

COMMONWEALTH OF MASSACHUSETTS
APPEALS COURT

TOWN OF HOPEDALE,)	
)	
Plaintiff,)	
)	
v.)	SINGLE JUSTICE
)	NO. 2022-J-0146
JON DELLI PRISCOLI and MICHAEL R.)	LAND COURT
MILANOKSI, as Trustees of the ONE)	NO. 20 MISC 000467 (DRR)
HUNDRED FORTY REALTY TRUST, and))	
GRAFTON & UPTON RAILROAD)	
COMPANY,)	
)	
Defendant.)	

AFFIDAVIT OF EDWARD J. BURT

Now comes Ed Burt, who on oath deposes and says as follows:

1. My name is Edward J. Burt. I am the Chair of the Town of Hopedale’s Board of Water and Sewer Commissioners (“WS Board”). I submit this Affidavit in support of the Hopedale Citizens’ Emergency Motion to Preserve Status Quo and Protect the Forestland Pending Land Court Appeal. For the reasons set forth below, acquisition and development by the Grafton & Upton Railroad (“Railroad”) of the c. 61 Forestland that is at issue in this case would cause irreparable harm to the Town of Hopedale and its residents.

2. Along with the other members of the WS Board, I have been intensely involved in efforts to protect the 130 acres of c. 61 forestland (“Forestland”) and 25 acres of wetlands (“Wetlands”) at 364 West Street, Hopedale, on behalf of the Town of Hopedale and the public since 2019. Preservation of the Forestland and Wetlands from development is essential to protection of both the Town’s current public water supplies and its future water supplies. The land is located within the watershed area which in its natural state protects and contributes to the Town’s public water supply. It is part of an extensive wetlands system, hydrologically connected to Hopedale’s existing public water supply. It has also been identified as a viable area for future water sourcing. The industrial development would have a hydrologic impact on the downgradient wetland system due to the lost ground water recharge. As explained below, the vast scale of the Grafton & Upton Railroad’s (“Railroad”) proposed development of the Forestland presents substantial, unacceptable risks to both the current and potential future water supplies of the Town.

3. The Railroad’s first attempt to acquire the Forestland and Wetlands was by use of a purported power of eminent domain via a Department of Public Utilities proceeding in 2019. Petition of Grafton & Upton Railroad Company for Authority to Acquire Property in Hopedale, Massachusetts, pursuant to G.L. c.160, § 83., Docket 19-39. The WS Board vigorously opposed this attempt, and moved

to intervene in the proceeding. A copy of the Motion to Intervene, with exhibits, is attached hereto as **Exhibit 1**. The WS Board also submitted a supplementary filing, a Fracture Trace Study, in support of its Motion, attached hereto as **Exhibit 2**. These filings demonstrate in detail and with strong evidentiary support the substantial adverse impacts to the Town's current and future water supplies posed by the proposed acquisition and development of the Forestland and Wetlands by the Railroad. The WS Board successfully intervened directly in the proceeding and was granted full party intervenor status. Since the decisions on parties' attempts to intervene, the matter has lain dormant. The WS Board was represented in the DPU proceeding by the law firm of Mackie Shea Durning, P.C. This same firm currently represents the Hopedale Select Board in the instant litigation.

4. Shifting gears, the Railroad attempted to acquire the Forestland by purchasing it from the Trust that owned it. Upon learning of the putative Purchase and Sale Agreement in July 2020, the WS Board again reiterated its strong concerns regarding the impact that the Railroad's development plans would have on the Town's current and future water supplies. The Town proceeded to evaluate the acquisition of the Forestland and Wetlands pursuant to c. 61. It engaged an environmental consulting firm, Environment Partners, who generated a Limited Desktop Site Screening Report dated October 22, 2020, a copy of which is attached hereto as **Exhibit 3**. The report at pp. 11-12 concludes that the Forestlands

“significantly increases the potential area for public water supply explorations,” and “provides additional protection for the Town’s existing public water supply sources.”

5. At the October 24, 2020 Special Town Meeting, the WS Board strongly advocated for acquisition of the Forestland pursuant to c. 61 and the Wetlands by eminent domain. The Town’s Conservation Commission and Finance Committee also strongly advocated for this acquisition. The Town Meeting vote was unanimously in favor of both acquisitions.

6. In late January 2021, the WS Board learned that the Select Board was considering settling the Land Court case on terms including acquisition of only 40 of the 130 acres of Forestland. The WS Board strongly objected, writing a letter dated February 5, 2021 to the Select Board, attached hereto as **Exhibit 4**, requesting that it “cease and desist from any further negotiations or agreements” with the Railroad regarding water rights for the Town of Hopedale. In its view, the WS Board believed that it had exclusive statutory control of all such water rights and exclusive statutory responsibility to protect the water supply and watershed, and that the proposed term sheet violated such control in numerous respects.

7. The Select Board proceeded to execute the Settlement Agreement over the WS Board’s objections, and then requested that the WS Board execute a Cost Sharing Agreement (attached hereto as **Exhibit 5**) pursuant to the Settlement

Agreement. Due to a number of unanswered questions regarding the effect of the Cost Sharing Agreement, and the overall Settlement being addressed by legal proceedings, the WS Board declined to respond regarding the Cost Sharing Agreement.

8. In connection with a Select Board meeting held on September 29, 2021, an application by the Railroad for public funding of the development work at the Forestland was made publicly available. At the meeting, Railroad President Michael Milanoski shared a Powerpoint slide showing plans for seven (7) warehouses to be located on the Forestland. This represented a vast expansion of previously-disclosed development plans for the site by the Railroad.

9. After the Superior Court ruled that Town Meeting approval of the acquisition of only 30 acres of Forestland under the Settlement Agreement required Town meeting approval, the WS Board advocated strongly to the Select Board that it proceed to enforce the Town's exercised and recorded c. 61 Option to acquire all of the Forestland. A copy of our December 20, 2021 letter to the Select Board is attached hereto as **Exhibit 6**. The letter stated, "regardless of the exact number of warehouses, it is evident that GURR will clear a significant portion of the Forest. An EPA estimate has calculated that the impact of the future MS4 burden caused by the lost watershed forestland to be more than a million dollars, plus costs associated with related water supply goals."

10. On February 18, 2022, the WS Board sent yet another letter to the Select Board conveying its strong “objection to GURR’s continued land clearing proposal within the 364 West Street property in the name of water supply well exploration.” A copy of the letter is attached hereto as **Exhibit 7**. We stated:

Most importantly, the negative impact to the current water supply caused by any more land clearing within the West St watershed would only exacerbate today’s water supply concerns and issues. This point cannot be emphasized enough.

The oversight of the water supply, watershed and water exploration is the Water & Sewer Commission’s legal responsibility. Please represent our decisions and opinions as part of the West St court proceedings accordingly. (emphasis in original).

11. On March 26, 2022, the Town held a Special Town Meeting. Warrant Article 8 by the Select Board sought to ratify the acquisition of the 40 acres of Forestland provided under the Settlement Agreement. I attended the Special Town Meeting and made a presentation against Article 8 on behalf of the WS Board. A copy of the Powerpoint slides I presented is attached hereto as **Exhibit 8**. As set forth in the slides, it is the strong position of the WS Board that “the magnitude of the RR development allowed by the Settlement does not provide the necessary protect[ion] to the current water supply. Nor does it provide the assurances to protect the area for a potential future water supply.” Slide 2. The rest of the slides set forth the evidence supporting our position. Thankfully, the motion on Article 8 was overwhelmingly defeated.

12. The WS Board urges the Court to preserve the status quo and prevent further destruction of the Forestland pending this appeal. This is necessary to protect the Town's current and future water supplies, which will be irreparably harmed by development of the Forestland.

/s/ Edward J. Burt

Edward J. Burt

CERTIFICATE OF SERVICE

I hereby certify that a true and accurate copy of the above document was served upon the attorney of record for each other party by efile and email on April 7, 2022.

/s/ Harley C. Racer

Harley C. Racer

Exhibit 1

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

D.P.U. 19-39

PETITION OF GRAFTON & UPTON)
RAILROAD COMPANY FOR AUTHORITY)
TO EXERCISE POWER OF EMINENT)
DOMAIN TO ACQUIRE PROPERTY IN)
HOPEDALE, MASSACHUSETTS)

MOTION TO INTERVENE

The Hopedale Board of Water and Sewer Commissioners (the "HBWSC") hereby moves for leave to intervene pursuant to 220 CMR 1.03(1) in the evidentiary phase of the above-captioned proceeding before the Department of Public Utilities (the "Department").

REASONS FOR INTERVENTION

Pursuant to 220 CMR 1.03(1)(b), the HBWSC states that it is substantially and specifically affected by the Petition of Grafton & Upton Railroad Company ("GURR"), which is seeking authority from the Department to exercise the power of eminent domain to authorize GURR to acquire certain real estate, which is located at 364 West Street, Hopedale, Massachusetts (the "Property"), as follows:

A. The Hopedale Board of Water and Sewer Commissioners

1. The HBWSC is located at Town Hall, 78 Hopedale St., Hopedale, MA 01747.
2. The HBWSC was established by the General Court under Chapter 578 of the Acts of 1982.
3. The individual commissioners on the HBWSC are selected to hold office by ballot during town elections.

4. Pursuant to Chapter 578 of the Acts of 1982, the HBWSC has all the powers and duties of water commissioners under G.L. c. 41, § 69B, including exclusive charge and control over the Town of Hopedale Water Department and the authority to establish a public water supply under G.L. c. 40, § 39A.

5. As the entity with statutory authority over the public water supply for the Town of Hopedale and the board charged with supervising the Town of Hopedale Water Department, the HBWSC is compelled to intervene in this action because the operation of the Hopedale Water Department and the availability of a public water supply for drinking water and fire prevention in the Town of Hopedale will be specifically and substantially affected by GURR's proposed taking of the Property.

6. Without limitation, the public water supply for the Town of Hopedale will be impacted by: (a) deleterious effects on the water quality of public drinking water in the Town from the extension of industrial activity on the Property, which is proximate to and hydrologically connected to Hopedale's existing public drinking water resources; and (b) the loss of potential public water supply resources located on the Property.

B. The Property

7. The Property is part of a large swath of undeveloped land located in the northern section of the Town of Hopedale.

8. The Property GURR wants to take by eminent domain is hydrologically connected to existing public water supply resources because the extensive wetland system on the Property is directly adjacent to the Zone II for Hopedale's current public water supply.¹

¹ The Zone II wellhead protection area is "[t]hat area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at safe yield, with no recharge from precipitation)." 310 CMR 22.02.

9. In addition to the impacts on Hopedale's existing public water supply resources, the proposed taking by eminent domain by GURR, will have an impact on the limited area where the HBWSC has targeted the most viable future public water supply resources.

10. Over time, Hopedale has commissioned numerous studies to address public drinking water needs in the Town. In a 2004 Water Assets Study, prepared by Earth Tech for the Town of Hopedale and the Massachusetts Executive Office of Environmental Affairs ("EOEEA"), Earth Tech developed several maps showing areas that would be suitable for future groundwater supplies. A complete copy of the 2004 Water Assets Study is attached as **Exhibit A**. For convenience, Map 3, Land Potentially Available for Future Groundwater Supplies and Map 4, Current Land Use in Potential Public Water Supply Protection Areas, are attached separately as **Exhibits B** and **C**. Map 3 and Map 4 vividly show how the Property GURR is seeking to take through eminent domain in the northwestern corner of the Town is one of the most significant resource areas for potential public water supply that remains in a natural state.

11. Consistent with the guidance from EOEEA identifying areas in town suitable for potential public water supply, Hopedale commissioned a fracture trace study to identify locations in the northern portion of the Town that may be suitable for establishing a groundwater well. Attached as **Exhibit D**, is a figure from a fracture trace study performed by the D.L. Maher Co., for HBWSC in or around 2005. The study identified several sites within the Property as advantageous locations for establishing groundwater wells for public drinking water. Unfortunately, the remainder of this particular fracture trace study has been lost due to the passage of time and extenuating circumstances.

12. To provide the Hearing Officer with a more comprehensive analysis of the critical importance of this portion of the Property for the Town of Hopedale's long-term public drinking

water needs, the HBWSC has commissioned a new fracture trace study that will be completed in early September 2019 by Geosphere Environmental Management, Inc. The HBWSC will seasonably update its filing with the Department when it receives this supplemental fracture trace study.

13. Hopedale's current need for an additional public drinking water supply is acute. In response to a proposal for a 556-unit residential development in 2018, the so-called Draper Falls Project, the Hopedale Water Department submitted formal comments to the Board of Selectmen and Planning Board on the viability of the Draper Falls Project. In the comments, the Hopedale Water Department observed that the construction of an additional water storage tank as part of the Project would be advantageous, but noted, "we still need the water to fill it." The letter continued to state that "[t]o supply an additional 556 units as we currently stand, would be very difficult and would certainly require water restrictions year-round. An additional source would be the best solution[.]" A true and accurate copy of the September 12, 2018 letter is attached as **Exhibit E**.

14. The Draper Falls Project letter demonstrates that Hopedale's limited existing water supply is having a direct impact on the viability of further residential or commercial development in Hopedale.

15. In addition to the need to increase water supply to support further growth and development of the Town, as the steward of Hopedale's water supply resources, HBWSC is mindful that its existing water supply is finite and vulnerable. Any water supply, particularly groundwater supply, can experience disruption due to drought, equipment failure, and impacts due to releases of hazardous materials. In particular, the water supply in several communities in Central Massachusetts have been impacted by pre- and perfluoroalkyl substances ("PFAS"), a

class of emerging contaminants linked with public health impacts. MassDEP is in the process of adopting regulations to establish regulatory standards for the notification, assessment, cleanup of PFAS at hazardous material disposal sites under the Massachusetts Contingency Plan, 310 CMR 40.0000 *et seq.*, (the “MCP”), and will be promulgating draft regulations to set Maximum Concentration Levels for drinking water later this year. Threats posed by PFAS and other contaminants can place restraints on public water supply and prudent emergency planning should include redundancy and alternate sources of public water supply.

16. Accordingly, securing access to land for the development of groundwater wells at the Property and preservation of the environment to ensure water quality in close proximity the Zone II of the Town’s existing well catchment areas is a top priority of the HBWSC. This initiative animates this Motion to Intervene and its success is critical for safe consistent water supply in Hopedale.

17. But for the limited intrusion of the single existing rail track, the Property is otherwise undeveloped. In 2012, the Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries and Wildlife (“NHESP”) performed a comprehensive assessment of Hopedale. Attached as **Exhibit F** is NHESP’s Bio Map 2, “Conserving the Biodiversity of Massachusetts in a Changing World”, study of Hopedale.

18. The BioMap 2 report identified two mapped areas within the Property that contain Wetland Core and noted that several Species of Conservation Concern, including the American Brook Lamprey, Marbled Salamander, and Eastern Box Turtle, are present within the area.

19. These critical natural resources would be impacted by GURR’s operations, if the Department grants the railroad control over these sensitive ecological areas.

C. The GURR Project

20. GURR is seeking authority to acquire over 150 acres of land through which a rail corridor already exists. GURR alleges in its Petition that the Property is not only reasonably necessary for conducting rail operation, but is “critical and essential to the ability of GURR to provide rail service that meets the demands of customers.” The Petition does not specify what operations it intends to conduct at the Property.

21. Indeed, the Petition broadly indicates that the Property *may* be used to “transload commodities from railcars to trucks, store railcars, switch cars moving to and from the transloading yards, maintain equipment and conduct other activities that are essential to the functioning and support of GURR’s rail operations generally.” However, this is not an adequate description of the *specific* intended use of the Property, sufficient to justify acquisition of the Property by eminent domain.

22. Although GURR asserts that the Property is suitable for its proposed expansion, according to the Petition states that the Property “has a topography that is not suitable for virtually any purpose without substantial cutting and filling work.”

23. In both the Petition and the August 7, 2019 Supplemental Information filing (the “Supplemental Information”), GURR failed to describe the exact nature, extent and location of the project cutting and filling work that it admits is necessary. Without this critical information, it is difficult to quantify the impacts on the wetlands and public water supply resources located near the Project site.

24. At a minimum, it is likely that there will be increased stormwater runoff from the Project. In addition to the prevailing topography that generally slopes down to a low point around the wetland system in the eastern portion of the Property, the altered site conditions will

decrease recharge through the natural environment and stormwater will be concentrated and potentially conveyed in a manner that could exacerbate harm to the wetland and public water supply resources.

25. As the industrial activity associated with the railroad operations extends closer to these wetland resource areas, as shown in the Hopedale Logistics Railyard plan, by Arthur F. Borden & Associates, Inc., dated June 26, 2019, which was included in the Supplemental Information, the impacts to the wetland and potential water supply areas will increase.

26. In its Supplemental Information, GURR did not satisfy the instruction to provide additional information regarding the Company's plans in the Hearing Officer's Procedural Memorandum, dated August 1, 2019. In the Supplemental Information, GURR submitted general statements regarding statewide rail activity, but provided scant information about the specific plans that necessitate a taking of this magnitude. GURR explained how it already has three fully operational terminals along its 16.5 miles of track, but it did not provide sufficient information in its filing to justify the taking of 155 acres of natural land to support additional railroad operations along this short rail spur.

27. GURR's plan in its Supplemental Information depicts the addition of 10 new tracks (5 on each side of the existing track), but the materials do not provide any justification for why this layout is "reasonably necessary" for its rail operations. Beyond the addition of more tracks straddling the existing line, GURR indicates that it "intends to construct a building on the Property," but it failed to describe the size or function of the building or to identify the intended location for the building facility. This presentation is woefully inadequate to grant the taking of 155 acres of land.

28. GURR's plans for the Property remain vague – even after being directed to submit the Supplemental Information by the Hearing Officer.² In particular, GURR has not provided any justification for taking that portion of the Property, which is adjacent to the extensive wetland system in the eastern portion of the Property. Accordingly, the Department should scrutinize the railroad's request for the entire 155 acres. The Department has discretion under G.L. c. 160, § 78 to impose limits on the extent of the taking by eminent domain.

D. The HBWSC Has Standing To Intervene in this Petition

29. Given the specific and substantive impacts to public drinking water resources from the proposed taking of the Property, the HBWSC is entitled to intervene in this matter.

30. Under G.L. c. 30A, § 10, in a state administrative proceeding, an agency "shall afford all parties an opportunity to full and fair hearing." Upon a showing that a party "may be substantially and specifically affected by the proceeding," an administrative agency may allow a person to intervene as a party.

31. Given the uncertainties surrounding GURR's intentions for the Property, at a minimum, the HBWSC should be permitted to intervene in this matter in order to engage in discovery with respect to the GURR's plans for the Property.

32. In addition, the HBWSC has responsibility to preserve and protect the water quality in Hopedale's existing water resources and a duty to provide adequate water supply.

33. The HBWSC has a duty to preserve and protect public drinking water resources and is concerned that GURR's development and use of the Property may adversely impact

² The Department should also take note of the fact that an affiliate of GURR, First Colony Development Co., Inc., has previously sought to develop the northeastern portion of the Property with a large residential development.² Attached as **Exhibit G**, is a copy of plan of land prepared for First Colony Development Co., Inc. showing a 29 lot residential development to the east of the existing railroad tracks. Though the precise nature of the affiliation between the two entities is not immediately clear, the most recent Annual Reports on file with the Secretary of the Commonwealth show that Jon Mark Delli Priscoli is listed as the President, Treasurer, Secretary, and Director of both companies. Copies of the filings are attached as **Exhibits H and I**.

Hopedale's existing and future public water supply resources for drinking water and fire prevention.

34. GURR currently conducts operations in the Town's Zone II Wellhead Protection Area, including its existing terminal in Hopedale. GURR's ownership and operation of facilities within the Zone II Wellhead Protection Area for Hopedale public drinking water resources has been the subject of numerous environmental actions, including (a) RTN 2-16184, where GURR received a Notice of Responsibility from MassDEP on April 14, 2006 related to a release (or releases) of chlorinated solvents; and (b) RTN 2-20041, where GURR received a Notice of Responsibility from MassDEP on December 8, 2016 for the detection of an elevated concentration of PCE in a monitoring well located just 3 feet away from the Mill River, an important hydrogeologic resource in the Town of Hopedale.

35. Though the source of the chlorinated solvent release was likely related to historic operations at the rail terminal property, GURR's failure to perform timely response actions likely contributed to the migration of the chlorinated solvents toward Hopedale's water resources.

36. During the course of conducting response actions under the MCP for RTN 2-16184, MassDEP issued two Notices of Noncompliance ("NON") to GURR for its failure to comply with the MCP including: (a) an NON, dated November 5, 2012, for failure to submit Phase II, Phase III, and Phase IV reports by the MCP deadlines, and for allowing its Tier 1C Permit to expire without receiving a permit extension; and (b) an NON on June 9, 2016 for continued failure to submit the documentation required under the MCP.

37. In addition to issues involving remediation of hazardous material releases on its property, GURR has recently been involved in proceedings before the Hopedale Conservation Commission and MassDEP regarding allegations that the company altered land in riverfront area

and other wetland resource areas without complying with local and state regulations governing work in protected natural resource areas. In those proceedings, GURR took the position that as railroad, GURR is exempt from any obligation to comply with such environmental regulations.

38. As the stewards of Hopedale's public water resources, HBWSC is concerned about GURR's Petition to take 155 acres of land near critical drinking water resources and containing potential public water supply resources. The open-ended nature of GURR's disclosures regarding its intended operations at the Property, and its record of lax compliance with remedial obligations under the MCP, and its disregard for environmental regulations governing work in wetland resource areas, increases HBWSC's concern for the impacts on the environment, in general, and the public drinking water resources, specifically.

39. These concerns will be significantly increased should GURR acquire additional property for expansion purposes, as an area within the Property has been identified through studies to be a viable source for future water sourcing.

40. Acquisition of the Property by the GURR may thus eliminate a viable public water supply for Hopedale.

41. HBWSC has a duty and responsibility to ensure adequate water supply for clean drinking water and ample fire protection for the residents and businesses of Hopedale. The proposed acquisition of the Property by eminent domain jeopardizes present and potentially future water sources.

42. The HBWSC's interest in the Property and the impacts of GURR's intended use upon Hopedale's current and potentially future water resources, is well documented, and is a strong basis to grant the HBWSC's Motion to Intervene.

43. The particular interests of the HBWSC, as set forth above, will not be represented adequately, unless the HBWSC is allowed to intervene in these proceedings.

RELIEF SOUGHT

HBWSC seeks relief in the form of an Order, which establishes whether GURR's request to exercise the power of eminent domain to acquire the Property is "reasonably necessary" for the "proper construction and security" and the "convenient operation" of GURR, and which takes into account HBWSC duty and obligation to protect existing and potential future public water supply for drinking water and fire prevention.

GURR has not, and HBWSC asserts cannot, justify the taking of all 155 acres of previously undisturbed natural land for the "convenient operation" of services along its 16.5 miles of rail line. GURR's failure to identify its specific development plans in its Supplemental Information filing is a telling hallmark that the railroad does not need the entire parcel for its operations. Even if the Department is inclined to permit a taking by eminent domain for the expansion of railroad operations, it should not award the entire parcel to GURR.

To the extent the Department is inclined to accommodate a taking of a portion of the Property, HBWSC seeks an Order limiting the taking to that will encroach on public water supply resources. While still not ideal for maximizing conservation of critical species habitat and minimizing impacts on water supplies, reducing the taking to a small area west of the existing railroad tracks would preserve the extensive wetlands system and limit impacts to the area that have been identified as a potential future public water supply.

Given the importance of the Property for Hopedale's existing and future public water supply, HBWSC hereby formally seeks an Order from the Department awarding a taking or alternatively an easement for a portion of the Property for the protection of existing water supply

areas and the development of future public water supply resources within the Town of Hopedale. Protecting and preserving these critical public water supply resources is central to the HBWSC's statutory duty and crucial for the public health, safety and welfare of the residents and businesses of Hopedale that require clean safe drinking water and ample water supply for fire prevention.

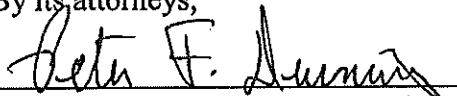
NATURE OF EVIDENCE TO BE PRESENTED

The HBWSC will present evidence regarding GURR's current operations within Hopedale's existing Zone II Wellhead Protection Area and the environmental impacts of additional operations if GURR is permitted to acquire and operate at the Property. The HBWSC will also provide information regarding the impacts from GURR's proposed operation on Hopedale's existing and proposed public water supply including, but not limited to, the pending updated fracture trace study that will demonstrate the nature, extent, and location of the viable public water resources located on the Property.

WHEREFORE, the HBWSC requests that it be allowed to intervene in the evidentiary phase of this proceeding. In the alternative, the HBWSC requests that it be allowed to participate in the proceeding upon such terms and conditions as the Department may order.

PETITIONER,
HOPEDALE BOARD OF WATER AND SEWER
COMMISSIONERS

By its attorneys,



Peter F. Durning (BBO #658660)

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pfid@lawmso.com


Dated: Aug. 30, 2014

CERTIFICATE OF SERVICE

I, Peter F. Durning, hereby certify that I have served a copy of the foregoing Petition to Intervene of Hopedale Board of Water and Sewer Commissioners, by electronic mail and by first class mail postage prepaid upon counsel on the Department of Public Utilities Service List:

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Peter F. Durning

Dated: Aug. 30, 2019

EXHIBIT

A

Water Assets Study

Town of Hopedale, Massachusetts
Community Report

Prepared for:

The Town of Hopedale

and

The Massachusetts Executive Office of Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Prepared by:

Earth Tech
196 Baker Avenue
Concord, MA 01742

June 2004

This Project is funded by the Executive Office of Environmental Affairs

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Appendix B – Federal and State Funding Programs for Water Supply Improvements

Appendix C – Methodology

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1. Project Background and Goals

The Massachusetts Executive Office of Environmental Affairs (EOEA) has, as a primary mission, the enhancement, preservation and protection of the Commonwealth's natural resources and its scenic, historic and aesthetic qualities. Water is one of the state's most important natural resources, as it sustains human and all other life, and careful planning is required to ensure that our water resources are protected for existing and future generations. Along the Interstate 495 beltway, water resources are under considerable pressure from growth that has occurred over the last 30 to 40 years and accelerated during the last ten years. As a reflection of the increasing strains on water supplies and ecological resources statewide, communities are facing increasing regulatory constraints in water supply permitting. If adequate water supplies are to be available to support new development and preserve existing ecosystems, water resources assessment and planning are essential.

