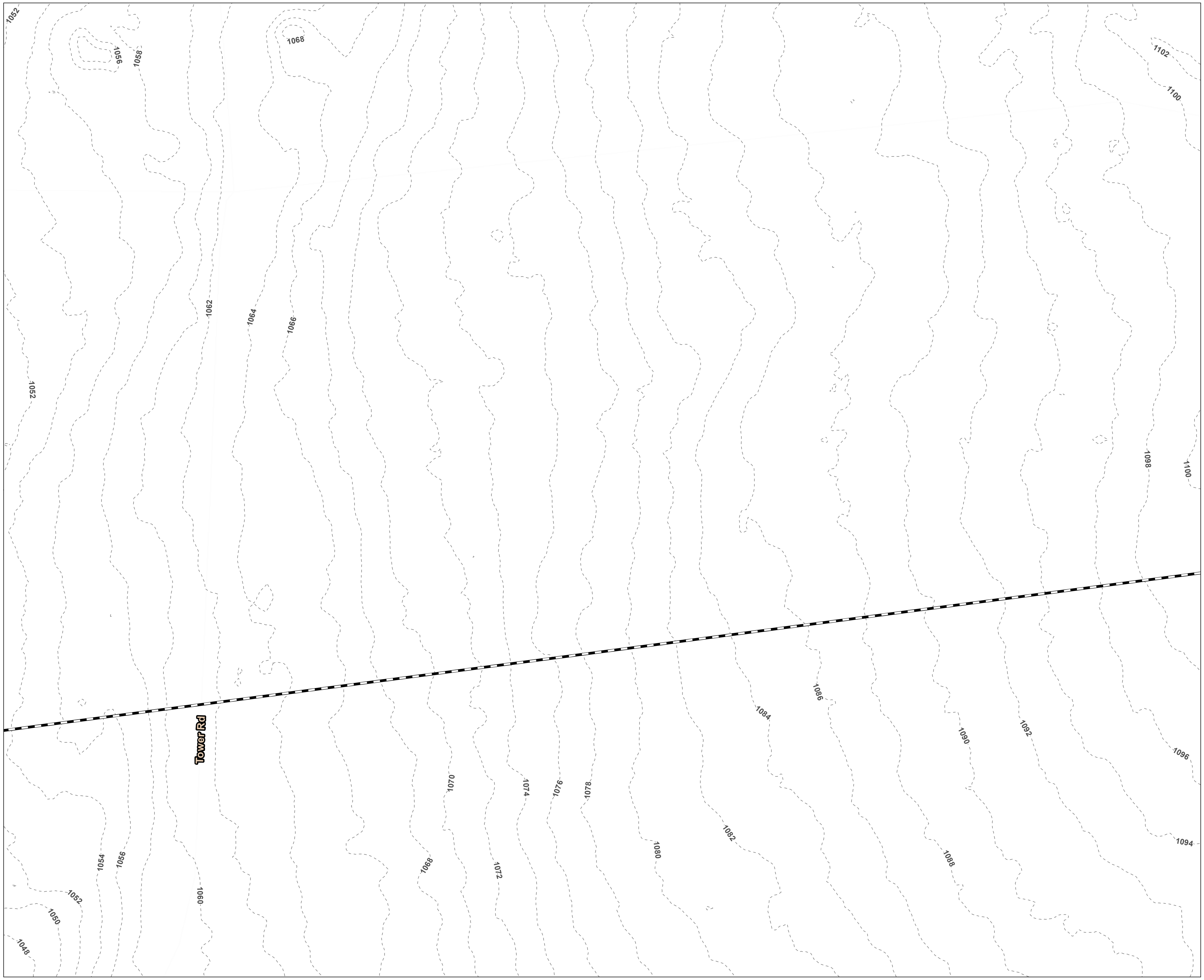
DELINEATED
RESOURCES MAP

DRAWN BY:	S. MOTURI	PROJ NO.:	387920
CHECKED BY:	M. LENNON	**FIGURE 1**	
APPROVED BY:	M. FIRSTENBERG		
DATE:	NOVEMBER 2020	Page 11 of 14	

TRC

650 SUFFOLK STREET
LOWELL, MA 01854

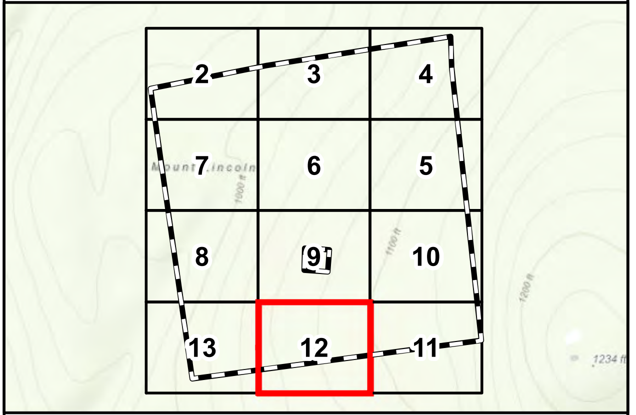
FILE NO.: TowerHill_ANRAD_SHEETS_11x17_20201105.mxd



LEGEND

▭ PROJECT BOUNDARY

┄ 2-FT CONTOUR



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N

0 50 100 Feet

1:600

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY:	S. MOTURI	PROJ NO.:	387920
CHECKED BY:	M. LENNON	**FIGURE 1**	
APPROVED BY:	M. FIRSTENBERG		
DATE:	NOVEMBER 2020	Page 12 of 14	

TRC

650 SUFFOLK STREET
LOWELL, MA 01854

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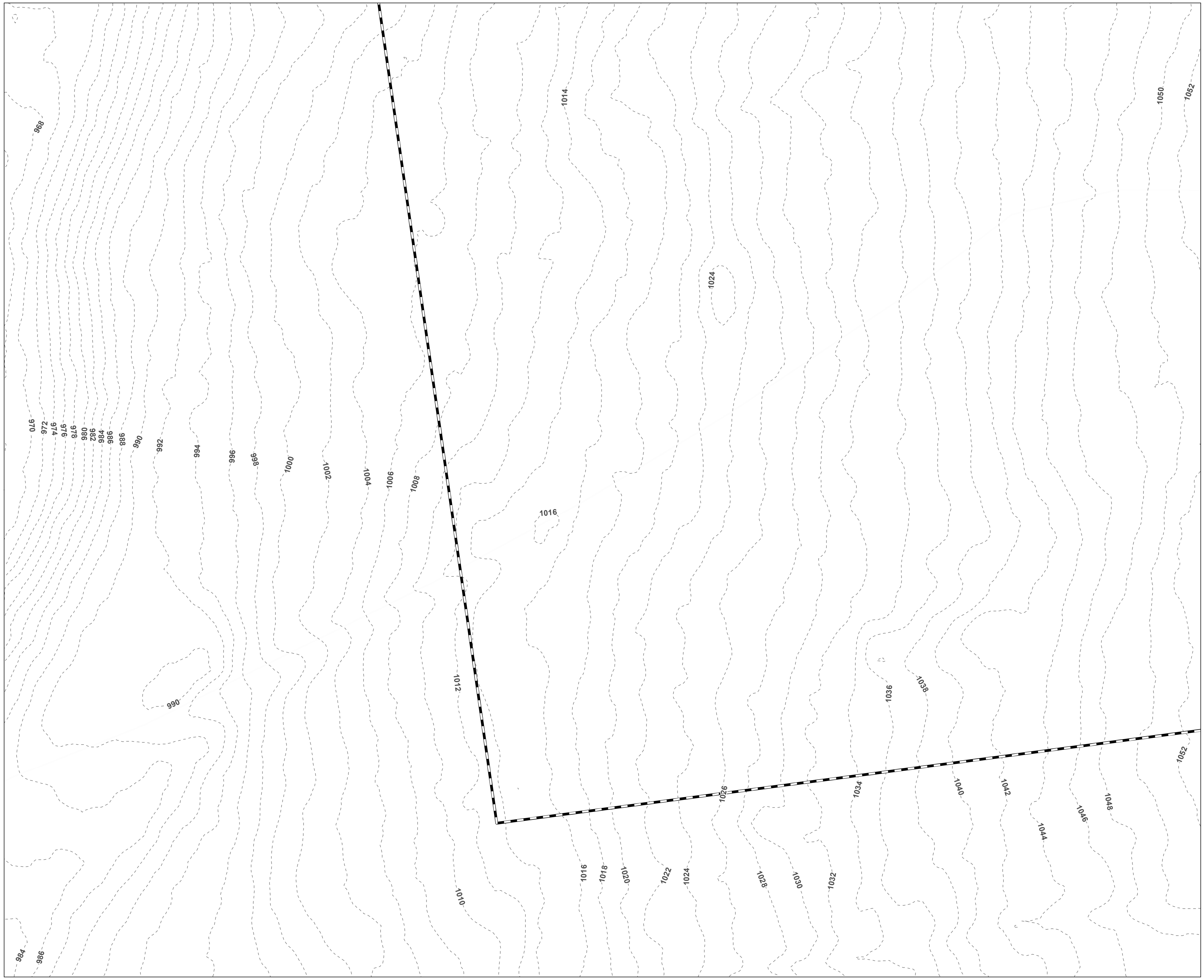
Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet (Foot US)
Map Rotation: 0

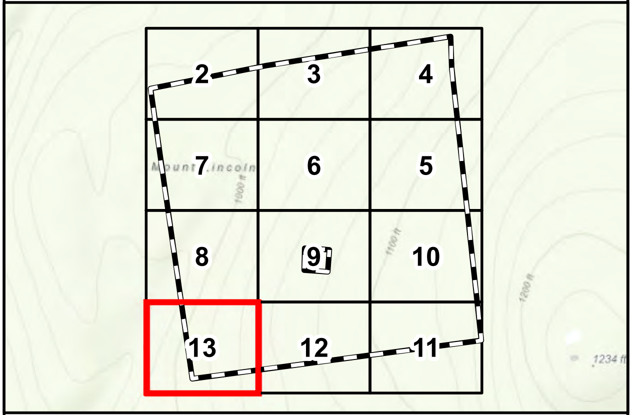
TRC - GIS



LEGEND

▭ PROJECT BOUNDARY

⋯ 2-FT CONTOUR



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N

0 50 100
Feet

1:600

PROJECT:

TOWER ROAD PROJECT
PELHAM, MASSACHUSETTS

TITLE:

DELINEATED
RESOURCES MAP

DRAWN BY:	S. MOTURI	PROJ NO.:	387920
CHECKED BY:	M. LENNON	**FIGURE 1**	
APPROVED BY:	M. FIRSTENBERG		
DATE:	NOVEMBER 2020	Page 13 of 14	

TRC

650 SUFFOLK STREET
LOWELL, MA 01854

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