Through this Water Assets Study, EOEA is taking an important step toward assessing the water resources in the communities along the I495 beltway, and helping these communities plan for the sustainable management of these resources. EOEA's town-by-town Buildout Analyses, which were completed in 2001, identified the developable land remaining in each community, as defined by existing zoning, and some of the infrastructure and services that would be needed to support potential development. Through the buildout analyses, the additional water demand for each community was estimated for full buildout conditions. While these conditions are neither inevitable, nor necessarily desirable, they represent a worst-case scenario of sorts, with respect to pressure on resources. The water demand projections were intended to raise community awareness about potential future water demands and encourage communities to plan future development in accordance with available water resources. The Water Assets Study is the next step in this analysis, helping communities more specifically assess their water supply capacity, sustain their current sources, and protect land that may be valuable for future groundwater supplies. Ultimately, the data from this study will be used along with an assessment of the ecological impact of withdrawals to identify the need for additional sources to meet existing and proposed demand, potential sources of supply, and as a means to help sustain the Commonwealth's fresh water resources.

The overall goal of the Water Assets Study is to assess the current and potential water supply capacity and the current and potential water demands in communities in the highest growth area of the Commonwealth. The assessment is intended to provide a framework for long-term public water supply planning, and protection of essential ecosystems. In particular, attention is paid to the role water conservation and water supply protection can play, as critical to managing and sustaining the water resources of the region.

The Water Assets Study is expected to benefit municipalities by:

- Helping communities protect existing water supplies and identify land that may be critical for future supplies
- Raising public awareness of current and future pressures on water resources
- Fostering intra-municipal communication on water resources issues
- Raising local support to conserve water and protect water-supply areas (Zone II's and Zone B's)
- Helping determine whether each community has sufficient supply – both current and future – to meet its long-term demand.

For the Commonwealth, the Water Assets Study is expected to:

- Assess whether the existing water-supply infrastructure in the study area is adequate to meet current and future demands
- Identify critical "hot spots" where demand might exceed sustainable supplies
- Identify potential water-conservation and regional cooperation strategies that would help protect essential ecosystems, while still meeting human water demands.

2. Overview of Hopedale and its Water Supply

Watershed Location

Hopedale, with a total area of 5.3 square miles, is partly in the Blackstone River Watershed and partly in the Charles River Watershed. 80% of the town's area, representing 4.3 square miles, is in a low stress portion of the Blackstone River Watershed. 20% of the town's area, representing 1.1 square miles, is in a medium stress portion of the Charles River Watershed. In general terms, the EOEA "stressed watershed" designations refer to broad regions, and reflect the relative quantity of stream flow in these watersheds or sub-watersheds in comparison to other watersheds in the state.¹

Growth and Development

Hopedale is home to about 6,000 people.² Approximately 42% of the town's area is developed, and 29% can still be developed.³ The remaining 29% of the town's area is protected or constrained from development. In terms of area, therefore, the town is 59% built-out. The population went from 5,666 to 5,907 in the decade between 1990 and 2000, a gain of 4%.⁴ The population projected for the town under build-out conditions is 6,821. In terms of population, therefore, the town was 87% built-out in 2000. The EOEA build-out also projects an additional 2,745,426 square feet of commercial/industrial growth. Of course, the rate of growth will probably not remain constant, and various factors including land protection, zoning changes, infill development and/or denser development than what is allowed as-of-right by zoning could push the ultimate build-out population and commercial development numbers up or down.

Water Supply

52% of Hopedale's area is served by a single public water supplier, Hopedale Water Department. Hopedale Water Department obtains water from 2 groundwater sources in Hopedale. They purchase water from Milford Water Company.

Regulatory Programs

The public water supply system described above and analyzed below is subject to regulation through the Department of Environmental Protection (DEP) **Drinking Water Program**. This program ensures that the drinking water delivered by public water systems in Massachusetts meets all national and state standards. As the U.S. Environmental Protection Agency's (EPA) Primacy Agent for the federal Safe Drinking Water Act in Massachusetts, the DEP Drinking Water Program regulates water quality monitoring, new source approvals, water supply treatment, distribution protection, and reporting of water quality data.

The Drinking Water Program also coordinates with the Massachusetts Water Resources Commission and the Department of Conservation and Recreation in regulating the *quantity* of water used for drinking water supplies and in requiring water conservation. Much of the regulation of drinking water withdrawals, and the promotion of water conservation, is administered under the **Water Management**

¹Statistics used to rank basin stress included median annual 7-day low flow, median annual 30-day low flow, and median annual low pulse duration. The more flow-stressed a basin is, the more extensively stream flow may be investigated when establishing new sources of water supply within the region, and the more emphasis will be placed by the regulatory community on conservation for the purposes of restoring flows to the stream system. However, site-by-site analysis would be required to determine the specific impact of a water supply source on nearby stream flow, as well as the extent of flow stress that exists in a localized area.

² This figure is a linear interpolation from decennial Census figures.

³ These figures are from the 2000 Census, photointerpretation of land use in 1999, and protected open space.

⁴ U.S. Census Data

Act⁵. As the emphasis of this report is on water supply quantity and capacity, the analysis will consider the specific regulatory constraints imposed on Hopedale's public water suppliers under the Water Management Act.

Water Supply Analysis

The analysis of Hopedale's water supply resources that follows uses data from the Department of Environmental Protection (DEP) and data collected in interviews with the 1 major public water supplier in Hopedale. Specifically, the report addresses the following questions:

- In meeting average daily demands over the course of a year, how close does Hopedale's public water supplier come to its annual withdrawal limits as regulated under the Water Management Act (WMA)?
- In meeting demands during the month with the most water use, how close does Hopedale's public water supplier come to exceeding its pumping capacity and its daily withdrawal limits (Zone II limits for wells and treatment capacity for some surface sources), as regulated under the Water Management Act?
- How well could Hopedale's projected average daily demands under full buildout conditions be met with existing (and potential future) physical and regulatory supply capacity?
- What, if any, additional significant demand is being placed cumulatively on Hopedale's water resources by non-public supply systems, such as industry and agriculture, and very small public systems?
- What are the infrastructural or physical limitations facing Hopedale's public water supply system, and what system improvements are currently proposed?

Following the analysis of Hopedale's existing supply capacity, the report addresses several questions concerning the potential impact of future land development on Hopedale's existing supplies and on areas that Hopedale may hope to develop into groundwater supplies in the future. This analysis may guide communities in land protection strategies around existing or potential future water supplies. A series of maps and accompanying analyses address the following questions, specifically:

- What are the existing land uses within Hopedale's water-supply protection areas (WSPA's) (Zone II's for wells and Zone B's for surface sources), and how much land within these areas is still "developable"?
- What are the likely future land uses of these "developable" areas, according to existing zoning laws?
- What areas of Hopedale are currently far enough away from developed land or otherwise restricted areas to *potentially* meet "new source approval" siting requirements for new groundwater supplies?
- At a broad brush scale, where do these areas appear to coincide with sand and gravel aquifers, and where do they appear to coincide with sensitive environmental areas, *both* of which are likely to impact an area's suitability as a new well site?
- What are the existing land uses within these potential well sites and their associated Zone I protection areas, and what are the likely future land uses in these areas, according to existing zoning laws?

Lastly, the report addresses how well Hopedale's water supplier currently conforms to water conservation guidelines and performance standards defined by the Massachusetts Water Resources Commission, and what potential water savings could be achieved by meeting certain guidelines and performance standards.

⁵ M.G.L. c. 21G, with regulations under the Massachusetts Water Resources Management Program, 310 CMR 36.00

3. Water Assets Analysis for Hopedale

3.1: Supply and Demand

3.1.1. AVERAGE DAILY DEMAND VERSUS WATER MANAGEMENT ACT (WMA) REGULATED ANNUAL WITHDRAWAL CAPACITY:

In meeting average daily demands over the course of a year, how close does Hopedale's public water supplier come to its annual withdrawal limits as regulated under the Water Management Act (WMA)?

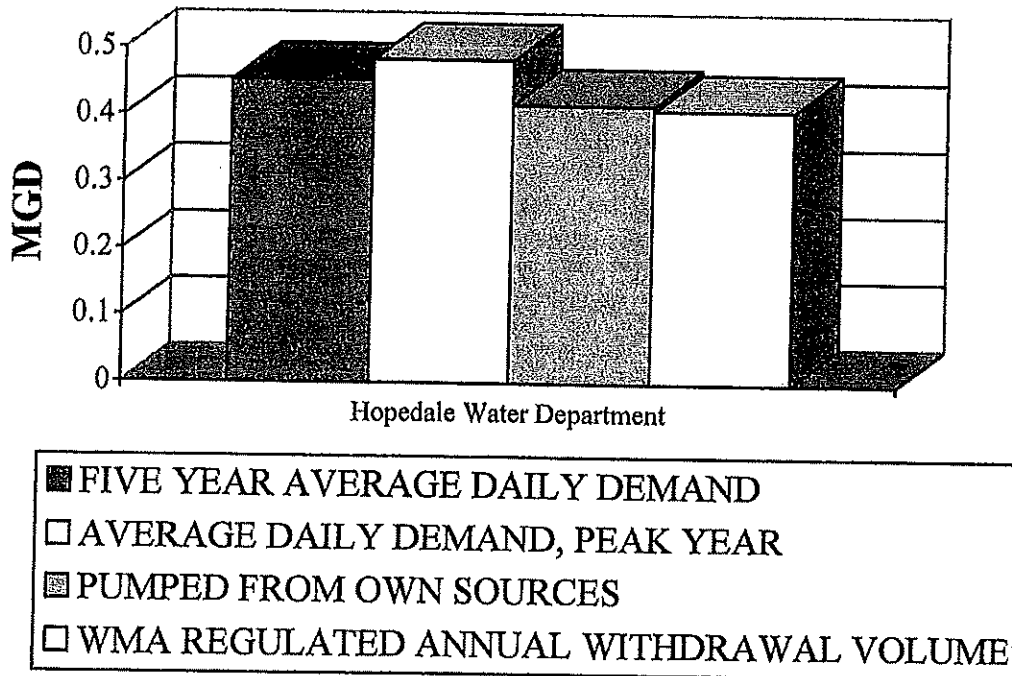
Under the Water Management Act (WMA), each supplier has a total annual withdrawal limit for the system as a whole – that is, all its sources combined. This may be a *registered volume* or a *permitted volume*, or some combination of the two. In 1985, when the WMA was passed, existing suppliers were given the opportunity to “register” their existing use by 1988, and this volume then became allowable under the WMA as the *registered volume*. Suppliers that failed to register by that time, constructed new withdrawal points since the passage of the WMA, or have needed to increase withdrawal volumes above the registered volume, need a permit under the WMA. These volumes are referred to as *permitted volumes*. The total regulated withdrawal volume for a given supply system under the WMA includes any *registered volumes*, plus any additional *permitted volumes* above the registered amount. This total is referred to below as the **WMA regulated annual withdrawal volume**, and is expressed as an average daily demand (millions of gallons per day (mgd)). It represents the total annual capacity of a supply system from the existing regulatory perspective.

In this section, we look at average daily demands over the five year period from 1998 through 2002, and in the single year during that period in which there was the greatest consumption of water. As some of this demand may have been met through water purchased from other systems, and additional water may have been pumped to sell to other systems, we subtract purchased water and add sold water to total demand to determine actual volume pumped. We compare both the total demand and the total pumped volume to the WMA regulated annual withdrawal volume.

HOPEDALE WATER DEPARTMENT

In the five years between 1998 and 2002, the Hopedale Water Department customers consumed 828.1 million gallons of water, which translates to an average daily demand of 0.45 mgd over the five-year period. During these five years, the greatest annual consumption for the Hopedale Water Department occurred in 1998. In that year, the Hopedale Water Department customers consumed 177 million gallons of water, which translates to an average daily demand of 0.48 mgd. An average of 0.42 mgd was pumped from the Hopedale Water Department's own sources during this year, representing 102% of the regulated annual withdrawal volume of 0.41 mgd allowed under the WMA. (See Figure 1)

Figure 1: Average Daily Demand versus Water Management Act (WMA) Regulated Annual Withdrawal Capacity



3.1.2. AVERAGE DAILY DEMAND IN PEAK MONTH VERSUS DEP APPROVED DAILY VOLUMES AND PUMPING CAPACITY

In meeting demands during the month with the most water use, how close does Hopedale's public water supplier come to exceeding its pumping capacity and its daily withdrawal limits (Zone II limits for wells and treatment capacity for some surface sources), as regulated under the Water Management Act?

In addition to comparing demand versus regulatory capacity on an annual basis, communities must also address whether they are able to meet sharp spikes in demand over short periods of time. Through DEP's Drinking Water Program, including regulation under the WMA, most groundwater sources have individual daily volume limits. These are based on DEP's determination of the volume of water that can safely be extracted from a given source during a single day without depleting the aquifer or resource, without imperiling drinking water quality, or in some cases, without imperiling sensitive environmental resources. These are referred to as *Zone II limits or DEP Approved Daily Volumes* and are expressed in millions of gallons per day (mgd). DEP has historically not assigned a *maximum* daily limit for surface water source withdrawals, but has instead identified the *firm yield* of the source(s), which is an *annual average* daily limit. However, some permits for surface water source withdrawals have identified the treatment plant capacity as the Approved Daily Volume and this serves as a daily regulatory limit. If all sources in a system have DEP Approved Daily Volumes, these volumes by source are summed to provide the **total DEP Approved Daily Volume** by system, which represents the daily capacity of a supply system from the existing regulatory perspective.

Additionally, suppliers may feel that they have limits to the volumes they are able to safely pump during a single day, due to treatment capacity, pumping infrastructure, and/or operational limitations which may

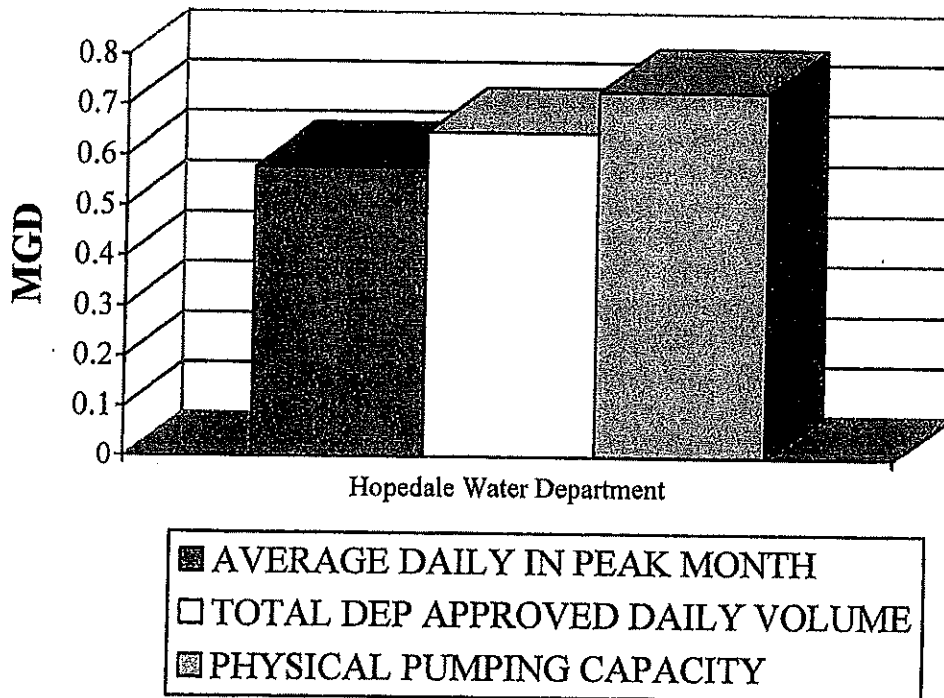
not be sufficiently reflected in the DEP Approved Daily Volume. Volumes intended to reflect these limits are referred to collectively as the **physical pumping capacity**. *This capacity relies on several assumptions and may vary from year to year, so communities may find it useful to tailor the analysis below to look at physical capacity from a variety of perspectives, according to different sets of assumptions and circumstances. Additionally, this number does not reflect any potential storage in a system, which may be able to supplement yield on a very short term basis.*

In this section, we look at daily demands during the single month of greatest water consumption between 1998 and 2002. From a planning perspective, daily use over the course of a peak month, rather than during a single peak day, better reflects sustained demand over short periods of time and avoids reacting to distorted demands that result from isolated events, such as large fires. We compare this daily demand in the peak month to the total DEP Approved Daily Volume and the physical pumping capacity. Note, however, that the physical pumping capacity may not be able to be sustained over a full month.

HOPEDALE WATER DEPARTMENT

In the five years between 1998 and 2002, the Hopedale Water Department's peak month consumption occurred in 1998. The average daily demand in that peak month was 0.58 mgd, which is 79% of the total physical pumping capacity of 0.73 mgd available from the existing Hopedale Water Department supplies [and 89% of the total DEP Approved Daily Yields of 0.65 mgd for all sources]. Note that the Hopedale Water Department purchased 24 million gallons of water in 1998 from other water suppliers. While data on the portion of the peak month's consumption that was purchased from other water suppliers was not available for the purposes of this study, such figures should be examined to meaningfully compare daily demand during peak month with the DEP Approved Daily Volumes and pumping capacity. (See Figure 2)

Figure 2: Average Daily Demand in Peak Month versus DEP Approved Daily Volumes and Pumping Capacity



Water Management Act Conditions

In addition to regulating total annual withdrawal volumes and daily maximum volumes, under the WMA DEP may also place special restrictions or conditions on specific sources, groups of sources, or whole systems based on site-specific environmental concerns. In some cases these conditions place further regulatory limits on withdrawal volumes, beyond the baseline WMA regulated annual withdrawal volume referenced above, particularly during specified times of year or when environmental conditions drop below a certain threshold – for example, when nearby stream flows drop below volumes determined to be necessary to sustain critical habitat. From a planning perspective, these special conditions under the WMA may be an additional important consideration for a supplier, especially in planning to meet peak demands, as peak demands most frequently coincide with the dry summer season, when special conditions are most likely to come into effect.

The following summarizes the WMA conditions placed on the operation of the Hopedale Water Department water-supply source(s):

Water Supplier:	Number of Sources with WMA Conditions
HOPEDALE WATER DEPARTMENT	0

3.1.3. EOEА PROJECTED BUILDOUT DEMAND VERSUS WMA REGULATED ANNUAL WITHDRAWAL CAPACITY AND DEP APPROVED DAILY VOLUMES

How well could Hopedale’s projected average daily demands under full buildout conditions be met with existing regulatory supply capacity?

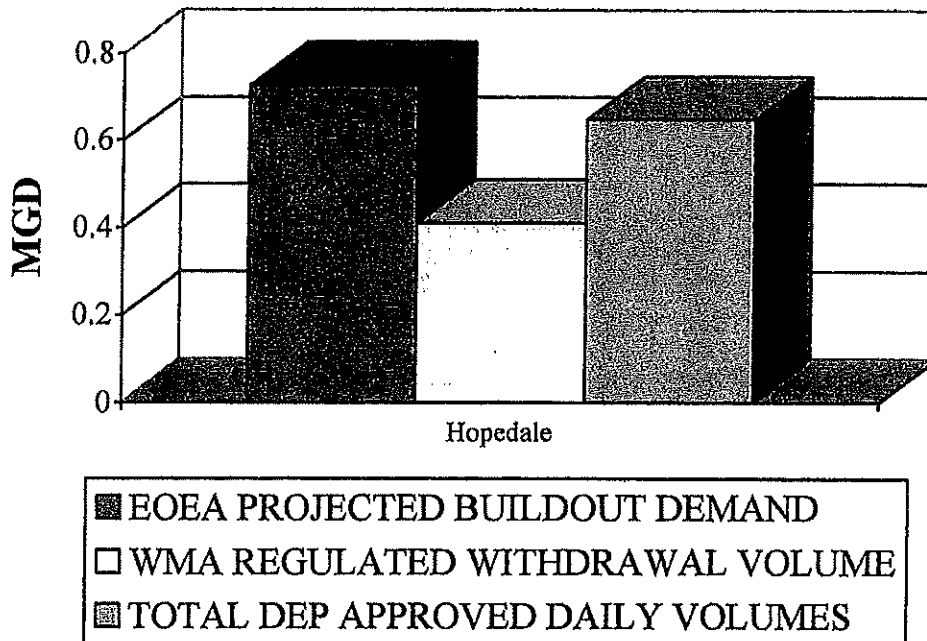
EOEA's town-by-town Buildout Analyses, completed in 2001, identified the developable land remaining in each community, as defined by existing zoning, and some of the infrastructure and services that would be needed to support potential development. One analysis estimated the additional water demand associated with "full buildout conditions" for each community – that is, the condition of having all land fully developed according to existing zoning. This demand is referred to below as **projected buildout demand**. As described above, these conditions are neither inevitable, nor necessarily desirable, but they represent an extreme-case scenario, with respect to pressure on resources.

In this section, we look at projected buildout demand for the whole town of Hopedale and compare this demand to the WMA regulated annual withdrawal Volumes and the total DEP Approved Daily Volumes for the water supply system in Hopedale. Note that the buildout demand discussed below assumes that at buildout, all water users in Hopedale – that is, all homes, all industry, all businesses – would be connected to public water supply. Due to physical, financial, political or other reasons, this condition may never come to pass. Some water users currently supported by private wells will remain so, while others may convert to public water supply. Therefore, the buildout demand represents a conservative figure for planning purposes.

Town of Hopedale Buildout Water Demand

The EOEA projected buildout demand for Hopedale, as a daily average, is 0.73 mgd. This represents 177% of the total WMA regulated annual withdrawal volumes for the Hopedale Water Department (0.41 mgd) and 112% of the total DEP Approved Daily Volumes for the system (0.65 mgd). (See Figure 3)

Figure 3: EOEA Projected Buildout Demand versus WMA Regulated Annual Withdrawal Capacity and DEP Approved Daily Volumes



3.1.4. EOEА PROJECTED BUILDOUT DEMAND VERSUS POSSIBLE FUTURE CAPACITY

How well could Hopedale’s projected average daily demands under full buildout conditions be met with potential future physical supply capacity?

Some communities have already identified potential new sources of water supply. These sources may add supply capacity, or – in cases where regulatory constraints would prevent increasing volumes system wide – they may simply increase operation flexibility. In the latter case, the new source could potentially still effectively bolster supply capacity, by providing redundancy for sources that suffer operational failures, water quality contamination, or limitations triggered by source-specific environmental concerns.

In this section, we report any potential new sources currently under development or sufficiently far along in investigation that they may factor into planning. Note that any potential yields described below are estimates that may not reflect actual volumes attainable if the source were to be developed.

HOPEDALE WATER DEPARTMENT

The Hopedale Water Department has identified no potential well sites.

3.1.5. MINOR PUBLIC WATER SUPPLIES AND NON-COMMUNITY WATER SUPPLIES

What, if any, additional significant demand is being placed cumulatively on Hopedale’s water resources by non-public supply systems, such as industry and agriculture, and small public systems?

Minor public water supplies (PWS) are defined, for the purposes of this study, as those whose demands do not meet the Water Management Act reporting threshold of 100,000 gallons per day (gpd). Non-community supplies that meet the Water Management Act threshold include systems permitted individually for uses such as agriculture, industry, golf courses, etc. Table 1 shows the total annual demand in 2002 from each source, in million gallons (MG), for both the minor PWS’s and non-community systems in Hopedale.

While these systems do not currently rely on the major public water supplier analyzed above to meet their demand, they may be withdrawing water from some of the same hydrologic resources. These systems are not analyzed in depth for the purposes of this study, but the tabulation of their cumulative annual withdrawal volumes is meant to provide communities with a general sense of additional demand being placed on the water resources of Hopedale. Note that some of these supply systems may operate seasonally, so their total annual demand may not be spread evenly throughout the year.

Table 1: 2002 Demands of Minor Public Water Suppliers and Large Non-Community Water Users

SourceID	2002 Annual Total, MG	Supplier Name
Not Applicable	14.40	Hopedale Country Club
Total:	14.40	

3.1.6. WATER SYSTEM LIMITATIONS AND PLANNED IMPROVEMENTS

What are the infrastructural or physical limitations facing Hopedale's public water supply system, and what system improvements are currently proposed?

Table 2: Water-System Limitations

HOPEDALE WATER DEPARTMENT

Component	Limitation
Supply:	None Reported
Storage:	None Reported
Distribution:	low pressure neat Moor Rd
Pressure Zones:	None Reported
Inter-municipal Connections:	None Reported
Water Quality:	None Reported
DEP Permit	None Reported
Other:	None Reported

Table 3: Water System Planned Improvements

HOPEDALE WATER DEPARTMENT

Proposed Improvement Description

New Well:	in process
New Tank:	None Reported
Water Main:	None Reported
Booster Station:	Moor Rd
Inter-municipal Connections:	None Reported
Treatment Plant:	None Reported
Other:	None Reported

3.2: Land Use Around Existing and Potential Water Supplies

Note the following analysis refers to five maps, which were produced and given to each community in large format for planning and presentation purposes. Duplicates of these maps are also included in this report as an appendix, in small format. For best image clarity, refer to the presentation size maps.

3.2.1. CURRENT LAND USE IN EXISTING WATER-SUPPLY PROTECTION AREAS (MAP 1)

What are the existing land uses within Hopedale's WSPA's (Zone II's for wells and Zone B's for surface sources), and how much land within these areas is still "developable"?

Surface and groundwater sources for drinking water may be affected by adjacent or nearby land use activities, which can threaten drinking water quality. The Department of Environmental Protection (DEP) uses hydrogeologic modeling to determine areas of potential impact to drinking water sources, to help communities and regulators protect such sources. For the purposes of analysis in this report, we focus on two such designated areas for existing public water supplies, Zone II's for groundwater sources and Zone B's for surface sources.

The Code of Massachusetts Regulations (CMR) defines a Zone II as land overlaying that area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at safe yield, with no recharge from precipitation)¹. A Zone B represents the land area within one-half mile of the upper boundary of the bank of the surface water source, or the edge of its watershed, whichever is less, but must automatically include all land area within a 400 ft lateral distance from the upper boundary of the surface water source². This report refers to both Zone II's and Zone B's as **Water-Supply Protection Areas (WSPA)**.

The goal of Map 1 is to identify land within existing WSPA's that is currently *undeveloped* and at risk of becoming developed, as well as to display the land uses of the areas already *developed* within these WSPA's. For the areas already developed, communities can regulate activities that might pose threats to drinking water through general town by-laws and Board of Health regulations. Through its Source Water Assessment Program (SWAP), DEP has been working with communities across Massachusetts to identify specific threats to drinking water associated with the developed land within their WSPA's and to implement protections against such threats. As described in the next section, communities can use zoning by-laws or other measures to protect the *undeveloped* areas within WSPA's from *future* activities that may pose a threat to drinking water. In Hopedale, existing WSPA's constitute 720 acres, or 21% of the town; 8% of the land within these WSPA's is "developable," based on existing town zoning. (See Map 1)

3.2.2. POTENTIAL LAND USE DEVELOPMENT IN EXISTING WATER-SUPPLY PROTECTION AREAS (MAP 2)

What are the likely future land uses of these "developable" areas, according to existing zoning laws?

¹ 310 CMR 22.02

² 310 CMR 22.00

The goal of Map 2 is to depict potential future land use in the currently undeveloped areas of WSPA's, based on existing zoning³, including development that might not be compatible with existing water supplies. Communities may protect against incompatible future uses or activities through zoning by-laws, ordinances, and health regulations. Communities may also be able to restrict land from becoming developed, directly, through such means as land purchases or conservation restrictions for the purpose of water supply protection. Where Hopedale currently has water supply overlay protection districts in place, which use zoning by-laws to restrict activities most threatening to water supply sources, such districts are shown on Map 2. Table 4 shows the breakdown of potential future land uses within the currently undeveloped portions of WSPA's in Hopedale (See Map 2):

Table 4: Potential Future Land Uses in Undeveloped Portions of Existing WSPA's

Land Use	Total Acres	Percent of all WSPAs within Town Boundary
Potential Industrial	36	5%
Potential Commercial	0	0%
Potential Mixed	0	0%
Potential Residential	21	3%
Potential Agricultural/Natural	0	0%
Currently Developed	484	67%
Protected or Otherwise Constrained Land*	178	25%
Other	1	<1%

* Certain categories of protected or constrained land may contain existing development.

3.2.3. POTENTIAL FUTURE WELL SITES (MAP 3)

What areas of Hopedale are currently far enough away from developed land or otherwise restricted areas to *potentially* meet "new source approval" siting requirements for new groundwater supplies? – NOTE: These areas are not evaluated in this report for their potential to yield water, nor have they been individually assessed for conformance with all New Source Approval siting considerations.

The goal of Map 3 is to identify land that might warrant protection, as potential future groundwater supplies⁴. The map depicts areas that might be suitable for future groundwater supplies based strictly on relevant land use criteria. Public water suppliers cannot place new well supplies in areas that are currently developed (built on), nor can they place new wells in wetlands, under most circumstances. In addition, under current policy and practice, public water suppliers cannot – except under rare circumstances – place new wells in state or federal parks, on privately-owned protected open space, or on land that is under the jurisdiction of a municipal conservation commission. Additionally, Tier 1A and 1B Chapter 21E sites, which represent known oil and hazardous material contamination sites, are determined for the purposes of this project to be unsuitable for water supply development⁵. These restricted land uses

³ Interpreted through the EOEa Buildout Analyses

⁴ It was beyond the scope of this project to investigate siting requirements for potential new surface water sources, and the environmental, economic, and regulatory complexities around new reservoir development make the possibility of such future sources very unlikely for most communities.

⁵ The GIS dataset of Oil and Hazardous Material Sites, also called Tier Classified Chapter 21E sites, contains only points; the location of these points is the approximate center of the site, the center of a building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. The Tier classification scoring is based on factors outlined in the Massachusetts Contingency Plan, including the site's complexity, the type of contamination, and the potential for human or environmental exposure to the contamination.

were cumulatively subtracted from a map of the whole town. (*See series of inset maps immediately below the large frame, on Map 3*) In addition, because current DEP policy requires that a water supplier own or control all land within 400 feet (Zone I) around new public water supply wells, all land less than 400 feet from permanently protected open space and currently developed land is also excluded for consideration as a new well site. Finally, land less than 100 feet from wetlands is excluded, to reflect conservation commission jurisdiction under the Wetlands Protection Act.

The area remaining after applying the above cumulative restrictions is displayed in gold on an enhanced photo image ("orthophoto") of the town. (*See Map 3*) These gold-colored areas represent land that is most likely to be available for water supply development, based solely on land use and land cover new source approval siting requirements. Contact DEP for a full description of the New Source Approval process. A paler 400-foot yellow buffer around these potential well areas shows the potential Zone I WSPA's, associated with the potential well areas. Sand and gravel aquifers are also displayed on this map, to help identify where the above potential well areas occur above aquifer material. However, the reader is advised that the USGS aquifer mapping was intended to show only glacially derived stratified-drift aquifers (sand-and-gravel aquifers). Furthermore, the mapping was done coarsely and therefore does not necessarily represent all sand-and-gravel aquifer areas that would be suitable for public water supply wells, nor are the boundaries of the aquifer areas exact. Lastly, bedrock aquifers, which may exist in Hopedale, are not shown. ***For these reasons, Map 3 is not intended to direct water suppliers to where to develop new supplies. Site-by-site hydrogeologic analysis by trained professionals and assessment for full conformance with DEP New Source Approval Siting requirements is always required before developing new wells.***

Based strictly on the land use criteria, 418 acres, or 12.3% of the land area in Hopedale could be suitable for future well sites.

3.2.4. POTENTIAL FUTURE WELL SITES AND AREAS OF ECOLOGICAL CONCERN (MAP 3 INSETS)

At a broad brush scale, where do potential future supply areas appear to coincide with sensitive environmental areas, which are likely to impact an area's suitability as a new well site?

Inset maps on Map 3 depict core terrestrial and aquatic habitat areas identified through the Natural Heritage and Endangered Species Program, as well as wetlands and riparian corridors. These areas of ecological concern may affect the suitability of a given area for water supply development, based both on the value of ecologically significant areas to the communities within Hopedale and on the value of such resources to regulators. For example, the development of a well adjacent to a stream supporting core aquatic habitat may deplete the stream of the necessary flows to sustain threatened species. Or, alternatively, the development of a well in an area of core terrestrial habitat could ensure the ongoing preservation of the area as viable habitat. ***Similar to the site-by-site analysis required to determine the hydrogeologic suitability of an area for water supply development, site-by-site analysis by trained professionals is necessary to determine the ecological suitability of an area for water supply development.***

In addition, some sites are automatically given a Tier I classification if they pose an imminent hazard or affect public water supplies. The Water Assets project will use sites classified as Tier IA or IB, which have a score equal to or greater than 450. These sites are buffered 400 feet to better represent the geographic footprint of the site, although contamination plumes may extend beyond this area and should be considered individually, where extent is known.

Based on the Map 3 analysis, areas for potential future well sites and areas of ecological concern coincide to a moderate degree. (See Map 3 insets)

Table 5: Potential Future Well Sites and Sensitive Environments

Potential Future Well Sites Coinciding with:	Total Acres	Percent of Total Area (# acres) Potentially Suitable for Future Well Sites*
Terrestrial Core Habitat	118	28.2%
Aquatic Core Habitat	1	0.2%
Wetlands and Riparian Corridors	28	6.7%

* Areas of ecological concern may overlap, so percents are not necessarily additive.

3.2.5. POTENTIAL FUTURE ZONE I WATER-SUPPLY PROTECTION AREAS (MAP 4)

What are the existing land uses within these potential well sites and their associated Zone I protection areas?

As mentioned above, the lighter yellow shading around the gold potential well sites on Map 3 represent the area around the potential well sites that would constitute the associated Zone I WSPA's for these wells.

Map 4 depicts the current land use within these potential Zone I WSPA's. Potential Zone I areas constitute 1,089 acres, or 32% of the land area in Hopedale.

3.2.6. FUTURE LAND USE IN POTENTIAL ZONE I WATER-SUPPLY PROTECTION AREAS (MAP 5)

What are the likely future land uses within these potential well sites and their associated Zone I protection areas, according to existing zoning laws?

Map 5 depicts potential future land uses in the potential Zone I WSPA's, based on zoning. As with undeveloped land within existing WSPA's (Zone II's and Zone B's), if a community determines that any of the potential well sites is suitable for water supply development, they may use zoning by-laws, ordinances, and health regulations to protect against future development and activities in these areas that are incompatible with a drinking water source. As some of these approaches may prove logistically or legally difficult prior to the development of the site as a drinking water source and prior to the delineation of an actual Zone II, communities may also be able to restrict land from becoming developed, directly, through land purchases or conservation restrictions, for the purpose of water supply protection.

Note that for planning purposes, communities may find it useful to look at existing and zoned land use within a wider area around the potential future well site, as such adjacent land may impact the drinking water source. For example, in the absence of a developed Zone II, communities could actively engage in land use planning within a ½ mile radius around the future wellhead – the equivalent of an “interim wellhead protection area” – for sites determined through further investigation to be suitable for water supply development.

Table 6 shows a breakdown of potential future land uses in potential future Zone I areas. *The development of potential water supply areas into many of the zoned land uses below would eliminate their potential as supply areas. In order to retain the viability of these sites for potential future water supply development, proactive planning may be required.*

Table 6: Potential Land Use in Potential Future Zone I WSPA's

Potential Land Use	Total Acres	Percent of all Potential Future Zone I's
Industrial	346	32%
Commercial	0	0%
Mixed	0	0%
Residential	81	7%
Agricultural/Natural Land	0	0%
Developed	91	8%
Protected or Otherwise Constrained Land*	571	52%
Other	1	<1%

* As most categories of permanently protected open space were used as restrictions in determining potential Zone I areas, these permanently protected lands appearing within the potential Zone I areas displayed on Map 5 are most likely municipal water department land or land owned by the Army Corps of Engineers.

3.3: Demand Management Strategies

In almost all cases, the most reliable and cost-effective means to increase the capacity of water supplies is to retain more water in the aquifers and reservoirs through reduced demand. In this sense, water saved through conservation and reduced demand can be thought of as a future supply.

In 1992, the Massachusetts Water Resources Commission (MWRC) published “Water Conservation Standards” designed for all Massachusetts communities with public water supply systems. These standards address: public education; leak detection and repair; metering and accounting for distributed water; water pricing; demand reduction strategies within the residential, municipal, and industrial/commercial/institutional sectors; and long-range demand management planning. Lawn and Landscape Conservation Standards were added in 2002, as an amendment to the Standards. For community supply systems subject to permitting under the Water Management Act (WMA), the Water Conservation Standards are incorporated into the WMA permit.

In 1999, the MWRC adopted Interbasin Transfer Act (ITA) Performance Standards, which communities must meet in order to be approved by the MWRC for an “interbasin transfer” – the intermunicipal transport of drinking water or wastewater across watershed boundaries, at volumes meeting thresholds for “significance.” The ITA Performance Standards for drinking water transfers address similar demand management strategies as the 1992 Water Conservation Standards, but include some additional measures and some more stringent targets.

While not all communities are subject to the Water Conservation Standards or ITA Performance Standards from a regulatory perspective, both sets of standards can be helpful guidelines to communities in setting demand management targets to maximize the efficiency of existing supplies.

Table 7 includes targets established either under the 1992 Conservation Standards or the 1999 ITA Performance Standards for Water Supplies. Not all targets within these sets of guidelines are included in the analysis below, but the table is designed to provide a few useful metrics for measuring existing demand management performance within Hopedale’s water supply systems and identifying areas where more concerted conservation and demand management strategies could lessen the strain on existing supplies. For a more complete set of conservation recommendations and guidelines, see Table 8 “Standards and Recommendations Selected from the Water Resources Commission’s 1992 Conservation Standards for the Commonwealth of Massachusetts” and the “Summary of Lawn and Landscape Standards and Recommendations,” both at the end of this section.

**Table 7: Water Conservation Status in 2002/2003
HOPEDALE WATER DEPARTMENT**

Criterion	Conservation Standard	Current (2002/2003) Public Water Supplier
Residential Water Usage	65 gpd/capita*	52 gpd/capita**
Unaccounted-for Water	10%*	9%
Municipal Metering of Public Buildings	100%*	100%
Leak Detection Survey frequency/last completed	Every 2 yrs*	2003
Water Audit frequency/last completed	Every 3-5 yrs*	2003
Municipal Bldgs fitted with Water Saving Devices	All*	100%
Water Conservation Education Plan	Yes*	Yes
Written Drought Plan	Yes*	Yes
Customer Metering	100%	100%

Standards designated with () represent Interbasin Transfer Act Performance Standards that are additions to, or more stringent than, the 1992 Conservation Standards. All others are identical in the two sets of standards.

**-GPCD based on PWS Data - Average (Weighted) Population Served

HOPEDALE WATER DEPARTMENT

As shown in the table above, the Hopedale Water Department reported 9% unaccounted-for water in 2002. This meets the goal for unaccounted-for water of 10%.

Residential use represents 77% of total demand. The existing per capita consumption of 52 gpcd meets the goal of 65 gpcd.

Commercial use represents 7% of demand, and industrial/agricultural use represents 0% of demand.

Older water meters tend to under-record, resulting in the user not paying for the full cost of the water. Therefore, a plan to replace customer meters, especially in commercial/industrial/agricultural sectors, every 10-15 years, making users more accountable for their water, may reduce demand in these sectors.

Water Resources Commission Standards and Recommendations for Water Conservation

Table 8 provides an overview of the Massachusetts Water Resources Commission's (MWRC) 1992 Water Conservation Standards followed by the Lawn and Landscape Conservation Standards that were added as an amendment in 2002. These standards and recommendations may be helpful to communities in determining how additional conservation and demand management measures may help further reduce pressures on existing supplies. For the complete guidance, please see the complete documents: *Water Conservation Standards for the Commonwealth of Massachusetts*, and *Guide to Lawn and Landscape Water Conservation*, available on the Water Resources Commission website, at <http://www.state.ma.us/envir/mwrc/default.htm>.

TABLE 8: STANDARDS AND RECOMMENDATIONS SELECTED FROM MWRC'S 1992 WATER CONSERVATION STANDARDS FOR THE COMMONWEALTH OF MASSACHUSETTS

Category	Standard	Recommendations
Public Education	<p>Development of an education plan with the following emphases:</p> <p>1) Explain all costs involved in providing water. 2) Show how conservation will provide long-term savings. 3) Highlight environmental benefits of reducing water demands.</p>	<p>Choose appropriate combination of programs to:</p> <ul style="list-style-type: none"> • target the largest users early • use schools and media to involve children • help customers track water use • advertise successes/(failures) • utilize conservation information centers • have informational speakers at community organizations • use public service announcements and local media to educate on supply sources and status • promote conservation devices and water-conserving landscape practices • use civic and professional organization resources and hold special events and educational contests
Leak Detection and Repair	<p>(1) A full leak detection survey of the distribution system should be completed every two years. (2) Leak detection and repair should be recognized as expenses of the water supply system and included in a full-cost pricing structure.</p>	<p>(1) Because leak detection requires substantial skill, regularly trained, in-house teams are recommended; communities should investigate the advantages of sharing leak detection equipment and personnel to reduce costs. (2) There should be consideration given to assuring the penalty for water theft.</p>
Metering	<p>(1) Each public water supplier should develop a program to implement 100% metering of all public sector and private users with meters. (2) The metering program should include regular meter maintenance. (3) The metering program should include regular meter reading of all public sector users and regular accounting of their use. (4) Meter reading and billing for domestic accounts should be done quarterly. (5) Master meters should be calibrated annually.</p>	<p>(1) Meter reading, billing, and meter maintenance for the largest users should be done more frequently than domestic accounts. (2) Exterior meter reading devices should be installed. (3) Meter reading and billing frequency would be most effective if done on a monthly basis. (4) Suppliers should consider replacing meters every 10 – 15 years.</p>
Pricing	<p>(1) Water pricing structure should include the full-cost of operating the water supply system. (2) Water supply system operations should be fully funded by water supply system revenues. (3) Each water supplier should regularly evaluate existing rate structures, including any peak demand and seasonal pricing components. In addition, the water supplier should consider all possible pricing options, such as increasing block rates. (4) Water and sewer rates, where applicable, should be billed so as to inform customers of their actual use and cost of each.</p>	<p>(1) Each water supplier should establish an enterprise account for water. (2) Water suppliers should consider adopting increased seasonal rates to moderated peak demands and/or to protect/maintain supply levels.</p>

STANDARDS AND RECOMMENDATIONS SELECTED FROM THE MWRC'S 1992 WATER CONSERVATION STANDARDS FOR THE COMMONWEALTH OF MASSACHUSETTS (Cont.)

Category	Standard	Recommendations
Residential Water Use	<p>(1) Water suppliers, in cooperation with manufacturers and professional organizations, should make available to residential users at least the following water saving devices: low-flow shower heads; faucet aerators, toilet displacement devices and/or low-flow toilets, toilet leak detection kits; and educational literature about installation and water conservation savings (in gallons and dollars), including outdoor watering and xeriscaping.</p> <p>(2) The state plumbing code should be strictly and consistently enforced at the local level.</p>	<p>(1) In order to ensure proper installation and greater payoff of retrofit devices, professional installation is recommended.</p> <p>(2) Statewide efficiency standards should be legislatively set for appliances.</p> <p>(3) The decision to use gray water, small irrigation wells, and rain water from roof catchment systems should be consistent with existing state laws and should be made at the local and regional levels. Xeriscaping or use of native vegetation should be encouraged.</p> <p>(4) Water audits should be made available to residential customers.</p>
Public Sector Water Use	<p>(1) Government facilities, including school departments and hospitals should account their full use of water, based on full metering of public buildings, parks and other facilities.</p> <p>(2) Public buildings should be built or retrofitted with equipment that reduces water use.</p> <p>(3) Water use by contractors using fire hydrants for pipe flushing and construction should be metered and they should be charged, including service fees.</p> <p>(4) Irrigation of municipal property should be sensitive to soil moisture.</p> <p>(5) Strictly apply plumbing codes and incorporate other conservation measures in new and renovated buildings.</p>	<p>(1) Encourage manufacturers to provide water saving devices to municipalities for demonstration projects for free or at reduced cost; master water temperature regulation should be considered for public buildings</p> <p>(2) Encourage xeriscaping or use of native vegetation to reduce outdoor watering; emphasize the advantages of drip irrigation over broadcast watering, and promote these measures in educational campaigns.</p> <p>(3) Investigate the potential uses of non-potable water supplies and small irrigation wells for landscaping, street cleaning and building washing, within public health considerations, existing connection programs, and plumbing board decisions.</p>
Industrial, Commercial, and Institutional Water Use	<p>(1) All industrial, commercial, and institutional water users should develop and implement a written water policy.</p> <p>(2) All industrial and commercial water users should carry out a water audit.</p> <p>(3) In new and renovated buildings, comply with plumbing codes and use the best available technologies for water conservation.</p>	<p>(1) All industrial, commercial, and institutional users should install/retrofit water saving sanitary devices.</p> <p>(2) Industrial and commercial users should work with code officials, standards committees, state programs, manufacturers, and legislators to promote water conservation.</p> <p>(3) Develop a system to reward employees for water savings suggestions.</p>
Water Supply System Management	<p>(1) Municipalities should develop regulations, by-laws or ordinances that can be imposed in the event of water supply emergency.</p> <p>(2) Water suppliers should develop strategies to reduce daily and seasonal peak demands and should develop contingency plans for seasonal shortages.</p> <p>(3) Water suppliers should carry out water supply system audits every 3 to 5 years.</p> <p>(4) Water suppliers should develop a plan to identify all uses of water and identify how to recover unaccounted-for water.</p> <p>(5) Water suppliers should investigate and develop plans for interconnections with other systems for emergency supplies.</p>	<p>(1) Communities should develop a local water resources management plan.</p> <p>(2) Water suppliers should keep local officials regularly informed of water consumption and supply availability.</p> <p>(3) Communities should adopt municipal by-laws requiring commercial, industrial and institutional water users to carry out regular water audits.</p>

SUMMARY OF THE LAWN AND LANDSCAPE WATER CONSERVATION ADDENDUM - added to the Water Conservation Standards for the Commonwealth of Massachusetts by MWRC as of October 10, 2002

Standards

1. Communities and public and private water suppliers should develop drought management plans that identify water supply and environmental indicators to serve as drought stage triggers and that outline a set of increasingly stringent water use restrictions that are designed to protect public health and the environment and that can be implemented through bylaw, ordinance or regulation.
2. Communities and public and private water suppliers should implement a water use restriction bylaw, ordinance or regulation that provides the community or water supplier with the ability to implement mandatory water use restrictions. These restrictions should be tied to environmental and water supply indicators as outlined in a drought management plan.

[NOTE: As used here "drought management plans" are not restricted to periods of officially designated drought - water shortages and environmental impacts from water withdrawals are not only the result of droughts but may occur on a regular basis during dry months. The term drought is used to reflect situations where the water shortage or environmental impact is the result of dry conditions or other natural stresses. Water shortages refer to system capacity issues, which may be the result of dry conditions or other factors such as system problems or large uses such as fighting a large fire. In either case, drought plans need to establish the levels of dry, drought, or low water supply conditions that are likely to lead to a water supply shortage or emergency. Communities that have insufficient water supplies may implement parts of their plan during non-drought years to help reduce peak demands that threaten the water supply system or the environment.]

Recommendations

The Guide to Lawn and Landscape Water Conservation, approved by the Water Resources Commission in 2002, contains detailed recommendations and suggestions for a wide range of potential users. Those most relevant to the analysis in this report are briefly summarized here. Please refer to the Guide for more detailed discussion of each recommendation.

Recommendations for municipalities and other public water suppliers

- Raise public awareness
- Develop a bylaw requiring water conservation equipment for automatic irrigation systems
- Develop a bylaw minimizing high water use landscape areas
- Implement conservation rate structures
- Adopt and implement a leak detection and repair program
- Promote alternatives to traditional lawn watering and to automatic irrigation systems.
- Promote automatic irrigation system audits
- Develop bylaws related to the use of automatic irrigation systems.
- Develop bylaws related to land clearing and lawn size

Recommendations for Property Owners and Managers

- Minimize lawn size.
- Choose drought tolerant native plant species
- Water only when necessary
- Abide by water restrictions and other conservation measures implemented by your municipality or water supplier
- Ensure adequate depth and type of soil
- Do not water lawns and do not install automatic lawn irrigation systems in water short communities
- Install water conservation equipment and properly maintain automatic irrigation systems
- Collect and reuse water for landscaping needs
- Mow lawns at the highest recommended height

Recommendations for property owners and managers responsible for recreational fields

- Design facilities to minimize water use
- Maintain facilities to minimize water use
- Use automatic irrigation systems to reduce water use
- Use reused water where possible
- Reduce water use during dry and drought conditions
- Raise public awareness.

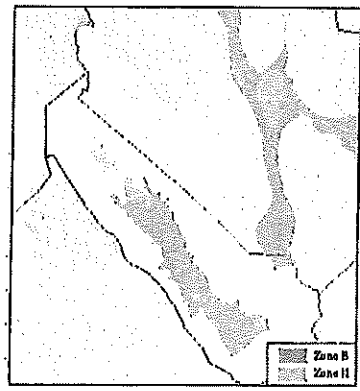
Appendix A

Maps



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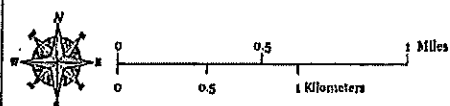
Map 1
Current Land Uses
 in
Existing Public Water Supply
Protection Areas
Hopedale



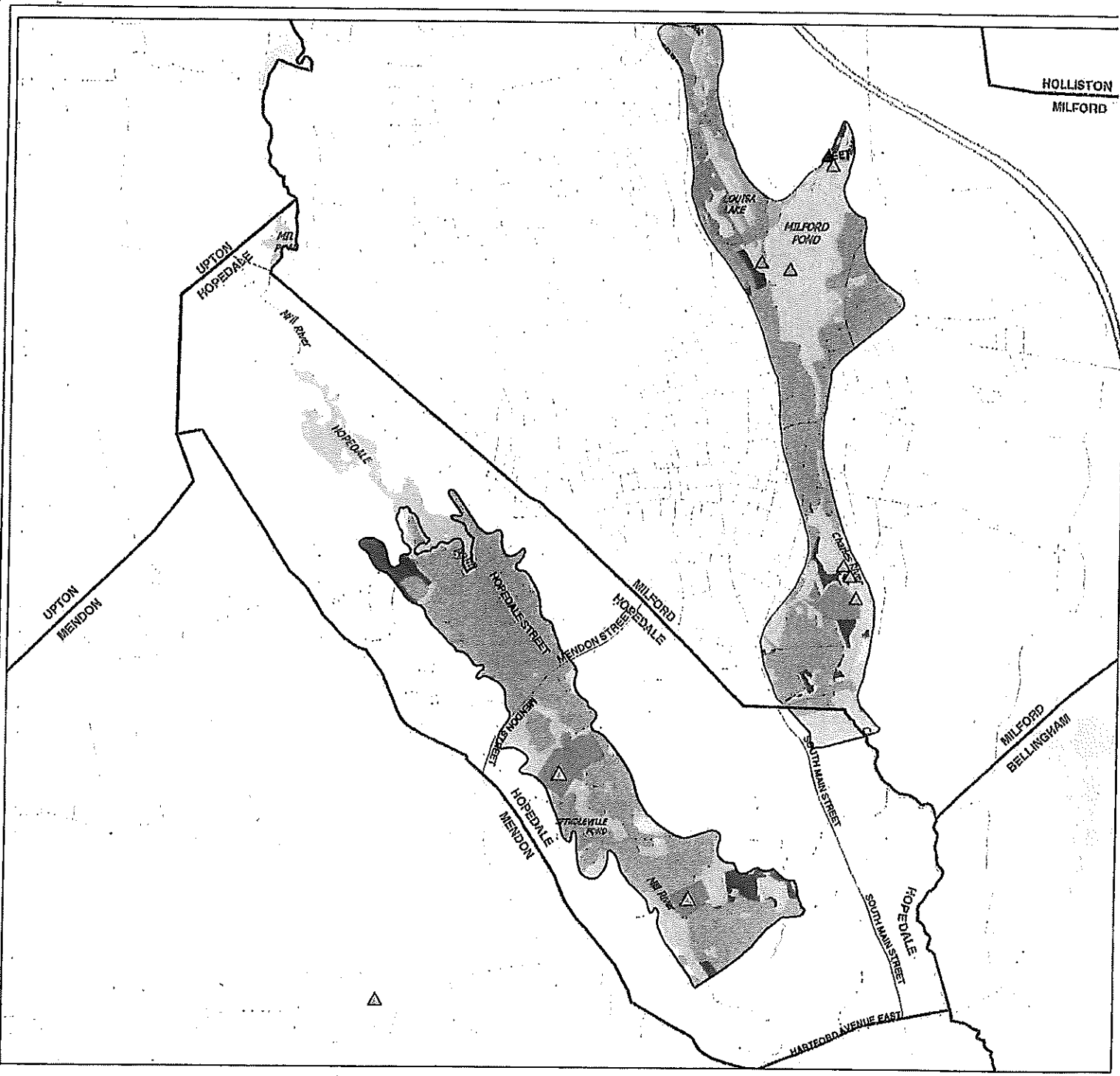
- Water Supply Protection Area (Zone II or Zone B)
- Developable Land
- Undevelopable Land
- Criteria that may constrain land from development include slope, wetlands, River Protection Act buffers, 100-year flood zones, certain zoning overlays and rights-of-way, and restrictions outlined in an existing development plan.
- Protected Open Space within or contiguous with Zone IIs or Zone Bs
- Municipal Boundary
- Public Water Supplies**
- Hopdale Supply
- Other Source
- Ground Water
- Surface Water
- Proposed Well

- Current Land Use in developed areas**
- Multi-Family and High Density Residential
- Medium Density Residential
- Low Density Residential
- Commercial
- Industrial/Transportation/Mining
- Urban open/Recreational
- Subdivisions (from EOEa Buildout Analysis)

- Water Features**
- River or Stream
- Intermittent Stream
- Lake or Pond



This project is funded by the Executive Office of Environmental Affairs (EOEA).
 Maps prepared by PathTrack, Central Massachusetts.



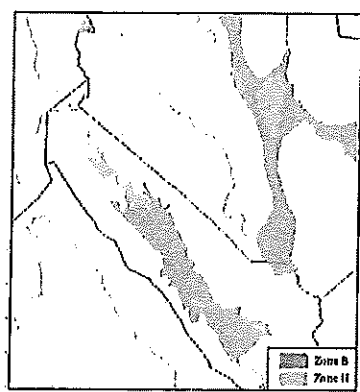
HOLLISTON
MILFORD

UPTON
HOPEDALE

UPTON
MENDON

MILFORD
BELLINGHAM

SOUTH MAIN STREET
HOPEDALE
HARTFORD AVENUE EAST



Water Supply Protection Area (Zone II or Zone B)

Developed Land

Undevelopable Land
Criteria that may constrain land from development include slope, wetlands, River Protection Act buffers, 100-year flood zones, certain zoning overlays and rights-of-way, and restrictions outlined in an existing development plan.

Protected Open Space (within or contiguous with Zone IIs or Zone IIs)

Municipal Boundary

Public Water Supplies

Ground Water
 Surface Water
 Proposed Well

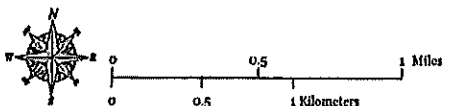
Potential Future Land Use in undeveloped areas, derived from zoning by-laws

- Agriculture
- Very Low Density Residential
- Low Density Residential
- Medium Density Residential
- Higher Density Residential
- Mixed Use
- Commercial
- Industrial/Transportation/Mining
- Urban open/Institutional/Recreation
- Natural Land/Undisturbed Vegetation
- No Zoning or Unknown

Water Features
 River or Stream
 Intermittent Stream
 Lake or Pond

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Map 2
Potential Land Uses
in
Existing Public Water Supply
Protection Areas
Hopedale



Map 3

Land Potentially Available for Future Groundwater Supplies

Hopedale

Potential groundwater supply location

Note: This analysis is based strictly on land use and land cover. These areas are not evaluated in this report for their potential to yield water.

Potential public water supply protection area (Zone I)

Aquifers

High Yield

Medium Yield

Public Water Supplies

Hopedale Supplies		Other Supplies
Ground Water		Ground Water
Surface Water		Surface Water
Proposed Well		Proposed Well

The following restrictions were used to identify potential areas for future public water supply:

1. No residential, commercial, industrial, transportation or waste disposal land use, or Tier 1A or true Tier 1B 21E sites; and no land within 400 feet of any of the above.
2. No wetlands or land within 100 feet of a wetland.
3. No land under the control of a municipal conservation commission, no permanently protected state- or privately-owned open space, no federally-owned open space other than land owned by the Army Corps of Engineers, and no land within 400 feet of any of the above.

These restrictions are based on the best available data at the time of project completion.

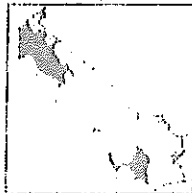


Date of aerial orthophoto: April 2001

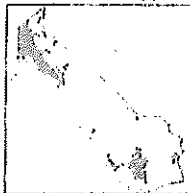
Hopedale



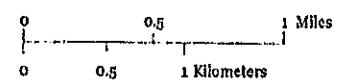
Restriction 1 applied:



Restrictions 1 and 2 applied:

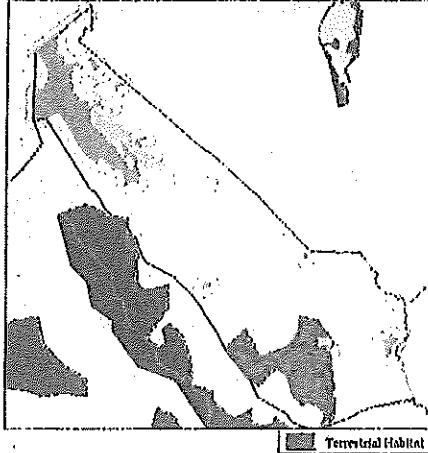


Restrictions 1 through 3 applied:

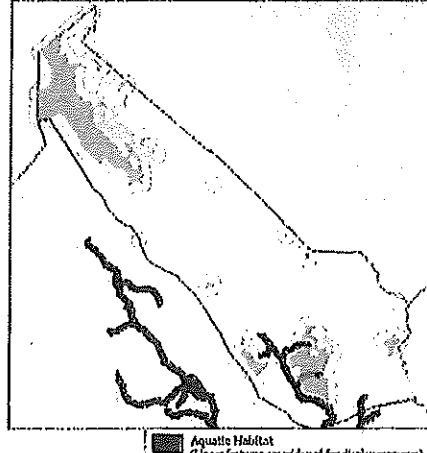


Natural Heritage and Endangered Species Program

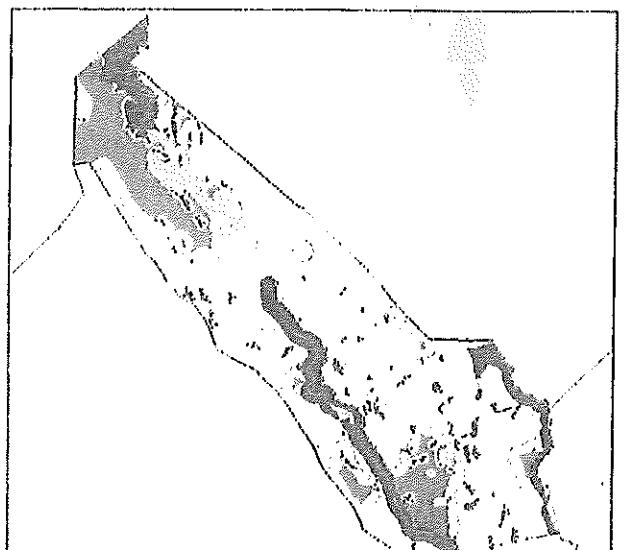
Terrestrial Core Habitat
Source: BioMap Project

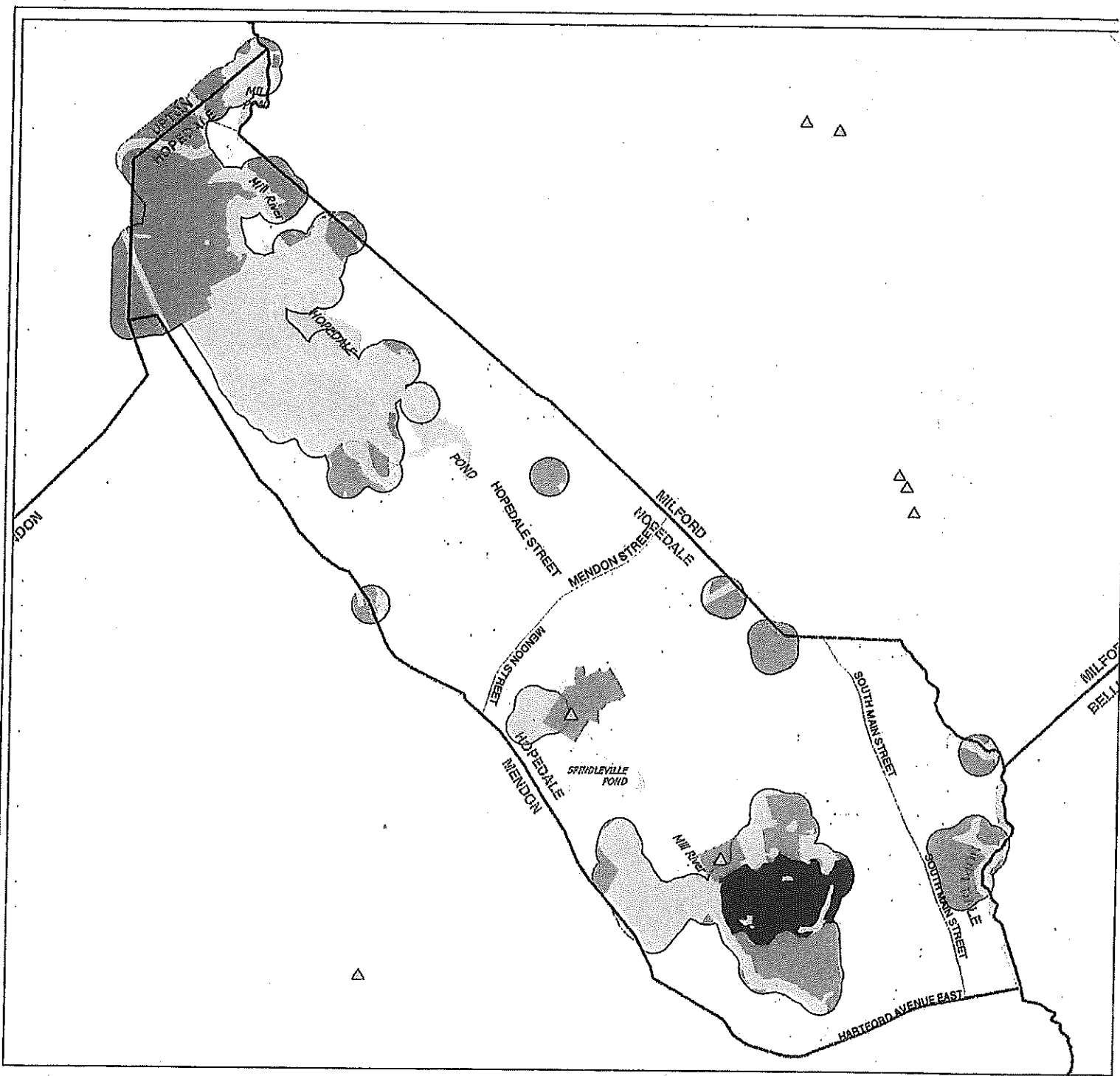


Aquatic Core Habitat
Source: Living Waters Project

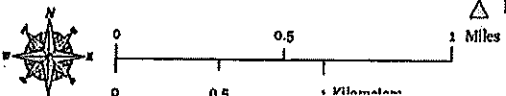
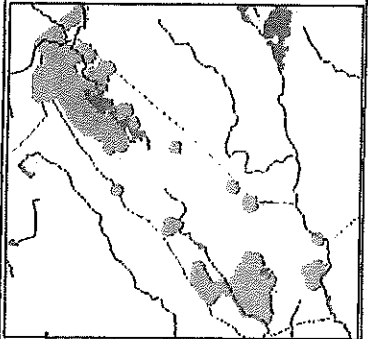


Wetlands and Riparian Corridors





Potential Future Zone I Public Water Supply Protection Areas see Map 3



- Potential Future Water Supply Protection Area (Zone I)
- Undevelopable Land
Criteria that may constrain land from development include slope, wetlands, River Protection Act buffers, 100-year flood zones, certain zoning overlays and rights-of-way, and restrictions outlined in an existing development plan.
- Protected Open Space
within or contiguous with potential future Zone I other than federally-owned, permanently protected state- or privately-owned, or under the control of a municipal conservation commission (see Map 3).
- Municipal Boundary
- Public Water Supplies**
 - Hopdale Supplies
 - Other Ponds
 - Ground Water
 - Surface Water
 - Proposed Well

- Current Land Use**
- Agriculture
 - Natural Land/Undisturbed Vegetation
 - Urban open/Institutional/Recreation
 - Mining
 - Open Undeveloped Land

- Water features**
- River or Stream
 - Intermittent Stream
 - Lake or Pond

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Map 4
Current Land Use
in
Potential Public Water Supply Protection Areas
Hopedale



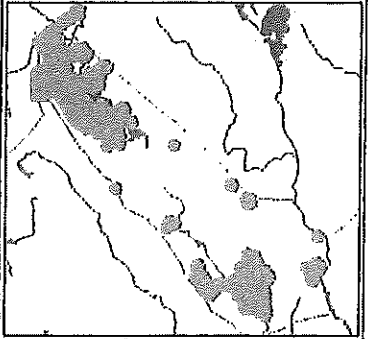
This project is funded by the Executive Office of Environmental Affairs (EOEA).
Maps prepared by Earth Tech, Concord, Massachusetts



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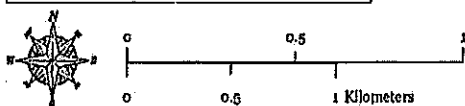
Map 5
**Potential Land Use
 in
 Potential Public Water Supply
 Protection Areas**
Hopedale

**Potential Future Zone I Public Water
 Supply Protection Areas** see Map 3



- Potential Future Water Supply Protection Area (Zone I)
- Undevelopable Land
 Criteria that may constrain land from development include slopes, wetlands, River Protection Act buffers, 100-year flood zones, certain zoning overlays and rights-of-way, and restrictions outlined in an existing development plan.
- Protected Open Space within or contiguous with potential future Zone I other than federally-owned, permanently protected state- or privately-owned, or under the control of a municipal conservation commission (see Map 3).
- Municipal Boundary
- Public Water Supplies**
- Hopedale Applies Ground Water
- Other Towns Ground Water
- Surface Water
- Proposed Well

- Potential Future Land Use in potential Zone I areas, derived from zoning by-laws**
- Agriculture
- Very Low Density Residential
- Low Density Residential
- Medium Density Residential
- Higher Density Residential
- Mixed Use
- Commercial
- Industrial/Transportation/ Mining
- Urban Open/Institutional/ Recreation
- Natural Land/ Undisturbed Vegetation
- No Zoning or Unknown
- Water features**
- River or Stream
- Intermittent Stream
- Lake or Pond



This project is funded by the Executive Office of Environmental Affairs (EOEA).
 Maps prepared by Earth Tech, Concord Massachusetts.

Appendix B

Federal and State Funding Programs for Water Supply Improvements

Two Federal and State Funding Programs

The following summarizes two state and federal funding programs available to water suppliers for water system improvements.

Federal Funding Programs

- Program:** Rural Water and Waste Disposal Grants and Loans
- Sponsor:** U.S. Department of Agriculture (USDA), Rural Development (RD)
- Type:** Guaranteed (pay back up to 40 years) loans and grants on a federal fiscal year (FY) basis (October 1 –September 30). As of the current federal quarter (FY04 – 2nd Quarter), loan rates can range from 4.5 – 4.625% and grants can be for up to 75% (35-40% usual maximum) of eligible project costs (no planning).
- Competition:** Loans – moderate; extremely high for grant funds.
- Eligible Projects:** Those in communities (and/or special purpose districts) with a population under 10,000 and with a median household income under \$43,000 based on 1990 U.S. Census Data that provide new or upgraded water and waste disposal facilities/services for rural residents and businesses, especially those that alleviate public health issues.
- Eligible Costs:** Design and construction phase project costs.
- Ease of Application Filing:** User-friendly agency with relatively simple application requirements. Submittals do require technical and financial expertise. Not a regulatory agency.
- Program Contacts:**
- Diane King, Rural Development Specialist
USDA/RD Area Office
Holden, MA
508-829-4477 ext. 4
- Ronald Koontz, Rural Development Specialist
USDA/RD Area Office
West Wareham, MA
508-295-5151 ext. 3
- Calendar:**
- Year 1 – File application in late winter to early summer prior to congressional appropriation of funds for the next fiscal year.
- Federal appropriation by October 1.
- Year 2 – Approval of project as soon as federal appropriation available after October 1, and RD/RUS issues commitment letter.

Summary of Available State Funding Program

- Program:** Massachusetts Drinking Water State Revolving (Loan) Fund (DWSRF)
- Sponsor:** Massachusetts Department of Environmental Protection (DEP)/Massachusetts Water Pollution Abatement Trust (MWPAT)
- Type:** Low Interest Loan Program distributed on a calendar year (CY) basis (January 1 – December 31). CY 2004 program legislation provides for a subsidized 2% loan (fixed).
- Competition:** High. In DWSRF Program, funds are only available for construction phase project costs (no planning or design).
- Eligible Projects:** Construction Phase project costs (planning and design currently not eligible).
- Ease of Application Filing:** Multiple/Difficult – requires both a preliminary (Project Evaluation Form) and final application (SRF Application) and both technical and administrative/financial expertise.
- Note:** Program administration handled by DEP Boston office (Division of Municipal Services). Regional offices responsible for permitting and technical approvals. Boston office recently reorganized staff and functions.
- Program Contacts:** Boston – Department of Environmental Protection
Division of Municipal Services
One Winter Street, 5th Floor
Boston, MA 02108
- Steven J. McCurdy, Acting Director
617-292-5779
- Thomas Mahin, Acting Deputy Director
617-654-6521
- Donald St. Marie, Northeast/Metro Boston and Western
Region Program Manager
617-292-5709
- Jack Hamm, Central/Southeast Region Program Manager
617-292-5883

www.magnet.state.ma.us/dep

Regions –

Northeast – One Winter Street, Boston, MA 02108
Kevin Brander, 617-654-6519

Southeast – 20 Riverside Drive, Lakeville
Dick Keith, 508-946-2784

Central – 627 Main Street, Worcester
Paul Anderson, 508-767-2802

Calendar (same cycle each year):

Year 1 – State/Federal Appropriations – by October 1

Year 2 – DEP Request for Projects – June 1 ±
- Submission of Project Evaluation Forms – August 15
DEP Priority List finalized – by December 31

Year 3 – Local Funding Authorization – by June 30
- File full application – by October 15
- DEP approval of project and issuance of Project Approval
Certificate – by December 31
- Project must start within 6 months of PAC issuance

Appendix C

Methodology

Methodology

To complete the analysis for the Water Assets Study, Earth Tech collected and evaluated statistical data on public water supplies, general information on water systems, and geographic data.

Water Supply Statistics

Earth Tech collected statistical data on individual water supply sources, including pumping capacities, approved yields, and annual, average-day, and peak yields. One goal of this study was to resolve well yield inconsistencies in the Department of Environmental Protection (DEP) databases, primarily the Water Quality Testing System (WQTS) and Water Management Act (WMA) databases. Both DEP and the Executive Office of Environmental Affairs (EOEA) were concerned that well yields might be counted twice or under-counted in the DEP databases, especially where multiple wells are manifolded together or grouped before being pumped into the water-distribution system.

Resolving these database concerns fits into the larger goal of obtaining an accurate count of the total physical pumping capacity and regulatory capacity in each community. For the purposes of this study, the "physical pumping capacity" represents the amount of water a supplier believes a well or surface water source can supply based on physical constraints, such as pump size, soils, operational limitations, and size of watershed. This was initially determined by assigning each groundwater source a daily capacity of that source's highest single daily yield between 1998 and 2002, or that source's approved Zone II limit, whichever was greater. Any surface source was assigned its associated treatment plant capacity. All capacities by source or group of sources were summed by system, and if they converged on treatment plants, they were limited by treatment capacity where appropriate. Finally, suppliers were asked to refine the number if necessary to reflect well deterioration, interference between sources, or other operational limitations.

"Regulatory capacity" represents the authorized withdrawal volume as regulated through DEP's New Source Approval program and the WMA. DEP authorizes maximum daily withdrawals for individual sources, termed "DEP Approved Daily Volumes". The DEP Approved Daily Volume, in many instances, may be equal or nearly equal to the "physical pumping capacity" of the source. DEP also regulates a water supplier's total system-wide withdrawals under the WMA. In contrast to the DEP Approved Daily Volumes, which are driven by the goal of water-supply protection, the WMA approved withdrawals are aimed at equitable and wise use of water. Accordingly, the WMA program considers ecological impacts and effects of withdrawals on other water users in determining the WMA approved withdrawals. The WMA regulatory capacity that applies to any water system is normally less than the sum of the physical capacities of the individual sources. Further, the WMA program may place "special conditions" in permits that restrict withdrawals from individual sources or groups of sources seasonally, or based on environmental triggers, to reduce impacts to nearby streams, wetlands, or other sensitive ecological areas.

Earth Tech collected and verified data on system-wide consumption, such as annual and maximum day volumes, annual purchase/sales, as well as total pumping capacity. We also gathered statistics on water consumption broken out by customer type (residential, commercial, etc.), which was helpful in estimating average per capita consumption. Additionally, we tabulated data related to conservation efforts in each community to identify the regional extent of these efforts, and to help communities identify where such efforts could potentially help sustain their existing supplies.

The original source of much of the statistical data was the Public Water Supply Annual Statistical Report, which each water supplier submits to DEP each year. Earth Tech also obtained data from DEP's Zone II and WMA databases. Data relevant to this project were obtained from electronic databases, in the cases

for which DEP enters responses into an electronic database, and manually from paper files or microfilm in other cases.

Water System General Information

Earth Tech made a considerable effort to obtain non-statistical information on each of the major municipal water systems directly from the water suppliers. These included perceived limitations in the water-system infrastructure, planned water-system improvements, locations and estimated yields of potential new supplies, information on conservation efforts, billing and water rates. WMA restrictions on individual water-supply sources were obtained from the individual WMA Permits.

Geographic Data

The overall purpose of the mapping effort was to show existing and potential future land uses in existing Water Supply Protection Areas (WSPA) and to identify areas that potentially meet new source approval siting requirements for water supply development. The potential future land use was based on the municipal zoning layers gathered during the EOEA buildout analyses. Using GIS, potential future areas for supply wells were identified by cutting away areas that would likely *not* be available for new well development under current policy, such as land within 400 feet of developed areas and federally or state owned open space or land within 100 feet of wetlands.

The map analysis utilized the following datasets available from MassGIS: public water supplies, WSPA's, and wetlands developed by DEP, land use developed by the University of Massachusetts, openspace developed by MassGIS, and zoning data collected for the EOEA Buildout analyses and compiled by MassGIS.

A series of five maps was prepared for each community:

- Map 1 Current Land Uses in Existing Public Water-Supply Protection Areas
- Map 2 Potential Land Uses in Existing Public Water-Supply Protection Areas
- Map 3 Land Potentially Available for Future Groundwater Supply
- Map 4 Current Land Use in Potential Public Water-Supply Protection Areas
- Map 5 Potential Land Use in Potential Public Water-Supply Protection Areas

The first two maps display Zone II groundwater protection areas and Zone B surface water protection areas. Map 1 shows existing developed land uses within the WSPA's. For the purposes of this study, developed land uses include residential (high, medium and low density), commercial, industrial, transportation, mining, urban open and recreation using the land use 21 category classification (codes 5, 7-13 and 15-19). The analysis used the most recent land use layer available for the state, which was interpreted from 1999 aerial photography as part of the University of Massachusetts Department of Forestry Resource Mapping project. The remaining land areas within the WSPA's were displayed on Map 1 as developable land, protected open space, and land otherwise constrained from development, as defined in the EOEA buildout analysis. Criteria that might constrain land from development varied for each municipality and included such factors as slope, River Protection Act buffers, certain zoning overlays, rights-of-way including transmission lines, and restrictions from an existing development plan and the 100-year flood zone (no build areas). Wetlands were also displayed as constrained from development. Map 2 displays potential future land uses within the areas that appear in Map 1 as developable land. These potential land uses were derived from zoning by-laws, interpreted through the EOEA buildout analysis. Map 2 is the "negative" or reverse of Map 1 with regard to developed/undeveloped areas. The purpose of Map 1 is to show existing land uses in WSPA's, while Map 2 displays what the land use could look like in the future in WSPA's.

By subtracting from the town area a series of restricted land uses and land covers, potential areas for future public groundwater supply were identified for each community and shown on Map 3. The first restriction removed developed land uses, solid waste facilities, and Tier 1A and true Tier 1B 21E sites, with a 400-foot buffer. Neither mining, nor agriculture, nor urban open/recreation was considered a developed land use for the purposes of this analysis. In the second restriction, wetlands were removed with a 100-foot buffer, using the DEP conservancy wetlands for the majority of towns. In some areas the DEP conservancy wetlands layers were not yet completed; for these locations the hydrography layer developed from the USGS 1:24,000 quadrangles was used. In the third restriction, federally-owned or permanently protected state- or privately-owned open space was removed, as well as land under the control of the municipal conservation commission. To reflect current DEP policy that requires a water supplier to own or control all land within 400 feet (Zone I) around new public water supply wells, a 400-foot buffer around these open space lands was also removed. These restricted uses and land covers were subtracted cumulatively over the total area of the municipality. The remaining areas were displayed as potential new public water supply wells. It should be noted that the restrictions are based on existing land uses only, without regard to the locations of aquifers or certain sensitive environmental areas. Therefore, Map 3 shows areas that would be suitable for future well sites only from a land-use standpoint and are not meant to imply suitability on the basis of hydrogeologic and environmental criteria, nor conformance with all possible New Source Approval siting considerations. Suitability from the perspective of these criteria would need to be evaluated through detailed on-the-ground testing and assessment.

The largest data frame in the Map 3 layout shows the potential future water supply areas – both potential well locations, as described above, and a 400 foot buffer around these areas to represent all the potential Zone I area that might be associated with these potential well sites – overlaid on a MassGIS 2001 aerial photo. Aquifers are also shown. The purpose of this frame is to show where the potential future water supply areas may coincide with known sand-and-gravel aquifers, as mapped by the U.S. Geological Survey (USGS). Additional insets show where the potential future water supply areas may coincide with environmentally sensitive areas, including wetlands, riparian corridors, and terrestrial and aquatic core habitat developed by the Natural Heritage and Endangered Species Program as part of the BioMap Project and Living Waters Project.

Maps 4 and 5 display current land use and potential future land use within the “Potential Public Water-Supply Protection Areas” defined in Map 3 – that is, within the potential well sites and the Zone 1 areas that would be associated with them. These two land use depictions for *potential future Zone I* areas are analogous to the two land use depictions for *existing Zone II and Zone B* areas displayed in Maps 1 and 2.

A sixth map, the “Working Map” was provided to each community supplier during the data collection phase of this project. Each supplier was asked to mark up the “Working Map” to show the locations of potential future sources of supply, the major water-system components and the service area.

Water Supplier Involvement

Both Earth Tech and EOEA recognized that accuracy of data and the reports’ usefulness to communities were key to the success of this project. Accordingly, Earth Tech sought to maximize opportunities for direct face-to-face contact with water suppliers to verify data, resolve data discrepancies and to fully understand the details and unique aspects of each water system. Water suppliers were requested to:

- Verify the accuracy of previously reported yield data, by source
- Clarify whether multiple sources are manifolded together before entering the water system
- Verify the accuracy of previously reported system-wide consumption data, purchases and sales
- Verify previously reported consumption data by customer class (residential, commercial, etc.)
- Provide information on conservation efforts, water rates and billing

- Map the major water-system components and service area
- Identify the major water-system limitations and proposed water-system improvement projects
- Provide information on future sources of water

Appendix D

Overview of Existing Water System(s)

Overview of Existing Water System

Hopedale Water Department

Major System Components

Water Supply Wells: Hopedale Water Department has 2 Well Sources, They are Mill St. Well Field and Green St. Well (01G and 02G). Well 02G is combined with 03G and 04G, as shown on the WMA Registration Statement. Hopedale reports the combined pumpage from 02G, 03G and 04 G on its Annual PWS Statistical Form

Storage Tanks: Hopedale has only one water storage tank at Steel Rd. providing 0.84 MG of storage.

Miles of Pipe: 28

Treatment Facilities: None Reported

Inter-municipal Connections: There are four 8" inter-municipal connection in Hopedale. Two connect to Milford at Williams St. and South Main St., and the other two connect to Town of Mendon at East side of South Main St. and South side of Mendon St.

Pressure Zones: one

Water System Demands

5-year Consumption Statistics

	1998	1999	2000	2001	2002
Annual Volume (Net), MG	176.53	165.07	166.66	169.86	150.01
Maximum Daily Volume, MGD	0.72	0.45	0.46	0.59	0.00
Average Daily Volume (Net), MGD (365 days)	0.48	0.45	0.46	0.47	0.41
Average Daily in Maximum Month (Net), MGD	0.58	0.51	0.57	0.49	0.48
Total Pumping Capacity (all sources), GPM	425.00	425.00	425.00	425.00	425.00
Total Purchases, MG	24.15	45.33	28.98	24.57	25.68
Total Sales, MG	0.16				0.04

Water Purchase from Sales to other suppliers in 2002:

PWS ID	Buyer/Supplier	Purchase/Sale	Annual Volume MG
2185000	MILFORD WATER COMPANY	Purchase	25.68

Regulatory Constraints

Basin	Registration Number	Reg. Daily Vol. MGD	Permit Number	Perm. Daily Vol. MGD
Blackstone	21213802	0.41	NA	NA

Water Rate Structure and Billing:

- Pricing (Flat/Increasing/Decreasing/Seasonal): Increasing
- Billing Frequency: Residential 4 x YR Large Water Users 4 x YR
- Bills Based on Meter Readings (Yes/No) Yes
- Residential Base Rate (\$/unit): \$1.82/100 CF for 0-2,000 CF, \$2.40/100 CF for 2,001-6,000 CF, and \$3.64/100 CF for above 6,001 CF.
- Large Water Users Base Rate (\$/unit): Same

Water Conservation Programs:	
1. Customer Metering (%)	100
2. Meter Repair/Replacement Program (yes, no)	Yes
3. Most Recent Leak Detection and Repair Program (year)	2003
4. Most Recent Water Audit (year)	2003
5. Enterprise System (yes, no)	Yes
6. Public Buildings (municipal/state)	
a. Retrofitted with Water Savings Devices (yes, no)	100
b. Metered (yes, no)	100
7. Water-saving Devices available to customers (yes, no)	Yes
8. Water Conservation Bylaw (yes, no)	Yes
a. Outdoor Water Use Restriction (yes, no)	Yes
Briefly describe terms:	
Bylaw for water restriction	
9. Drought/Emergency Plan (yes, no)	Yes
10. Other Regulations Promoting Aquifer Recharge (yes, no)	Yes
a. Wellhead Protection bylaws (yes, no)	Yes
b. Subdivision Regulations/Alternative Zoning (yes, no)	Yes
c. Site Plan Review (yes, no)	Yes
d. Conservation Commission (yes, no)	Yes
e. Other (specify)	Board of Health regulatio
11. Water Bank (yes, no)	No
12. Education Programs (yes, no)	Yes
a. Target Largest Customers (yes, no)	No Data
b. Bill Stuffers (yes, no)	Yes
c. School Programs (yes, no)	Yes
d. Press Releases (yes, no)	Yes
13. Other (specify):	

2002 Consumption by Customer	Number of Connections	2002 Annual Volume (MG)	Percent of 2002 Demand
Residential	1855	116.18	77
Commercial	91	10.54	7
Industrial/Agricultural	0	0.00	0
Institutional	0	0.00	0
Other	22	9.89	7
Unaccounted-for Water	0	13.40	9
Total	1968	150.01	100

Residential Population Served and Corresponding Average Residential Consumption, GPCD (Town Data)

Summer Population: 6,081 Winter Population: 6,081
Average (Weighted) Population = $0.2 * \text{Summer Population} + 0.8 * \text{Winter Population}$ = 6,081
Summer GPCD: 52.3 Winter GPCD: 52.3 Average GPCD: 52.3

Residential Population Served and Corresponding Average Residential Consumption, GPCD (U.S. Census Data)

Population Per Household (U.S. Census Data for Town): 2.58
Population = U.S. Census Bureau Population per Household * # of Residential Connections = 4,786
(Assumes 1 Residential Connection = 1 Household)
GPCD (U.S. Census Bureau): 66.5

GPCD used in this report: 52.3

Based on: PWS Data - Average (Weighted) Population Served

Water Supplies

Well Supplies:

Source Name: TWF Mill Street
DEP Source ID: 2138000-01G
Basin: BLACKSTONE
DEP Zone II Approved Daily Volume, MGD 0.40
DEP approved daily volume shown above covers multiple sources (Y/N): N
Status (Active/Inactive/Emergency/Abandoned): Active
Pump Capacity, gpm: 275
Manifolded/Grouped with Other Sources for Metering Purposes (Y/N): N

Total Annual, Average Day and Peak Day Flows from Section E of DEP Annual Statistical Report:*

	1998	1999	2000	2001	2002
Total Annual, MG	124.88	104.66	106.67	115.89	99.79
Avg. Day, MGD (365 days)	0.34	0.29	0.29	0.32	0.27
Peak Day, MGD	0.46		0.39	0.45	0.38

*-If Manifolded/Grouped with other sources - Volumes are Shown in the first source, and are shown as 0 for the remaining sources.

Source Name: Green St Wellfield (3 GPW)
DEP Source ID: 2138000-02G
Basin: BLACKSTONE
DEP Zone II Approved Daily Volume, MGD 0.25
DEP approved daily volume shown above covers multiple sources (Y/N): N
Status (Active/Inactive/Emergency/Abandoned): Active
Pump Capacity, gpm: 150
Manifolded/Grouped with Other Sources for Metering Purposes (Y/N): N

Total Annual, Average Day and Peak Day Flows from Section E of DEP Annual Statistical Report:*

	1998	1999	2000	2001	2002
Total Annual, MG	27.67	15.07	31.01	30.41	24.58
Avg. Day, MGD (365 days)	0.08	0.04	0.08	0.08	0.07
Peak Day, MGD	0.26		0.28	0.19	0.12

*-If Manifolded/Grouped with other sources - Volumes are Shown in the first source, and are shown as 0 for the remaining sources.

Appendix E

Overview of Future Water Supplies

**Overview of Future Water Supplies
Town of Hopedale**

Current Demand

Supplier PWS ID	Supplier Name	1998-2002 Avg. Day Demand, MGD
2138000	Hopedale Water Department	0.45
Hopedale Total:		0.45

Future Demands

EOEA Buildout Average Day Demand, MGD: 0.73
 EOEA Buildout Additional Average Day Demand, MGD:0.27

Potential New Supplies

Supplier PWS ID	Source	Pumping Rate, gpm	Avg. Daily Vol., MGD



EXHIBIT

B

Map 3



Land Potentially Available for Future Groundwater Supplies

Hopedale







-  Potential groundwater supply location
-  Potential public water supply protection area (Zone I)

Note: This analysis is based strictly on land use and land cover. These sites were not evaluated in this report for their potential to yield water.

Aquifers

-  High Yield
-  Medium Yield

Public Water Supplies

- | Hopedale Supplies | Other Supplies |
|---|---|
|  Ground Water |  Ground Water |
|  Surface Water |  Surface Water |
|  Proposed Well |  Proposed Well |

The following restrictions were used to identify potential areas for future public water supply:

1. No residential, commercial, industrial, transportation or waste disposal land use, or Tier 1A or true Tier 1B or 1E sites; and no land within 400 feet of any of the above.
2. No wetlands or land within 100 feet of a wetland.
3. No land under the control of a municipal conservation commission, no permanently protected state- or privately-owned open space, no federally-owned open space other than land owned by the Army Corps of Engineers, and no land within 400 feet of any of the above.

These restrictions are based on the best available data at the time of project completion.

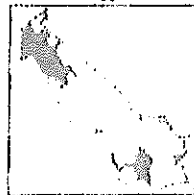


Date of aerial orthophoto: April 2001

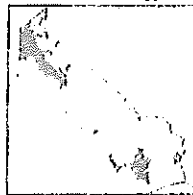
Hopedale



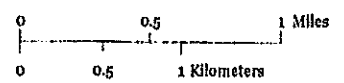
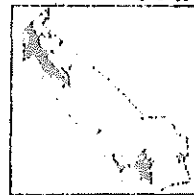
Restriction 1 applied:



Restrictions 1 and 2 applied:



Restrictions 1 through 3 applied:

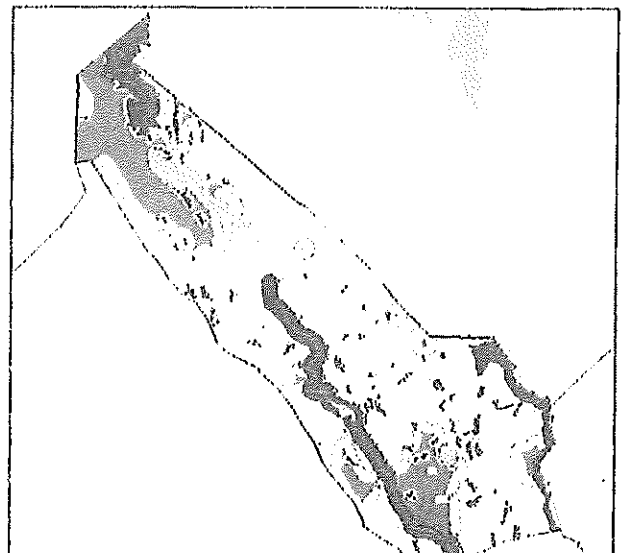
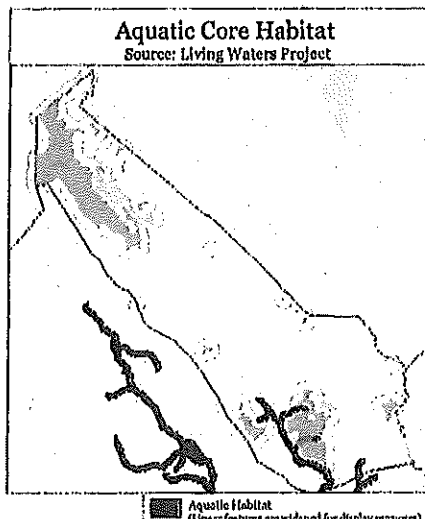
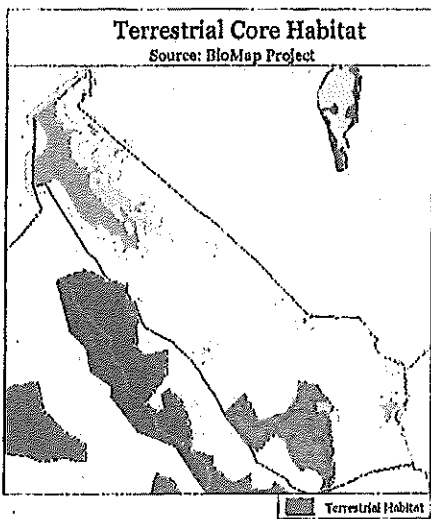


Natural Heritage and Endangered Species Program

Wetlands and Riparian Corridors

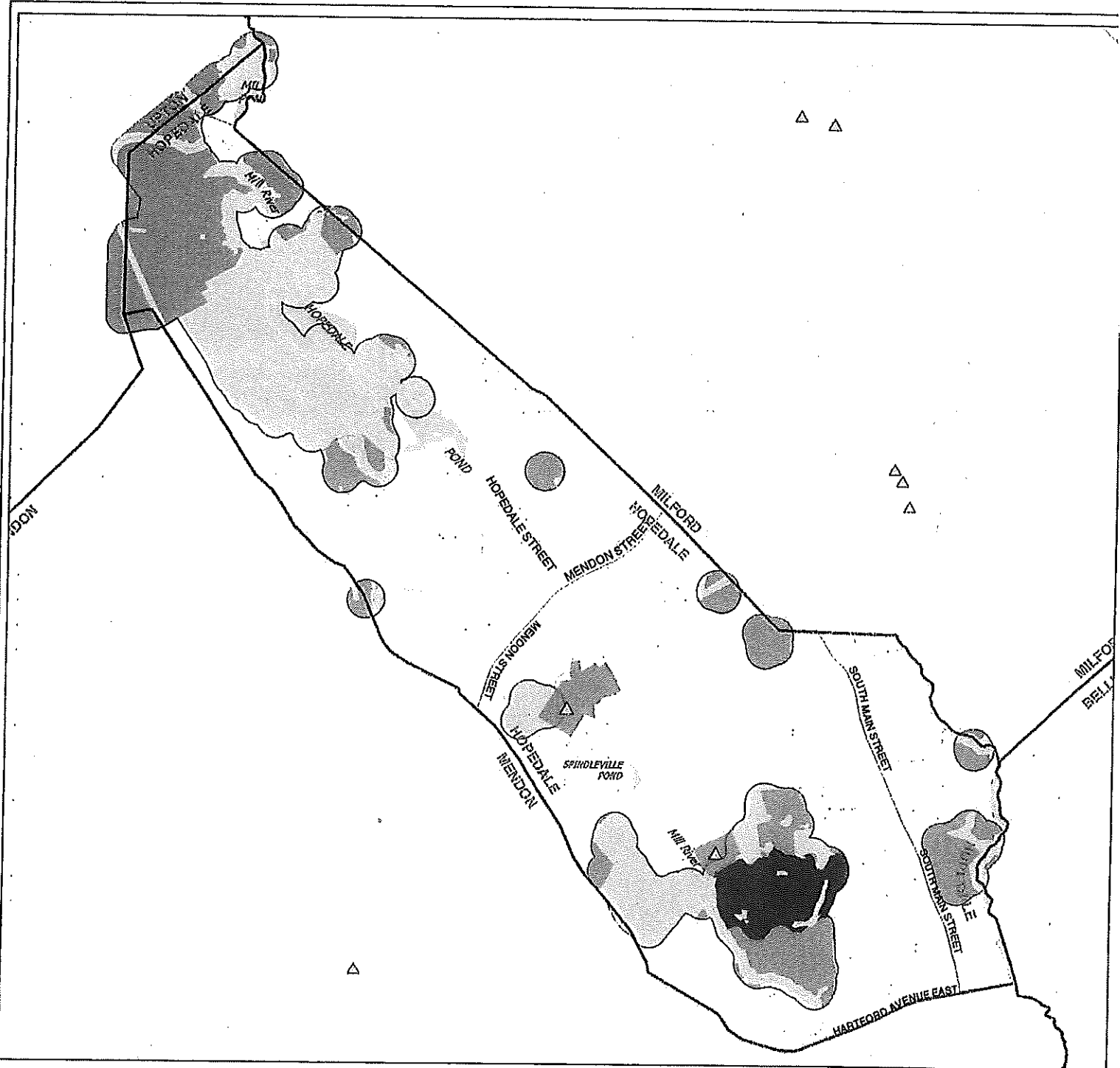
Terrestrial Core Habitat
Source: BioMap Project

Aquatic Core Habitat
Source: Living Waters Project



EXHIBIT

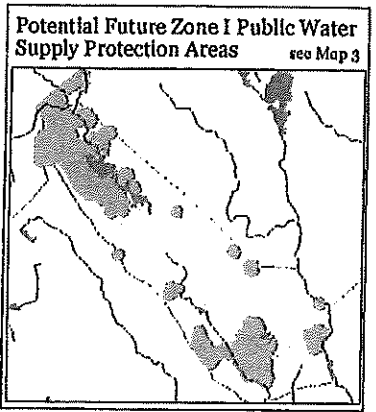
C



DRAFT

Map 4
 Current Land Use
 in
 Potential Public Water Supply
 Protection Areas

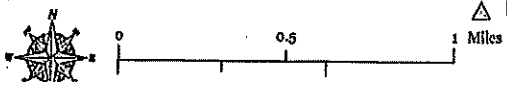
Hopedale



- Potential Future Water Supply Protection Area (Zone I)
- Undevelopable Land
 Criteria that may constrain land from development include slope, wetlands, River Protection Act buffers, 100-year flood zones, certain zoning overlays and rights-of-way, and restrictions outlined in an existing development plan.
- Protected Open Space
 within or contiguous with potential future Zone I other than federally-owned, permanently protected state- or privately-owned, or under the control of a municipal conservation commission (see Map 3).
- Municipal Boundary
- Public Water Supplies**
 - Hopedale Supplies Ground Water
 - Hopedale Supplies Surface Water
 - Hopedale Supplies Proposed Well
 - Other Purposes Ground Water
 - Other Purposes Surface Water
 - Other Purposes Proposed Well

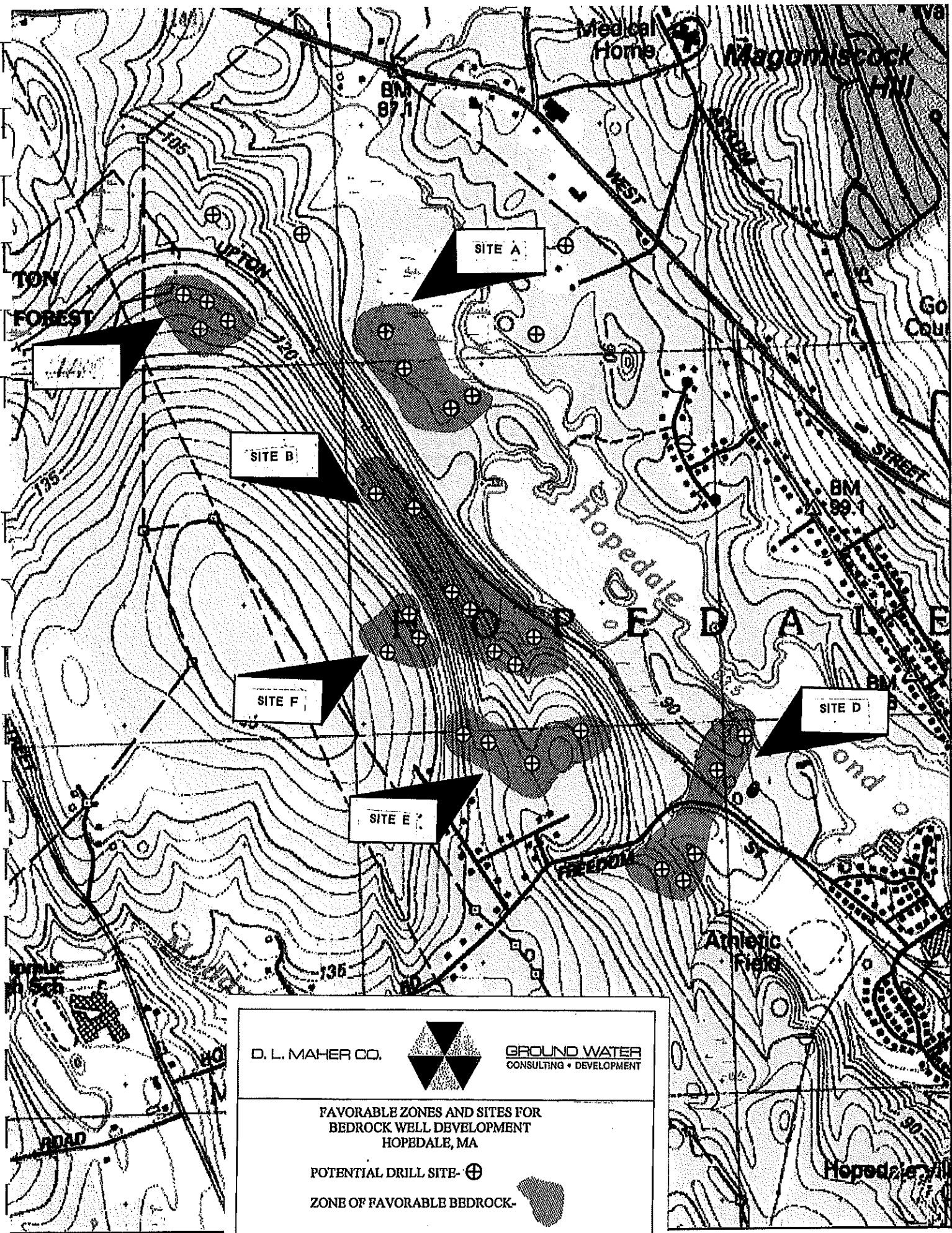
- Current Land Use**
- Agriculture
 - Natural Land/Undisturbed Vegetation
 - Urban open/Institutional/Recreation
 - Mining
 - Open Undeveloped Land

- Water features**
- River or Stream
 - Intermittent Stream
 - Lake or Pond



EXHIBIT

D



D. L. MAHER CO.		GROUND WATER CONSULTING • DEVELOPMENT
<p>FAVORABLE ZONES AND SITES FOR BEDROCK WELL DEVELOPMENT HOPEDALE, MA</p>		
<p>POTENTIAL DRILL SITE- ⊕</p>		
<p>ZONE OF FAVORABLE BEDROCK- </p>		
SCALE 1:10,000	DATE	FIG. 1

EXHIBIT

E



TOWN OF HOPEDALE

78 Hopedale Street - P.O. Box 7
Hopedale, Massachusetts 01747

Tel: 508-634-2203 ext. 212

Fax: 508-634-2200

**Board of Water & Sewer
Commissioners**

Christine Burke, Chair
James Morin
Robert Burns

September 12, 2018

To: Board of Selectmen
Planning Board
Town of Hopedale

From: Hopedale Water & Sewer Departments

Dear Members of the Boards of Selectmen and Planning Board:

We are in receipt of the Town of Hopedale's proposal for the Draper Falls and would like to take this opportunity to advise you of the current status of Hopedale's sewer collection system; water distribution system; current sewer capacity; the water department's Water Management Permit (WMP); and the current water pumping capacities. Although the proposal is in its early stages, we believe this information will be beneficial to both of your Boards moving forward.

Sewer Collection System

One of the primary issues with the sewer collection system is that all the sewerage in town from Chapel Street to the end of Dutcher Street, Jones Road, a large portion of West Street, Milford Country Club Condominiums and surrounding neighborhoods all flow not only under the current Draper facility, but also through it. All areas of Soward Street, Lake Street and Freedom Street also run through the building. The upper part of Pinecrest flows through an easement to the Bancroft Park sewer lines which in turn flow through the Draper property as well. Prospect Street and all areas including Dutcher Street flow under the current plant at Union Street. Adin Street, Hopedale Street, Depot Street and surrounding areas all flow through the property as well. These lines eventually meet at one manhole which runs under the Mill River to Fitzgerald Drive and then flows to the Waste Water Treatment Plant. We bring this configuration to your attention as the proposed plan shows demolition of portions of the building that the sewer lines flow through, and others where the sewer collection system runs under, as well as a significant amount of construction on top of these lines.

Water Distribution System

The water infrastructure is much better. Three taps on Hopedale Street off the department's 16-inch line are already installed, and the Freedom Street area is fed by a 12 inch line. The facility has one connection that would need to be cut and capped at the corner of Freedom Street and Hopedale Street. To supply sufficient fire protection to the proposed area, a new line from Mendon Street to Freedom Street would be in the Town's best interest. One issue

that requires further attention with reference to the distribution system is the increase in demand created by the proposed houses on the corner of Freedom Street and Bancroft Park. This area currently has a 12-inch water main that feeds the Pinecrest area.

Sewer Capacity

Section 8 of the proposal states that the repair of inflow and infiltration (I&I) on the existing sewer lines will create substantial capacity. Please be advised that in the past few years, the Department has invested significant time and capital funding to address capacity issues in much of that area. Additional I&I work will clearly help, but we do not believe it will create a substantial increase in capacity.

The Waste Water Treatment Plant (WWTP) is designed for .588 Million Gallons a Day (MGD). For your reference, this current summer has been very dry with the water table very low. This past month the Department was averaging approximately .260 MGD, well below design. A few weeks ago, we had a heavy rain event on a Saturday afternoon for approximately two hours. During this rain event, the plant saw flows in the area of 1.3 MGD. During the wet season of fall and more so the spring, the flows with the assistance of higher ground water levels average .6 to .7 MGD, exceeding the design capabilities of the plant. Rainy events during this time we can see in excess of 2.0 to 3.0 MGD.

Water Management Permit

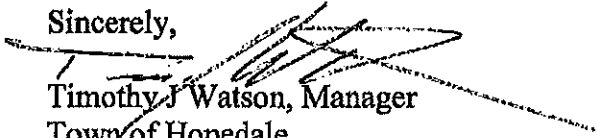
With reference to the water system, the Department holds a Water Management Act Permit (WMA) which authorizes us to withdraw no more than .410 MGD. Our Water Treatment plant is designed to meet the permit and we can treat up to 410 gallons per-minute (GPM). In the past, due to design flaws, our ability to treat this amount of water was unattainable. Over the last few years, we have upgraded the plant with the installation of a raw water storage tank and booster system that went on-line this June and has allowed us to meet these goals. As you have probably noticed, this has been the first year in many years that the Department has not issued additional water restrictions outside those required under the WMA Permit. Once the booster station came on line we began pumping permit levels for the first time in the Department's history. However, unanticipated issues arose as well. Although we could pump and clean this raw water at maximum allowed volumes, we observed the wells beginning to fail. We had experienced this issue in the past, but not at that rate we are currently experiencing. For example, we are pumping 80 GPM less in August (91200 gallons per day) due to the wells plugging. Additionally, we anticipated pumping and treating more water with the new station, but did not expect demand to meet our permit. Although we are keeping our storage tank full, demand has risen considerably without water restrictions. Needless to say, the cleaning of these wells and the frequency will be critical moving forward, doubling the cost as we will have to clean the sources biannually. We typically clean all sources prior to high demand each spring only at a cost of \$60,000 to \$70,000 annually. We will now need funding upwards of \$140,000 each year to simply meet current demands.

Section 8 of your report mentions an additional water storage tank. This will surely be helpful, but the problem is we still need the water to fill it. To supply an additional 556 units as we currently stand, would be very difficult and would certainly require water restrictions year-round. An additional source would be the best solution; however, even if additional sources were found, the current WMA permit and treatment plant are at full capacity. Not only would a new permit from EPA and DEP be required, but extensive treatment plant upgrades or an additional water treatment plant would be required.

There is an additional issue regarding the Water system which is the Zone II wellhead protection area. In short, this is an area that needs to be protected as it lies within the zone of influence that can affect the quality of the Department's wells and ground water. Any containments introduced into this area can reasonably be expected to enter and affect the ground water which supplies these wells. The Town has the right and/or ability to regulate these areas in order to ensure the protection of the town's drinking water sources. Please be advised that the land that would be transferred to the Railroad falls within this zone. The Department's primary concern is that if and when the land is given to the Railroad, the Town will have no ability to regulate the use of this land and protection of this land under the so-called "pre-emptive rights" of the Railroad. As you know, pre-emption means that the Railroad is not subject to any state or local law and there have been considerable law suits brought by various communities and the railroad has prevailed.

On behalf of our Board, we would encourage the Board of Selectmen to hold a department manager's meeting to give all department managers the opportunity to read the proposal and comment in writing on the effect which the proposal may have on their department.

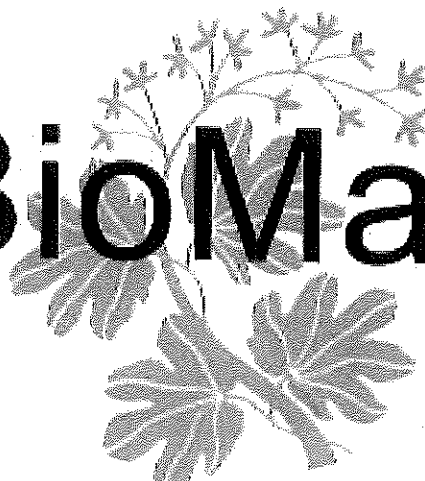
Sincerely,



Timothy J. Watson, Manager
Town of Hopedale
Water & Sewer Departments

EXHIBIT

F



BioMap2

CONSERVING THE BIODIVERSITY OF
MASSACHUSETTS IN A CHANGING WORLD

Hopedale

Produced in 2012

*This report and associated map provide information about
important sites for biodiversity conservation in your area.*

*This information is intended for conservation planning, and is
not intended for use in state regulations.*



**Natural Heritage
& Endangered Species
Program**
Massachusetts Division of Fisheries & Wildlife

**The Nature
Conservancy** 
Protecting nature. Preserving life.



BioMap2

Conserving the Biodiversity of Massachusetts in a Changing World

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Elements of *BioMap2* Critical Natural Landscapes

Critical Natural Landscape Summaries



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phone: 508-389-6360 fax: 508-389-7890

For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/dnr/sp.



BioMap2

Conserving the Biodiversity of Massachusetts in a Changing World

Introduction

The Massachusetts Department of Fish & Game, through the Division of Fisheries and Wildlife's Natural Heritage & Endangered Species Program (NHESP), and The Nature Conservancy's Massachusetts Program developed *BioMap2* to protect the state's biodiversity in the context of climate change.

BioMap2 combines NHESP's 30 years of rigorously documented rare species and natural community data with spatial data identifying wildlife species and habitats that were the focus of the Division of Fisheries and Wildlife's 2005 State Wildlife Action Plan (SWAP). *BioMap2* also integrates The Nature Conservancy's assessment of large, well-connected, and intact ecosystems and landscapes across the Commonwealth, incorporating concepts of ecosystem resilience to address anticipated climate change impacts.

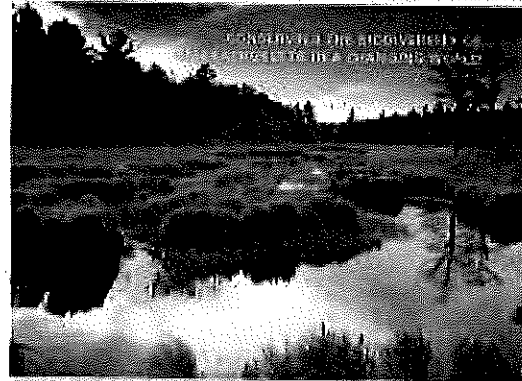
Protection and stewardship of *BioMap2* Core Habitat and Critical Natural Landscape is essential to safeguard the diversity of species and their habitats, intact ecosystems, and resilient natural landscapes across Massachusetts.

What Does Status Mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act, M.G.L. c.131A, and its implementing regulations 321 CMR 10.00. Rare species are categorized as Endangered, Threatened or of Special Concern according to the following:

- Endangered species are in danger of extinction throughout all or a significant portion of their range or are in danger of extirpation from Massachusetts.

BioMap2



© Massachusetts Department of Fisheries and Wildlife, The Nature Conservancy

Get your copy of the *BioMap2* report! Download from www.mass.gov/nhesp or contact Natural Heritage at 508-389-6360 or natural.heritage@state.ma.us.

- Threatened species are likely to become Endangered in Massachusetts in the foreseeable future throughout all or a significant portion of their range.
- Special Concern species have suffered a decline that could threaten the species if allowed to continue unchecked or occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become Threatened in Massachusetts.

In addition NHESP maintains an unofficial watch list of plants that are tracked due to potential conservation interest or concern, but are not regulated under the Massachusetts Endangered Species Act or other laws or regulations. Likewise, described natural communities are not regulated by any law or regulations, but they can help to identify ecologically important areas that are worthy of



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protection. The status of natural communities reflects the documented number and acreages of each community type in the state:

- Critically Imperiled communities typically have 5 or fewer documented sites or have very few remaining acres in the state.
- Imperiled communities typically have 6-20 sites or few remaining acres in the state.
- Vulnerable communities typically have 21-100 sites or limited acreage across the state.
- Secure communities typically have over 100 sites or abundant acreage across the state; however, excellent examples are identified as Core Habitats to ensure continued protection.

In 2005 the Massachusetts Division of Fisheries and Wildlife completed a comprehensive State Wildlife Action Plan (SWAP) documenting the status of Massachusetts wildlife and providing recommendations to help guide wildlife conservation decision-making. SWAP includes all the wildlife species listed under the Massachusetts Endangered Species Act (MESA), as well as more than 80 species that need conservation attention but do not meet the requirements for inclusion under MESA. The SWAP document is organized around habitat types in need of conservation within the Commonwealth. While the original BioMap focused primarily on rare species protected under MESA, *BioMap2* also addresses other Species of Conservation Concern, their habitats, and the ecosystems that support them to create a spatial representation of most of the elements of SWAP.

BioMap2: One Plan, Two Components

BioMap2 identifies two complementary spatial layers, Core Habitat and Critical Natural Landscape.

Core Habitat identifies key areas that are critical for the long-term persistence of rare species and other Species of Conservation Concern, as well as a wide diversity of natural communities and intact ecosystems across the Commonwealth. Protection of Core Habitats will contribute to the conservation of specific elements of biodiversity.

Critical Natural Landscape identifies large natural Landscape Blocks that are minimally impacted by development. If protected, these areas will provide habitat for wide-ranging native species, support intact ecological processes, maintain connectivity among habitats, and enhance ecological resilience to natural and anthropogenic disturbances in a rapidly changing world. Areas delineated as Critical Natural Landscape also include buffering upland around wetland, coastal, and aquatic Core Habitats to help ensure their long-term integrity.

The long-term persistence of Massachusetts biological resources requires a determined commitment to land and water conservation. Protection and stewardship of both Critical Natural Landscapes and Core Habitats are needed to realize the biodiversity conservation vision of *BioMap2*.

Components of Core Habitat

Core Habitat identifies specific areas necessary to promote the long-term persistence of rare species, other Species of Conservation Concern, exemplary natural communities, and intact ecosystems.

Rare Species

There are 432 native plant and animal species listed as Endangered, Threatened or Special Concern under the Massachusetts Endangered Species Act (MESA) based on their rarity, population trends, and threats to survival. For



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phone: 508-389-6360 fax: 508-389-7890



Table 1. Species of Conservation Concern described in the State Wildlife Action Plan and/or included on the MESA List and for which habitat was mapped in BioMap2. Note that plants are not included in SWAP, and that marine species such as whales and sea turtles are not included in BioMap2.

Taxonomic Group	MESA-listed Species	Non-listed Species of Conservation Concern
Mammals	4	5
Birds	27	23
Reptiles	10	5
Amphibians	4	3
Fish	10	17
Invertebrates	102	9
Plants	256	0
Total	413	62

BioMap2, NHESP staff identified the highest quality habitat sites for each non-marine species based on size, condition, and landscape context.

Other Species of Conservation Concern

In addition to species on the MESA List (described previously), the State Wildlife Action Plan (SWAP) identifies 257 wildlife species and 22 natural habitats most in need of conservation within the Commonwealth. BioMap2 includes species-specific habitat areas for 45 of these species and habitat for 17 additional species which was mapped with other coarse-filter and fine-filter approaches.

Priority Natural Communities

Natural communities are assemblages of plant and animal species that share a common environment and occur together repeatedly on the landscape. BioMap2 gives conservation

priority to natural communities with limited distribution and to the best examples of more common types.

Vernal Pools

Vernal pools are small, seasonal wetlands that provide important wildlife habitat, especially for amphibians and invertebrate animals that use them to breed. BioMap2 identifies the top 5 percent most interconnected clusters of Potential Vernal Pools in the state.

Forest Cores

In BioMap2, Core Habitat includes the best examples of large, intact forests that are least impacted by roads and development, providing critical habitat for numerous woodland species. For example, the interior forest habitat defined by Forest Cores supports many bird species sensitive to the impacts of roads and development, such as the Black-throated Green Warbler, and helps maintain ecological processes found only in unfragmented forest patches.

Wetland Cores

BioMap2 used an assessment of Ecological Integrity to identify the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Aquatic Cores

To delineate integrated and functional ecosystems for fish species and other aquatic





Species of Conservation Concern, beyond the species and exemplary habitats described above, *BioMap2* identifies intact river corridors within which important physical and ecological processes of the river or stream occur.

Components of Critical Natural Landscape

Critical Natural Landscape identifies intact landscapes in Massachusetts that are better able to support ecological processes and disturbance regimes, and a wide array of species and habitats over long time frames.

Landscape Blocks

BioMap2 identifies the most intact large areas of predominately natural vegetation, consisting of contiguous forests, wetlands, rivers, lakes, and ponds, as well as coastal habitats such as barrier beaches and salt marshes.

Upland Buffers of Wetland and Aquatic Cores

A variety of analyses were used to identify protective upland buffers around wetlands and rivers.

Upland Habitat to Support Coastal Adaptation

BioMap2 identifies undeveloped lands adjacent to and up to one and a half meters above existing salt marshes as Critical Natural Landscapes with high potential to support inland migration of salt marsh and other coastal habitats over the coming century.

The conservation areas identified by *BioMap2* are based on breadth and depth of data, scientific expertise, and understanding of Massachusetts' biodiversity. The numerous sources of information and analyses used to

Legal Protection of Biodiversity

BioMap2 presents a powerful vision of what Massachusetts would look like with full protection of the land most important for supporting the Commonwealth's biodiversity. While *BioMap2* is a planning tool with no regulatory function, all state-listed species enjoy legal protection under the Massachusetts Endangered Species Act (M.G.L. c.131A) and its implementing regulations (321 CMR 10.00). Wetland habitat of state-listed wildlife is also protected under the Wetlands Protection Act Regulations (310 CMR 10.00). The Natural Heritage Atlas contains maps of Priority Habitats and Estimated Habitats, which are used, respectively, for regulation under the Massachusetts Endangered Species Act and the Wetlands Protection Act. For more information on rare species regulations, and to view Priority and Estimated Habitat maps, please see the Regulatory Review page at <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/>.

BioMap2 is a conservation planning tool that does not, in any way, supplant the Estimated and Priority Habitat Maps which have regulatory significance. Unless and until the *BioMap2* vision is fully realized, we must continue to protect our most imperiled species and their habitats.

create Core Habitat and Critical Natural Landscape are complementary, and outline a comprehensive conservation vision for Massachusetts, from rare species to intact landscapes. In total, these robust analyses define a suite of priority lands and waters that, if permanently protected, will support Massachusetts' natural systems for generations to come.





BioMap2

Conserving the Biodiversity of Massachusetts in a Changing World

Understanding Core Habitat Summaries

Following the Town Overview, there is a descriptive summary of each Core Habitat and Critical Natural Landscape that occurs in your city or town. These summaries highlight some of the outstanding characteristics of each Core Habitat and Critical Natural Landscape, and will help you learn more about your city or town's biodiversity. You can find out more information about many of these species and natural communities by looking at specific fact sheets at www.mass.gov/nhisp.

Additional Information

For copies of the full *BioMap2* report, the Technical Report, and an [interactive mapping tool](#), visit the *BioMap2* [website](#) via the Land Protection and Planning tab at www.mass.gov/nhisp. If you have any questions about this report, or if you need help protecting land for biodiversity in your community, the Natural Heritage & Endangered Species Program staff looks forward to working with you.

Contact the Natural Heritage & Endangered Species Program

By phone 508-389-6360
By fax 508-389-7890
By email natural.heritage@state.ma.us
By Mail 100 Hartwell Street, Suite 230
West Boylston, MA 01583

The GIS datalayers of *BioMap2* are available for download from MassGIS at www.mass.gov/mgis.



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1 Rabbit Hill Road, Westborough, MA 01581
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Town Overview

Hopedale lies within the Southern New England Coastal Plains and Hills Ecoregion, an area comprised of plains with a few low hills. Forests are mainly central hardwoods with some transition hardwoods and some elm-ash-red maple and red and white pine. Many major rivers drain this area. BioMap2 elements are found in the wetlands above Hopedale Pond, on the hillsides to the west of the pond, and the Mill River.



Hopedale at a Glance

- Total Area: 3,419 acres (5.3 square miles)
- Human Population in 2010: 5,911
- Open space protected in perpetuity: 76 acres, or 2.2% percent of total area*
- BioMap2 Core Habitat: 610 acres
- BioMap2 Core Habitat Protected: 32 acres or 5.3%
- BioMap2 Critical Natural Landscape: 342 acres
- BioMap2 Critical Natural Landscape Protected: 4 acres or 1.1%

BioMap2 Components

Core Habitats

- 2 Wetland Cores
- 1 Aquatic Core
- 2 Species of Conservation Concern Cores**
 - 2 insects

Critical Natural Landscapes

- 1 Landscape Block
- 1 Wetland Core Buffer

* Calculated using MassGIS data layer "Protected and Recreational Open Space—March, 2012".



** See next pages for complete list of species, natural communities and other biodiversity elements.





BioMap2 Core Habitat and Critical Natural Landscape in Hopedale



-  BioMap2 Core Habitat
-  BioMap2 Critical Natural Landscape

1 Mile



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BioMap2

Conserving the Biodiversity of Massachusetts in a Changing World

**Species of Conservation Concern, Priority and Exemplary Natural Communities,
and Other Elements of Biodiversity in Hopedale**

Insects

Butterflies

Oak Hairstreak, (*Satyrium favonius*), SC

Dragonflies

Brook Snaketail, (*Ophiogomphus aspersus*), SC

Other BioMap2 Components

Aquatic Core

Wetland Core

Landscape Block

Wetland Core Buffer

E = Endangered

T = Threatened

SC = Special Concern

S1 = Critically Imperiled communities, typically 5 or fewer documented sites or very few remaining acres in the state.

S2 = Imperiled communities, typically 6-20 sites or few remaining acres in the state.

S3 = Vulnerable communities, typically have 21-100 sites or limited acreage across the state.



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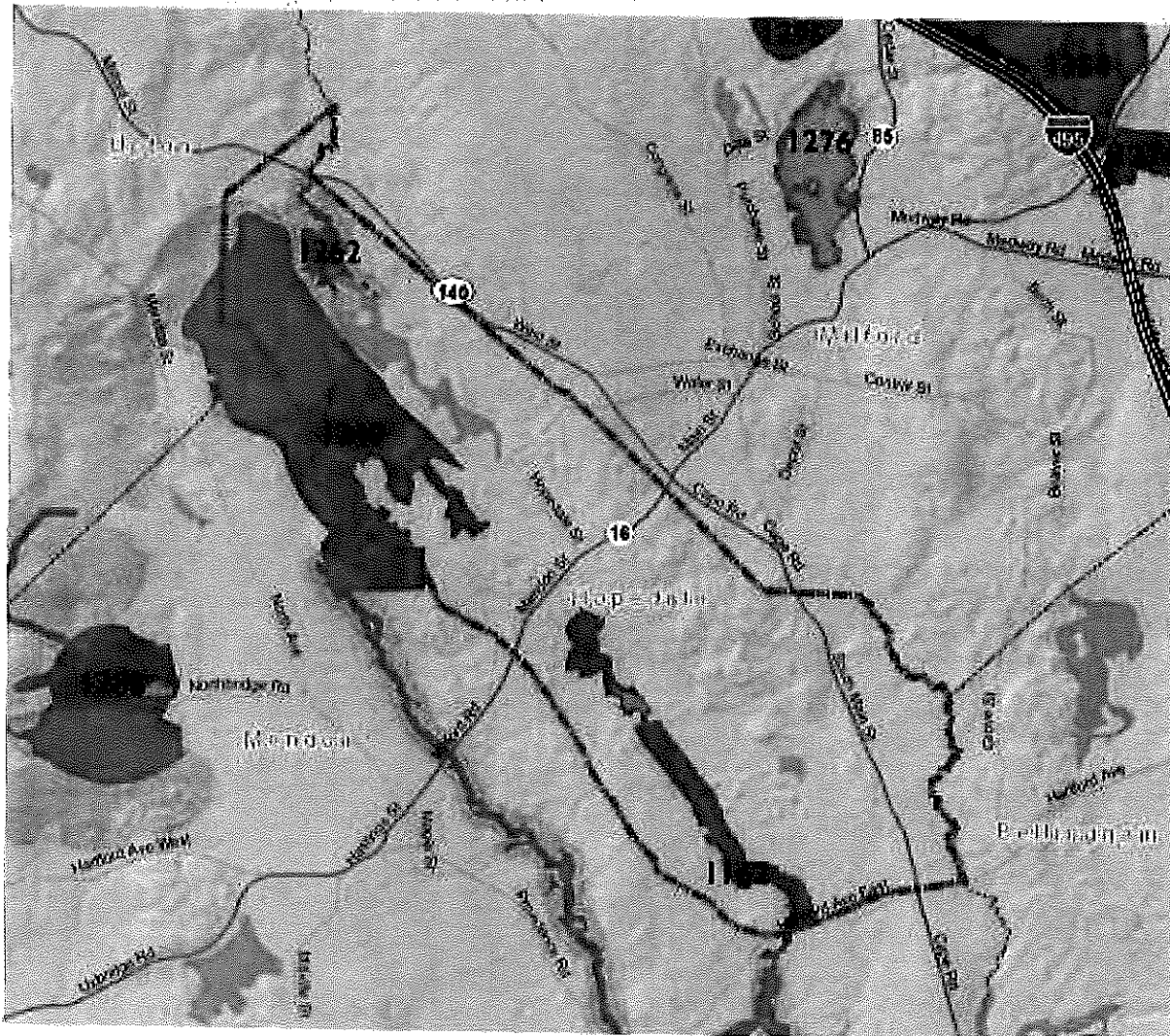




BioMap2

Conserving the Biodiversity of Massachusetts in a Changing World

BioMap2 Core Habitat in Hopedale

Core IDs correspond with the following element lists and summaries:



-  BioMap2 Core Habitat
-  BioMap2 Critical Natural Landscape

1 Mile



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Elements of BioMap2 Cores

This section lists all elements of BioMap2 Cores that fall *entirely or partially* within Hopedale. The elements listed here may not occur within the bounds of Hopedale.

Core 1162

Species of Conservation Concern

Brook Snaketail

Ophiogomphus aspersus

SC

Core 1249

Aquatic Core

Wetland Core

Species of Conservation Concern

Climbing Fern

Lygodium palmatum

SC

Triangle Floater

Alismidonta undulata

Non-listed SWAP

Creeper

Strophitis undulatus

SC

Oak Hairstreak

Satyrium favonius

SC

American Brook Lamprey

Lampetra appendix

T

Marbled Salamander

Ambystoma opacum

T

Eastern Box Turtle

Terrapene carolina

SC

Core 1262

Wetland Core





Core Habitat Summaries

Core 1162

A 162-acre Core Habitat featuring a Species of Conservation Concern.

Brook Snakelalls are dragonflies whose nymphs can be found in clear, sand-bottomed streams with intermittent rapids, often flowing through dense woodland.

Core 1249

A 3,367-acre Core Habitat featuring Aquatic Core, Wetland Core, and Species of Conservation Concern.

Aquatic Cores are integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern. To delineate these, *BioMap2* identified intact river corridors within which important physical and ecological processes of the river or stream occur. To identify those areas integrally connected to each river and stream, each river segment was buffered 30 meters. All wetlands wholly or partially contained within this buffer were then included, and the combination of the river channel, the adjacent buffer, and the connected wetlands make up the riverine Core Habitat.

To enhance the biodiversity value of wetlands selected as Core Habitat, *BioMap2* maps the most intact wetlands in each ecological region of the state. These intact wetlands in diverse settings may be thought of as representing the ecological stage, and are most likely to support a diversity of wetland types over time, even as different plant and animal species (the actors on the ecological stage) shift in response to climate change.

Climbing Fern does not have the characteristic overall shape of most ferns. Instead, it is an evergreen, ivy-like plant which sprawls over the ground or climbs clockwise short distances up shrubs and coarse herbs. Climbing Fern grows in moist pine-oak-maple woods with an open understory, in moist thickets, and along stream margins. This plant prefers acidic soils that are sandy and rich in humus, but nutrient-poor.

Triangle Floaters are freshwater mussels commonly found in low-gradient river reaches with sand and gravel substrates and low to moderate water velocities, although they are found in a wide range of substrate and flow conditions.

Creepers are freshwater mussels that inhabit low-gradient reaches of small to large rivers with sand or gravel substrates. Cool to warm water with diverse fish assemblages best support Creepers.

In Massachusetts, the Oak Hairstreak inhabits xeric and open oak woodland and barrens on rocky uplands and sandplains. Adults are often found nectaring in dry, open, weedy or scrub areas, such as old fields, clearings, powerline or pipeline cuts, abandoned gravel pits, etc. New Jersey tea (*Ceanothus americanus*), dogbanes (*Apocynum* spp.), milkweeds (*Asclepias* spp.), and blueberries (*Vaccinium* spp.) are favored nectar sources, although others are used. Larvae feed on various oaks (*Quercus* spp.) across the species' range; particular oak species have not been documented in Massachusetts.





BioMap2

Conserving the Biodiversity of Massachusetts in a Changing World

The American Brook Lamprey is a primitive, eel-like fish. They live in clear, cool streams. Adults spawn in pea gravel substrates, while the larvae live in areas with substrates consisting of fine sand and muck, often in backwaters or stream margins.

Adult and juvenile Marbled Salamanders inhabit upland forests during most of the year, where they reside in small-mammal burrows and other subsurface retreats. Adults migrate during late summer or early fall to breed in dried portions of vernal pools, swamps, marshes, and other predominantly fish-free wetlands. Eggs are deposited under logs, leaf-litter, or grass tussocks and hatch after being inundated by fall rains. Larvae metamorphose during late spring, whereupon they disperse into upland forest.

The Eastern Box Turtle is a terrestrial turtle, inhabiting many dry and moist woodland and early successional habitat. Development, roads, collection, and disease are the primary conservation concerns.

Core 1262

A 48-acre Core Habitat featuring Wetland Core.

To enhance the biodiversity value of wetlands selected as Core Habitat, *BioMap2* maps the most intact wetlands in each ecological region of the state. These intact wetlands in diverse settings may be thought of as representing the ecological stage, and are most likely to support a diversity of wetland types over time, even as different plant and animal species (the actors on the ecological stage) shift in response to climate change.



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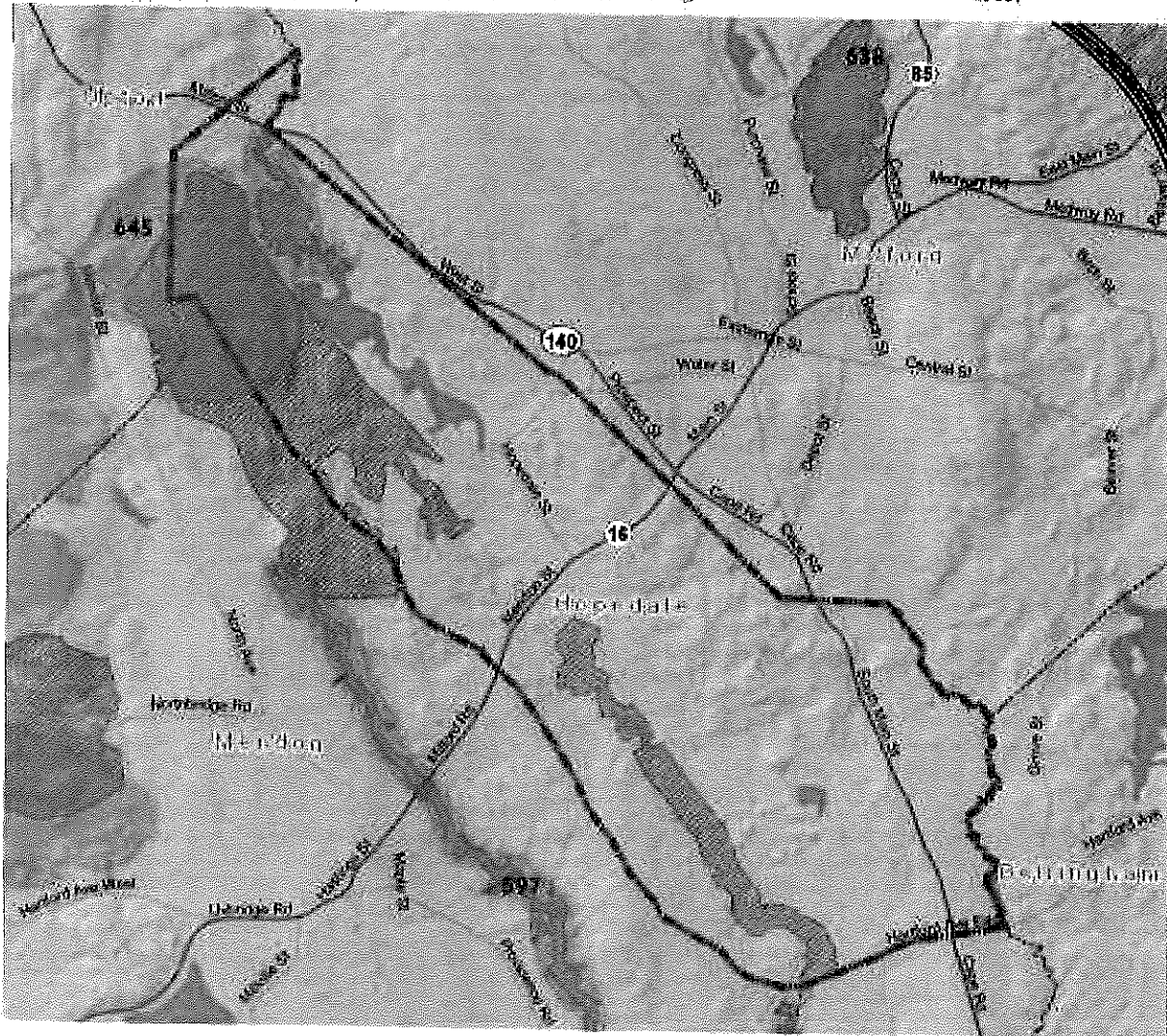
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For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.



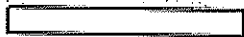
BioMap2 Critical Natural Landscape in Hopedale

Critical Natural Landscape IDs correspond with the following element lists and summaries.



-  BioMap2 Core Habitat
-  BioMap2 Critical Natural Landscape

1 Mile



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BioMap2

Conserving the Biodiversity of Massachusetts in a Changing World

Elements of BioMap2 Critical Natural Landscapes

This section lists all elements of BioMap2 Critical Natural Landscapes that fall *entirely or partially* within Hopedale. The elements listed here may not occur within the bounds of Hopedale.

CNL 645

Landscape Block

Aquatic Core Buffer

Wetland Core Buffer



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Critical Natural Landscape Summaries

CNL 645

A 2,992-acre Critical Natural Landscape featuring Aquatic Core Buffer, Wetland Core Buffer and Landscape Block.

Landscape Blocks, the primary component of Critical Natural Landscapes, are large areas of intact predominately natural vegetation, consisting of contiguous forests, wetlands, rivers, lakes, and ponds, as well as coastal habitats such as barrier beaches and salt marshes. Pastures and power-line rights-of-way, which are less intensively altered than most developed areas, were also included since they provide habitat and connectivity for many species. Collectively, these natural cover types total 3.6 million acres across the state. An Ecological Integrity assessment was used to identify the most intact and least fragmented areas. These large Landscape Blocks are most likely to maintain dynamic ecological processes such as buffering, connectivity, natural disturbance, and hydrological regimes, all of which help to support wide-ranging wildlife species and many other elements of biodiversity.

In order to identify critical Landscape Blocks in each ecoregion, different Ecological Integrity thresholds were used to select the largest intact landscape patches in each ecoregion while avoiding altered habitat as much as possible. This ecoregional representation accomplishes a key goal of *BioMap2* to protect the ecological stages that support a broad suite of biodiversity in the context of climate change. Blocks were defined by major roads, and minimum size thresholds differed among ecoregions to ensure that *BioMap2* includes the best of the best in each ecoregion.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.



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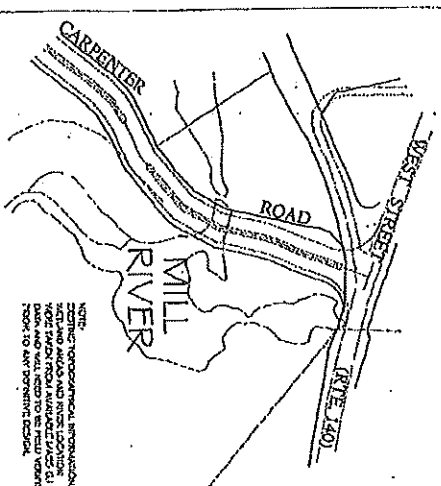


Natural Heritage &
Endangered Species Fund

To learn more about the Natural Heritage & Endangered Species Program and the Commonwealth's rare species, visit our web site at www.mass.gov/nhesp.

EXHIBIT

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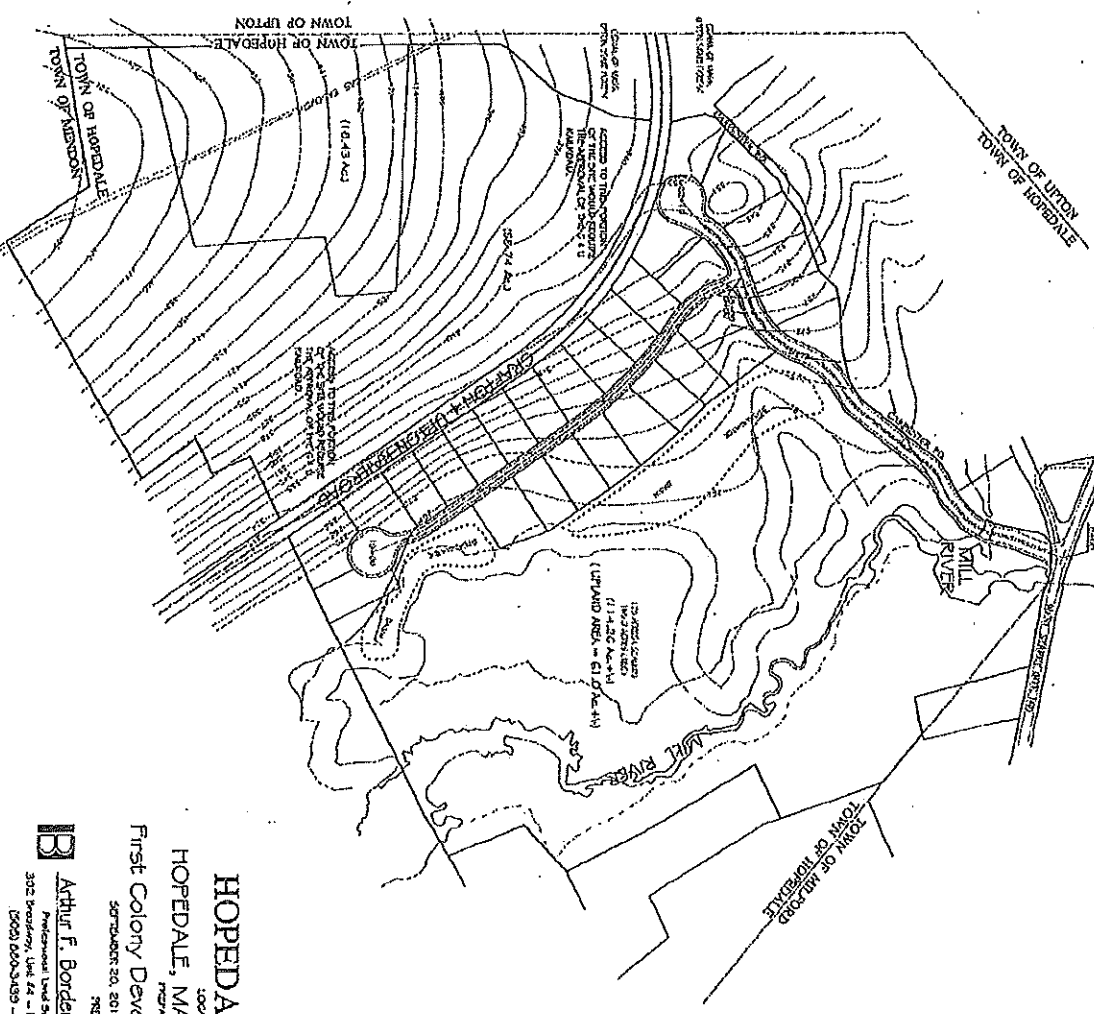
ENTRANCE DETAIL
SCALE 1" = 100 FT.

NOTE: THE PROPOSED DRIVEWAY OFF OF WEST STREET WILL BE CONSTRUCTED TO MEET THE REQUIREMENTS OF THE LOCAL GOVERNMENT. THE DRIVEWAY SHALL BE CONSTRUCTED TO MEET THE REQUIREMENTS OF THE LOCAL GOVERNMENT. THE DRIVEWAY SHALL BE CONSTRUCTED TO MEET THE REQUIREMENTS OF THE LOCAL GOVERNMENT. THE DRIVEWAY SHALL BE CONSTRUCTED TO MEET THE REQUIREMENTS OF THE LOCAL GOVERNMENT.

PLAN SQUAREMETER:
TOTAL LENGTH OF ROADWAYS = 4,110 LIN. FT.
TOTAL LOT AREA = 40,000 S.F.
TOTAL NUMBER OF LOTS = 29
TOTAL NUMBER OF HOUSES = 29
TOTAL NUMBER OF HOUSES = 29
TOTAL NUMBER OF HOUSES = 29

NOTE: EACH LOT WILL BE SERVED BY AN OUTLET WELL. THE OUTLET WELL SHALL BE LOCATED AT THE END OF THE LANEWAY. THE OUTLET WELL SHALL BE LIMITED TO 450 G.P.D. PER LOT. THE OUTLET WELL SHALL BE LIMITED TO 450 G.P.D. PER LOT. THE OUTLET WELL SHALL BE LIMITED TO 450 G.P.D. PER LOT.

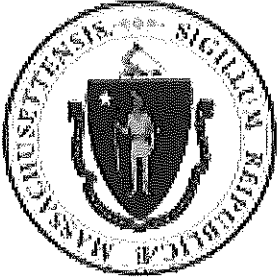
HOPEDALE ZONING TABLE:
ZONE: INDUSTRIAL
MIN. LOT AREA = 40,000 S.F.
MIN. FRONTAGE = 150 FT.
MIN. FRONTAGE = 150 FT.
MIN. FRONTAGE = 150 FT.
MIN. FRONTAGE = 150 FT.



HOPEDALE PARK
HOPEDALE, MASSACHUSETTS
First Colony Development Co., LLC
302 Broadway, Unit 22 - Boston, Massachusetts 02267
Professional Land Surveyor & Civil Engineer
Arthur F. Borden & Associates, Inc.
302 Broadway, Unit 22 - Boston, Massachusetts 02267
Professional Land Surveyor & Civil Engineer

EXHIBIT

H



The Commonwealth of Massachusetts
William Francis Galvin

Minimum Fee: \$100.00

Secretary of the Commonwealth, Corporations Division
 One Ashburton Place, 17th floor
 Boston, MA 02108-1512
 Telephone: (617) 727-9640

Annual Report

(General Laws, Chapter 156D, Section 16.22; 950 CMR 113.57)

Identification Number: 046002751

1. Exact name of the corporation: GRAFTON & UPTON RAILROAD COMPANY

2. Jurisdiction of Incorporation: State: MA Country:

3,4. Street address of the corporation registered office in the commonwealth and the name of the registered agent at that office:

Name: JON DELLI PRISCOLI
 No. and Street: 42 WESTBORO RD
 City or Town: NORTH GRAFTON State: MA Zip: 01536 Country: USA

5. Street address of the corporation's principal office:

No. and Street: 42 WESTBORO RD
 City or Town: NORTH GRAFON State: MA Zip: 01536 Country: USA

6. Provide the name and addresses of the corporation's board of directors and its president, treasurer, secretary, and if different, its chief executive officer and chief financial officer.

Title	Individual Name First, Middle, Last, Suffix	Address (no PO Box) Address, City or Town, State, Zip Code
PRESIDENT	JON MARK DELLI PRISCOLI	42 WESTBORO RD NORTH GRAFTON, MA 01536 USA
TREASURER	JON MARK DELLI PRISCOLI	42 WESTBORO RD NORTH GRAFTON, MA 01536 USA
SECRETARY	JON MARK DELLI PRISCOLI	42 WESTBORO RD NORTH GRAFTON, MA 01536 USA
DIRECTOR	JON MARK DELLI PRISCOLI	42 WESTBORO RD NORTH GRAFTON, MA 01536 USA

7. Briefly describe the business of the corporation:

RAILROAD

8. Capital stock of each class and series:

	Par Value Per Share	Total Authorized by Articles	Total Issued

9. Check here if the stock of the corporation is publicly traded:

10. Report is filed for fiscal year ending: 12/31/ 2017

Signed by JON MARK DELLI PRISCOLI, its PRESIDENT
on this 17 Day of May, 2018

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EXHIBIT

I



The Commonwealth of Massachusetts
William Francis Galvin

Minimum Fee: \$100.00

Secretary of the Commonwealth, Corporations Division
 One Ashburton Place, 17th floor
 Boston, MA 02108-1512
 Telephone: (617) 727-9640

Annual Report

(General Laws, Chapter 156D, Section 16.22; 950 CMR 113.57)

Identification Number: 043518600

1. Exact name of the corporation: FIRST COLONY DEVELOPMENT CO., INC.

2. Jurisdiction of Incorporation: State: MA Country:

3,4. Street address of the corporation registered office in the commonwealth and the name of the registered agent at that office:

Name: BRENDA JOHNSON
 No. and Street: 7 EDA AVENUE
 City or Town: CARVER State: MA Zip: 02330 Country: USA

5. Street address of the corporation's principal office:

No. and Street: 7 EDA AVENUE
 City or Town: CARVER State: MA Zip: 02330 Country: USA

6. Provide the name and addresses of the corporation's board of directors and its president, treasurer, secretary, and if different, its chief executive officer and chief financial officer.

Title	Individual Name First, Middle, Last, Suffix	Address (no PO Box) Address, City or Town, State, Zip Code
PRESIDENT	JON MARK DELLI PRISCOLI	7 EDA AVENUE CARVER, MA 02330 USA
PRESIDENT	JON MARK DELLI PRISCOLI	7 EDA AVENUE CARVER, MA 02330 USA
TREASURER	JON MARK DELLI PRISCOLI	7 EDA AVENUE CARVER, MA 02330 USA
SECRETARY	JON MARK DELLI PRISCOLI	7 EDA AVENUE CARVER, MA 02330 USA
DIRECTOR	JON MARK DELLI PRISCOLI	7 EDA AVENUE CARVER, MA 02330 USA

7. Briefly describe the business of the corporation:

REAL ESTATE, CONSTRUCTION

8. Capital stock of each class and series:

9. Check here if the stock of the corporation is publicly traded:

10. Report is filed for fiscal year ending: 12/31/ 2018

Signed by JON MARK DELLIPRISCOLI, its OTHER OFFICER
on this 2 Day of December, 2018

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All Rights Reserved

Exhibit 2



MACKIE
SHEA_{PC}

COUNSELORS AT LAW

Boston Office 20 Park Plaza, Suite 1118, Boston, MA 02116

Concord Office 33 Bradford Street, Concord, MA 01742

p 617 266 5700 f 617 266 5237 www.lawmso.com

September 27, 2019

VIA ELECTRONIC AND HAND DELIVERY

Mr. Mark D. Marini, Secretary
Department of Public Utilities
Commonwealth of Massachusetts
One South Station, 5th Floor
Boston, MA 02110

Re: Petition of Grafton & Upton Railroad Company, D.P.U. 19-39

Dear Secretary Marini:

Enclosed please find a Supplement to the Hopedale Board of Water and Sewer Commissioners' Motion to Intervene. As noted in the Hopedale Board of Water and Sewer Commissioner's August 30, 2019 Motion to Intervene, the Board was in the process of conducting a updated fracture trace study. Through this filing, the Board is submitting the completed fracture trace study to be considered as part of its Motion to Intervene in this proceeding.

Thank you for your attention to this matter. Please contact me with any questions.

Sincerely,

Peter F. Durning

Enclosure

cc: *(Via Electronic and First Class Mail)*
Edward J. Burt, Board of Water & Sewer Commissioners, Chair
Tim Watson, Town of Hopedale Water & Sewer Department, Manager
Jennifer Cargill, Hearing Officer
Sandra R. Austin, Esq.
James Howard, Esq.

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

D.P.U. 19-39

_____))
PETITION OF GRAFTON & UPTON)
RAILROAD COMPANY FOR AUTHORITY)
TO EXERCISE POWER OF EMINENT)
DOMAIN TO ACQUIRE PROPERTY IN)
HOPEDALE, MASSACHUSETTS)
_____)

**SUPPLEMENT TO THE HOPEDALE BOARD OF WATER AND
SEWER COMMISSIONERS' MOTION TO INTERVENE**

The Hopedale Board of Water and Sewer Commissioners (the "HBWSC") respectfully submits this supplement to its August 30, 2019 Motion to Intervene (the "HBWSC's MTI").

As noted in the HBWSC's MTI, the HBWSC included in its filing a Fracture Trace Analysis performed by the D.L. Maher Co. for the HBWSC in or around 2005. HBWSC's MIT, ¶ 11 and Exhibit D. Unfortunately, due to the passage of time and extenuating circumstances, the figure was the only remaining element from this Fracture Trace Analysis. HBWSC's MIT, ¶ 11.

The HBWSC commissioned a new Fracture Trace Analysis to provide the "Hearing Officer with a more comprehensive analysis of the critical importance of this portion of the Property for the Town of Hopedale's long-term public drinking water needs." HBWSC's MIT, ¶ 12.

The HBWSC retained Geosphere Environmental, LLC ("Geosphere") to perform a new Fracture Trace Analysis. HBWSC's MIT, ¶ 12. With this Supplement, the HBWSC hereby submits Geospheres' Fracture Trace Analysis, a copy of which is attached as **Exhibit 1**.

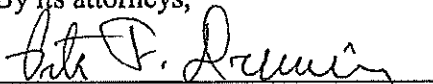
Rail line and west of the Mill River/Hopedale Pond wetland system. These three locations have a strong likelihood for providing a viable public drinking water well.” Exhibit 1.

The HBWSC demonstrated in its Motion to Intervene that Hopedale’s current need for an additional public drinking water supply is acute. HBWSC’s MIT, ¶ 13. The HBWSC intends to pursue the possibility of developing one (or more) of the locations identified by Geosphere as a potential groundwater well.

The HBWSC respectfully requests that the Hearing Office take this supplemental information regarding the potential for a viable drinking water well on Property that is the subject of GURR’s eminent domain action into account in its assessment of the HBWSC’s standing to intervene and with respect to the HBWSC’s request for an award of a taking or, alternatively, an easement for a portion of the Property for the protection of existing water supply areas and the development of future public water supply resources within the Town of Hopedale.

PETITIONER,
HOPEDALE BOARD OF WATER AND SEWER
COMMISSIONERS

By its attorneys,



Peter F. Durning (BBO #658660)

MACKIE SHEA PC

20 Park Plaza, Suite 1118

Boston, MA 02116

(617) 266-5104

pfd@lawmso.com

Dated: 9/27/2015

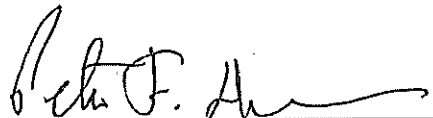
CERTIFICATE OF SERVICE

I, Peter F. Durning, hereby certify that I have served a copy of the foregoing Supplement to the Hopedale Board of Water and Sewer Commissioners' Motion to Intervene, by electronic mail and by first class mail postage prepaid upon counsel on the Department of Public Utilities

Service List:

Sandra Austin, Esq.
24 Bolton Street
Marlborough, MA 01752
Email: sandra@attyaustin.com

James Howard, Esq.
57 Via Buena Vista
Monterey, CA 93940
Email: jim@jehowardlaw.com



Peter F. Durning

Dated: 01/27/2019

Exhibit 1

September 25, 2019

Hopedale Board of Water & Sewer Commissioners
Tim Watson, Manager
Town of Hopedale Water & Sewer Department
78 Hopedale Street, P.O. Box 7
Hopedale, MA 01747

**RE: Fracture Trace Analysis
Hopedale, MA**

Dear Mr. Watson,

The following is a description of the fracture trace analysis (FTA) performed by Geosphere Environmental Management, Inc. (GEOSPHERE) for the Town of Hopedale, MA.

Fracture Trace Analysis

For bedrock groundwater supply exploration, a fracture trace analysis (FTA) is traditionally performed to provide information on the character (i.e. fractures in the rock) of the crystalline bedrock for a selected area. Unlike groundwater flow in sand and gravel aquifers which occurs through the pore spaces of the sand and gravel deposits, groundwater flow in crystalline bedrock occurs along open fractures in the rock. If there are few fractures in the rock, then there are only a few pathways for groundwater to migrate through the bedrock aquifer.

As indicated above, groundwater in crystalline bedrock travels through open fractures in the rock. These fractures vary in width, but are typically less than an inch wide. The fractures can be oriented vertical to or horizontal to the ground surface and can extend for various distances.

FTA is performed using a remote sensing (i.e. use of aerial photographs) method used to identify and map the locations of fracture traces. A fracture trace or photolinear is a line that marks the intersection of a fracture in bedrock with the ground surface. The goal of a FTA is to identify areas on aerial photographs that contain a high concentration of fractures of a significant length that might yield high amounts of groundwater.

Because water is one of the major weathering agents in rock, flow of water along fractures, in general, causes increased weathering and weakening of the bedrock along the fractures. This increased weathering causes geomorphic and soil moisture changes as well as changes in soil color, supporting biological processes, and vegetation. The weathering processes may manifest as straight stream segments, mark abrupt changes in course of a stream, alignment in a vegetation pattern, and alignment of topographic features. To assess these features, part of the FTA evaluation involves the review of existing topographic maps, surficial geology maps, and bedrock geology maps. These maps will aid in identifying photolinear features on the aerial photograph that meet the criteria as a fracture trace.

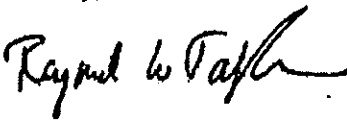
As indicated above, the most favorable location for a high yield bedrock well is at the intersections of multiple photolinears (fracture traces) of a significant length which may indicate a wide catchment area for a viable well.

The results of the FTA for Hopedale are shown on Figures 1 and 2. Two aerial photographs were used to identify the fracture traces. For the purpose of this analysis to identify a viable public drinking water well, the study included fractures that were at least 2,000 feet. As shown on the figures, there are fracture traces identified on either side of the existing Grafton-Upton Rail line. There are three locations where multiple fracture traces of significant length are intersecting in the area to the east of the Grafton-Upton Rail line and west of the Mill River/Hopedale Pond wetland system. These three locations have a strong likelihood for providing a viable public drinking water well. These areas are shown on the figures and designated as potential bedrock drilling locations. Further analysis through drilling would be required to confirm the presence of groundwater resources. The figures also depict a 400-foot radius circle is included around each of these three locations, which represents the sanitary protective area for each well. The Massachusetts Department of Environmental Protection (MA DEP) regulations designate this 400-foot radius area (approximately 12 acres) for activities associated with the operation and maintenance of a groundwater well. All other activities are prohibited from the sanitary protective area.

GEOSPHERE has performed numerous FTA studies in communities neighboring Hopedale. For these projects, we have identified a smaller number of fracture traces than what we identified for Hopedale in this study. We interpret the larger number of identified fracture traces as positive indicators for the favorable potential for high yield bedrock well(s) for the Town of Hopedale. GEOSPHERE recommends moving forward with bedrock exploration drilling at these three identified FTA locations.

If you have any questions, please feel free to contact us.

Sincerely,



Raymond W. Talkington, Ph.D., P.G., C.P.G.
Principal Hydrogeologist



Upton



Milford

Hopedale

Mendon

Legend

- Potential Drilling Locations
- Granton & Upton RR
- Lineaments - Air Photo 28737-6-31
- Lineaments - Air Photo 28737-6-32
- 400-ft. Radius
- Tax Parcels
- Town Boundary
- Wetlands

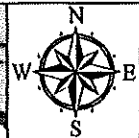
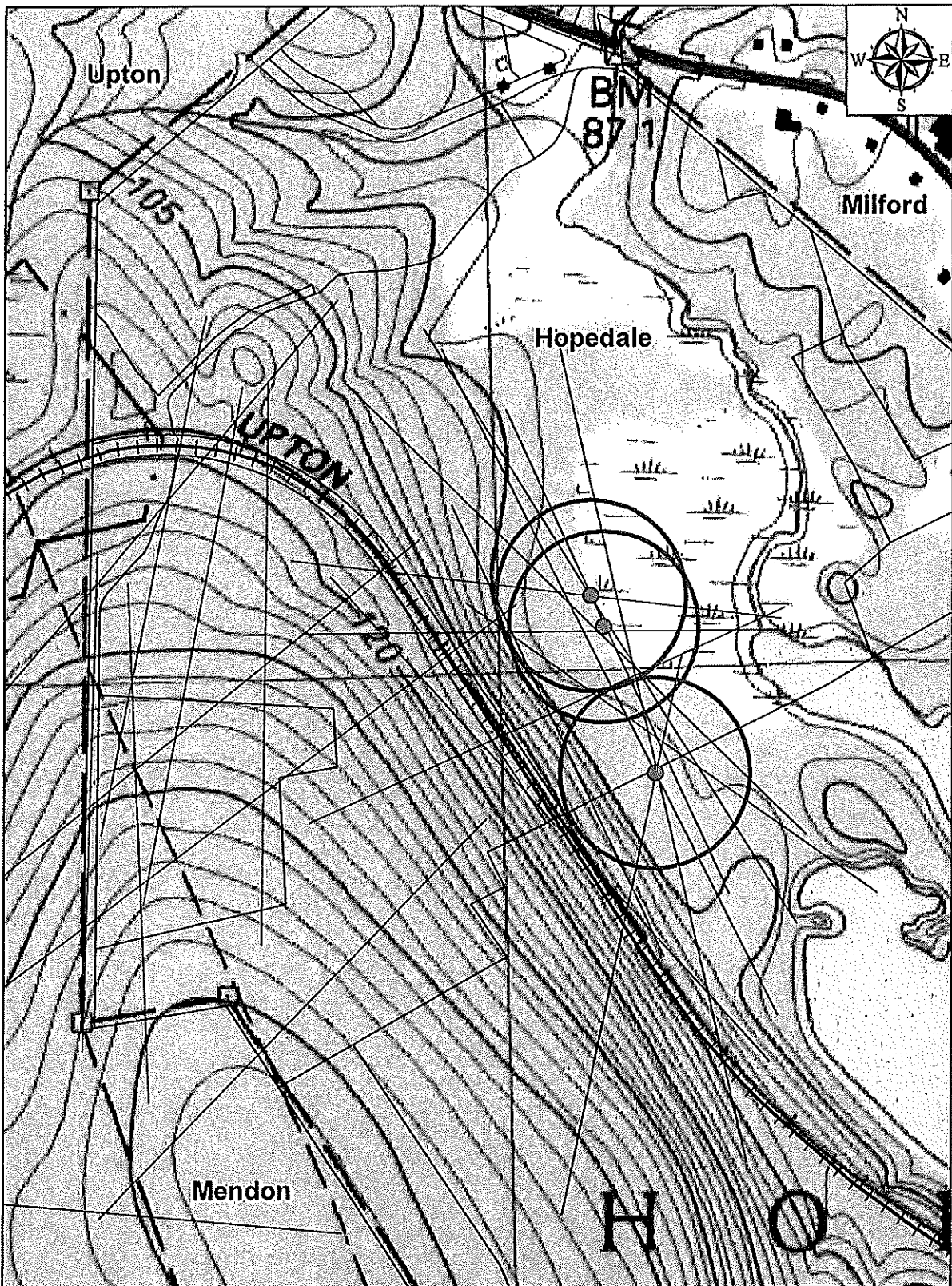


GEOSPHERE
ENVIRONMENTAL MANAGEMENT INC.

FIGURE 1
POTENTIAL DRILLING LOCATIONS
Water and Sewer Department
Town of Hopedale, MA

CREATED BY: Matt Cole 1/1/11	CHECKED BY: Ray Talbot 1/1/11	PROJECT: WWS/1/1/11
------------------------------------	-------------------------------------	------------------------

Data Source: ArcView GIS (Part of Geographic Information)



Legend

- Potential Drilling Locations
- Gratton & Upton RR
- 400-ft. Radius
- Lineaments - Air Photo 28737-5-31
- Lineaments - Air Photo 28737-6-32
- Tax Parcels



GEOSPHERE
ENVIRONMENTAL MANAGEMENT INC.

FIGURE 2
POTENTIAL DRILLING LOCATIONS
(Milford, MA Quadrangle)
Water and Sewer Department
Town of Hopedale, MA

CREATED BY: Bill King 9/16/09	CHECKED BY: Ray Tolpin 9/23/09	PROJECT: 91019/Vign
Data Source: MapGIS (Source of Geographic Information)		

Exhibit 3



**LIMITED DESKTOP SITE
SCREENING REPORT**

Town of Hopedale, MA

October 22, 2020

ENVIRONMENTAL
 **PARTNERS**

CONTENTS

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- 1.1 BACKGROUND 3
- 1.2 DESKTOP STUDY AREA 4
- 2.0 METHODOLOGY 5**
- 3.0 SITE EVALUATION RESULTS 7**
- 4.0 CONCLUSIONS AND RECOMMENDATIONS 11**
- DEFINITIONS 13**

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Figure 6	Chapter 61 Parcel and Town-Owned Parklands Zone I with Hydrology Constraints
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Figure 8	Chapter 61 Parcel with Environmental Concerns and 0.5 Mile Buffer
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Figure 11	Chapter 61 Parcel Potential Single Well and Wellfield Locations

LIST OF APPENDICES

Appendix A	Environmental Data Resources Report
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1.0 INTRODUCTION

The Town of Hopedale is considering purchasing one privately held parcel at the north end of Town known as 364 West Street (Parcel 2-5-0)(herein referred to as the "Chapter 61 Parcel"). The Chapter 61 Parcel is currently owned by the One Hundred Forty Reality Trust and a portion of the parcel is currently managed as forest lands under M.G.L. c. 61 (herein referred to as the Chapter 61 Forest Land). The landowner provided a Notice of Intent to sell 364 West Street to the Town of Hudson on July 9, 2020. Pursuant to M.G.L. c. 61, the Town has the right of first refusal to purchase the chapter 61 Forest Land portion of the Chapter 61 Parcel. Environmental Partners Group, Inc. (EP) on behalf of the Town and Mackie Shea Durning PC (MSD) conducted a limited desktop evaluation of the Chapter 61 Parcel as a potential new public water supply source. Figure 1 is a topographic map showing the location of the Chapter 61 Parcel.

1.1 Background

The 364 West Street parcel is 155.24 acres in area, including 25.06 acres of wetlands that are excluded from the Chapter 61 Forest Land designation (Figure 2). Thus, the Chapter 61 Forest Land covers 130.18 acres. The Town is currently evaluating whether to exercise its right of first refusal for the Chapter 61 Forest Land, and it may seek to include the 25.06 acre "excluded wetland parcel" in the acquisition. For purposes of this desktop evaluation, EP has assumed that this wetland parcel is included in the purchase and can also be utilized for water supply protection purposes.

The Chapter 61 Parcel abuts the northern end of a 279.7 acre parcel owned by the Town of Hopedale Parks Commission (herein referred to as the Town Parcel) and is situated just north of Hopedale Pond (Figure 1). The Mill River runs north to south through the eastern portion of the Chapter 61 Parcel. Wetland Resource Areas (as mapped by Massachusetts Department of Environmental Protection) cover a section of the parcel's eastern portion that contains the Mill River. The Grafton-Upton Railroad (GUR) right-of-way crosses north-south through the Chapter 61 Parcel and the Town Parcel. Additionally, a gas line easement runs through the western edge of both parcels.

There are currently no public water supply wells located on the Town Parcel; however, the Zone II for the Town's public water supply wells extends onto the Town Parcel as shown on Figure 3. The Chapter 61 Parcel and Town Parcel are both located hydraulically upgradient of all of the Town's public water supply sources and these parcels provide an important buffer for protection of the Town's public water supply wells.

The existing public water supply wells in the Town of Hopedale consist of 33 wells within the Mill Street Wellfield, 3 gravel pack wells at Green Street, and 2 bedrock wells at Green Street (Figure 3). The combined permitted capacity of these three sources is 307.67 million gallons per year (MGY) or a combined pumping rate capacity of approximately 582 gallons per minute (gpm). The actual combined current capacity of these three sources is 136.91 MGY or approximately 260 gpm.

The Town has conducted limited desktop and field water supply exploration on both the Chapter 61 Parcel and Town Parcel in the past, but the two test borings did not identify productive well sites (Figure 4) and access to the larger portion of the parcels is a limiting factor. The combined addition of the Chapter 61 Parcel with the Town Parcel will provide a much larger available area for water supply exploration and development.

Based on existing service connections and water demands, the current water supply sources are pumping at full capacity and the Town is limited on any future development without a new or expanded water supply source.

The Town has interconnections with the water distribution system of neighboring communities for emergency service or to help meet high demand periods. A new water supply source would provide the Town with the additional capacity and add redundancy and resilience to the water system.

1.2 Desktop Study Area

As discussed above, the Town is considering acquiring all of 364 West Street for public water supply protection and possible development of a new public water supply source. The Chapter 61 Parcel is a 155.24 acre, undeveloped property consisting primarily of forestland and wetland and abuts the north end of a 279.7 acre undeveloped Town Parcel.

If the Town would like to develop a new public water supply source, then Massachusetts Department of Environmental Protection (MassDEP) Water Supply Regulations 310 CMR 22.21 require that the Town own or control a Zone I protective radius around the well or wellfield. Current and/or future land uses within the Zone I must be limited to those directly related to the provision of public drinking water or have no significant adverse impact on water quality. For public water supplies pumping greater than 100,000 gpd, the Zone I protective radius for a single well is 400 feet and for a wellfield is 250 feet.

The potential area for development of a new source public water supply well was determined by mapping the potential land area where the Town could own a Zone I protective radius. A 400-foot buffer for a single well and 250-foot buffer for a wellfield was mapped around the perimeter of the parcel boundaries and land within those buffers could be used for development of a public water supply well or wellfield, provided suitable aquifer material is present.

Figure 5 shows the 400-foot and 250-foot Zone I buffers on the Town Parcel and Figure 6 shows these buffers with the addition of the Chapter 61 Parcel. As shown, addition of the Chapter 61 land would significantly expand the potential area for public water supply development. Both the Chapter 61 Parcel and Town Parcel and are the focus of this desktop study.

This report presents the results of the potential water supply development desktop screening study. This desktop study evaluates the Chapter 61 Parcel in conjunction with the Town Parcel against a defined set of criteria to assist the Town in determining whether these parcels individually or combined may be suitable for further exploration for a potential public water supply source or as water supply protection for the Town's existing sources.

2.0 METHODOLOGY

The physical characteristics of the Chapter 61 Parcel and Town Parcel were compiled and evaluated based on criteria described in Massachusetts Department of Environmental Protection (MassDEP) guidance for siting new public water supplies (*MassDEP Chapter 4 – Groundwater Supply Development and Source Approval Process – Section 4.3*). The following information was developed:

1. The location of the Chapter 61 Parcel was displayed over a topographic map (Figure 1), Town of Hopedale parcel data (Figure 2), and aerial photograph (Figure 3).
2. A map was prepared showing the 400-foot Zone I areas for a single well and 250-foot Zone I area for a wellfield for both the Chapter 61 Parcel and the Town Parcel. Hydrologic constrains, including a 100-foot wetlands and 150-foot surface water buffer were also mapped (Figures 5 and 6).
3. Mapped USGS Surficial Geology was examined and mapped in relation to potential Zone I areas (Figure 7).
4. The following features within the parcel of study and within a 0.5-mile radius of the parcel were mapped using data from Massachusetts Bureau of Geographic Information (MassGIS), United States Geologic Service (USGS), and Environmental Data Resources (EDR) Record Search, and other readily available public information.
 - Areas of Critical Environmental Concern
 - Priority habitats for rare and endangered species
 - Proximity to surface water bodies (lakes and ponds) and certified vernal pools
 - Wellhead protection areas
 - Private water supplies
 - NPDES permit sites
 - Hazardous waste (21E) sites, as listed in the Department of Environmental Protection data base
 - Stocked trout streams and cold water fisheries
 - Automobile graveyards and junkyards
 - Petroleum and oil bulk stations and terminals
 - Agricultural uses
 - Proximity to industrial parks
 - Parcels with conservation restrictions
 - Proximity to landfill disposal sites
 - Proximity to wastewater treatment and effluent disposal facilities
 - Municipal Zoning

This information is shown in Figures 8 and 9.

5. A map was prepared showing land uses within the 0.5-mile radius of each site. Land uses within the Zone I of the well site that are not consistent with MassDEP regulations, or land uses within a 0.5 mile radius that could potentially impact water quality (i.e., industrial properties, multifamily residential properties with onsite septic, etc.) were identified. The land uses are shown on Figure 9.

6. The Sustainable Water Management Initiatives (SWMI) Basins were evaluated and mapped to determine the percent groundwater depletion, to determine if the basin is potentially suitable for permitting a new groundwater public water supply source (Figure 10).
7. The Chapter 61 Parcel was also mapped in relation to existing water supply protection areas, being existing Zone IIs (Figure 3).
8. A review was performed of MassDEP's Waste Site and Reportable Releases Database for oil and/or hazardous materials releases on or near the parcel of study.
9. An EDR report was reviewed to inventory underground storage tanks, Superfund, Brownfield, RCRA, and NPDES-permitted sites within 0.5 miles from the parcel of study, as well as environmental records for various other nearby sites that could generate hazardous waste (included in Appendix A).
10. A review of a previous fracture trace analysis (FTA) and exploratory borings was performed and results compared with finding from this study (Figure 4).

It should be noted that this desktop screening evaluation is based solely on database searches of readily available public information. Prior to property acquisition or initiating additional water supply development activities at the potential site, the results of this desktop evaluation should be assessed further and/or verified in the field.

3.0 SITE EVALUATION RESULTS

The information collected for the Chapter 61 Parcel and Town Parcel combined are described below and include the criteria discussed in Section 2.

Land Ownership

The Land Ownership criteria evaluates what land is available for groundwater supply exploration, and is based on ownership and control of the MassDEP required Zone I area.

- The parcel of study, the Chapter 16 Parcel, is owned by the One Hundred Forty Realty Trust and is currently partially managed as forest lands under Chapter 61. The Town has the right of first refusal to acquire the forestry lands subject to M.G.L. c. 61.
- Figure 6 shows the land area within the Chapter 61 Parcel where the Town could site a public water supply well. As shown, the potential area for exploration could extend southward onto existing Town Parcel and combined there is significantly larger, than either the Town Parcel or Chapter 61 Parcel individually.
- As shown on Figure 5, there is sufficient area on the Town Parcel to the south to locate a public water supply well or wellfield. However, should someone else acquire the Chapter 61 Parcel and the property developed use is not consistent with public water supply protection or Zone II land uses, then portions of the Town Parcel may no longer be suitable for public water supply development.
- The parcel of study includes 25.06 acres of wetland resource areas that are excluded from the Chapter 61 Forest Lands designation. If the Town acquires the Chapter 61 land, but does not acquire the excluded wetlands portion of the parcel, the potential land area to site a water supply well within this parcel is significantly reduced. The development potential of the wetland resource area was not evaluated as part of this study.

Hydrogeology

The MassGIS database for public water supply wells, water supply protection areas, and aquifers was reviewed to determine if existing water supply information indicate the area may be suitable for development of a new source water supply. The MassGIS layers indicate that the Chapter 61 Parcel is:

- Not within a MassGIS mapped high or medium yield aquifer.
- Not within a Wellhead Protection Area.
- Located approximately 4,000 feet from the northernmost edge of a previously permitted Zone II aquifer protection area for the Hopedale Public Water Supply Wells.

Surficial Geology (from MassGIS Surficial Geology Data)

Figure 7 shows the USGS mapped surficial geology in the vicinity of the Chapter 61 Parcel and the Town Parcel. The surficial geology is reviewed to determine if there is mapped potential aquifer material for development of an overburden water supply source. Surficial geology does not preclude the potential development of a bedrock water supply source.

- The Chapter 61 Parcel geology consists of coarse glacial stratified deposits, swamp deposits, thin till, and thick till. The Town Parcel contains the same surficial geology deposits. Glacial till and swamp deposits are not typically suitable material for water supply development. The areas mapped as coarse glacial stratified deposits could potentially provide suitable aquifer material for development of an overburden public water supply. Subsurface exploration would be required to determine if there is potential aquifer material at potential sites.
- The coarse glacial stratified deposits (potential aquifer material) are located within the Mill River valley and the surrounding area is mapped as thin and thick till. The Town's current overburden water supply sources are located within the Mill River valley coarse glacial stratified deposits.
- As shown on Figure 7, the Town Parcel has limited areas of surficial geology potentially suitable for water supply development. Purchasing the Chapter 61 Parcel provides a much larger area with potentially suitable surficial geology for exploration.

Sensitive Receptors (Within 0.5 miles of parcel)

Figure 8 is a map showing potential environment concerns within the vicinity of the Chapter 61 Parcel and the Town Parcel. This map shows potential environmental receptors that should be evaluated to determine if development of a public water supply well could have an adverse impact to the receptor.

- Areas of Critical Environmental Concern (ACEC) – No ACEC within 0.5 miles of the subject parcel.
- Priority Habitats – No Natural Heritage and Endangered Species Program (NHESP) Priority Habitats of Rare Species and NHESP Estimated Habitats of Rare Wetland Species mapped within 0.5 miles of the subject parcel.
- Vernal Pools – Two potential vernal pools are within 0.5 miles of the subject parcel.
- Lakes and Ponds – Mill Pond and Hopedale Pond are both within 0.5 miles of the subject parcel. Hopedale Pond extends into the southeastern corner of the parcel itself and Mill Pond is within 250 feet of the parcel. Mill Pond has been identified as a Category 5 water body on the 2016 Integrated List of Waters, meaning its impairments require a Total Daily Maximum Load (TMDL) for related to the impairments from non-native aquatic plants, macrophytes, PCB in fish tissue, and other unidentified impairment(s). Potential impacts from a public water supply source to these surface water features would need to be evaluated further.
- Protected Open Space – To the south, the subject parcel abuts Town-owned parkland, a protected open space. The Town has noted that the protected open space restrictions on the Town Parcel can be modified to allow development of a public water supply well. To the west, the subject parcel abuts DCR protected open space. Additionally, Town of Milford-owned and privately owned protected open spaces are located within 0.5 miles of the parcel, to the north and northeast.
- Stocked Trout Streams and Cold Water Fisheries – There are none within 0.5 miles of the subject parcel.

Potential Threats (Within 0.5 miles of parcel)

Figure 7 shows potential areas or sites of concern that could adversely impact water quality at the Chapter 61 Parcel or the Town Parcel. Figure 8 is a map showing land uses on these parcels or in the surrounding area.

- NPDES Permit/Discharge Sites – None within 0.5 miles of the subject parcel.
- 21E Release Sites – A parcel 2,000 feet away from the Chapter 61 Parcel is listed as having had a 17-gallon transmission oil spill. A permanent solution (Class A2 Response Action Outcome) was submitted in 1996, indicating that a condition of No Signification Risk has been achieved, but the contamination was not reduced to background.
- Automobile Graveyards and Bulk Oil Stations – None within 0.5 miles of the subject parcel.
- Active or Inactive Landfills – None within 0.5 miles of the subject parcel. The nearest landfill is the Draper Landfill, 4,100 feet south of the subject parcel. The Draper Landfill (a closed landfill) is listed as a Massachusetts state hazardous waste site with chlorinated solvents detected in surface water and groundwater. Although the Draper Landfill is located greater than ½ mile from the Chapter 61 Parcel, the landfill abuts the Town Parcel to the west and southwest and based on proximity could potentially adversely impact water quality on the Town Parcel. The Chapter 61 Parcel would be more advantageous.
- Wastewater Treatment Facility – None within 0.5 miles of the subject parcel.
- Other Non-Open Land Uses Present
 - Industrial land, including a nursing home, a removal and salvage company, and a landscaping supply store.
 - Commercial land, including auto repair shops, car dealerships, and a storage company.
 - Residential land.

Fracture Trace Analysis and Previous Borings Findings

Figure 4 summarizes existing borings that have been drilled on the Chapter 61 Parcel or the Town Parcel or within Town, as well as areas previously recommended for water supply exploratory drilling.

- The Town of Hopedale has previously conducted a bedrock exploratory boring in 2008. The test well was located in the southern portion of the Town Parcel and drilled to 600 feet below ground surface. This well did not produce any viable amount of water.
- Shallow test wells were drilled across town over the past 30 years. In 1988, the Town conducted an exploratory boring in the south of the Town. In the 1990s, additional test wells were drilled in the Chapter 61 Parcel, to the east of the Mill River; the drilling location was selected based on ease of access. Test wells were drilled in 2019 in the center of Town. All these test wells found material too fine to be suitable aquifer material.
- The results of the exploratory borings completed since 1988 indicate that potential water supply sources within the Town may be limited.

- A Fracture Trance Analysis (FTA) was completed in September 2019 and identified three locations on the Chapter 61 Parcel that contain a high concentration of photolinears (fracture traces) in the bedrock of a significant length. Two of the locations identified are within 100 feet of wetlands. The proximity to wetlands does not preclude water supply well development; however, additional steps need to be taken, including approval from the Hopedale Conservation Commission and MassDEP. The third potential bedrock well location is on the boundary between the Chapter 61 Parcel and the Town Parcel.

Sustainable Water Management Initiatives (SWMI) Basins

SWMI Groundwater Withdrawal maps show the level of groundwater depletion within a drainage basin to determine the extent of impact from groundwater withdrawal sources. SWMI Basin Groundwater Withdrawal categories are ranked from 1 to 5 with Category 5 having the highest level of groundwater depletion.

- As shown on Figure 10, the Chapter 61 Parcel and Town Parcel are located within a SWMI Basin that is Category 4: 25 to <55% depleted. Based on a Category 4, the basin has some depletion, but the MassDEP could consider permitting a new public water supply source.

New Source Capacity Estimation

A rough estimation of potential well capacity was performed based on the following steps.

- The area of aquifer material present up-gradient of the Chapter 61 Parcel that approximates the Zone II area was estimated to be 16 million square feet (367 acres).
- Average annual rainfall in the Hopedale area is 45 inches per year. USGS estimates of recharge to the aquifer in Massachusetts is approximately 24 inches annually.
- Assuming two feet of recharge per year, the total recharge to the aquifer would be 650,000 gallons per day.
- Assuming that the whole area mapped by USGS as coarse sand deposits is a potentially productive aquifer and that a well could effectively produce 40 percent of the available water in the aquifer, a well could produce up to 260,000 gallons per day. This well capacity is within the range of the permitted capacity of the existing water supply sources in the Town of Hopedale.

4.0 CONCLUSIONS AND RECOMMENDATIONS

EP performed a limited evaluation of the Chapter 61 Parcel as the site for a potential new public water supply source. The goals of the evaluation were to provide the Town with a preliminary assessment of water supply viability, identify potential site constraints, and evaluate related factors concerning suitability of the subject parcels. The objective of the evaluation was to develop recommendations as to whether the Chapter 61 Parcel should be considered further for public water supply exploration or if identified site constraints may preclude development of a new public water supply source. In addition, the Chapter 61 Parcel was evaluated to determine if the Town should consider ownership of the parcel for protection of their existing public water supply sources.

The desktop study also included the adjacent Town Parcel to the south, because if combined the two parcels could provide a significantly larger area for potential water supply exploration and reduce potential site constraints associated with property boundaries. Following is a summary of the key conclusions of the limited desktop study.

1. Limited areas for public water supply exploration are identified on the Town Parcel. The Chapter 61 Parcel significantly increases the potential area for public water supply exploration.

Figure 11 shows the potential area identified for potential water supply exploration. This mapped area only includes:

- Land where the Town could own and control a 250-foot or 400-foot Zone I protective radius;
- Land outside the 100-foot wetlands and 150-foot surface water buffers; and,
- Land with mapped potential aquifer material.

The parcel of study, the Chapter 61 Parcel, is located in the northern section of the Town of Hopedale. The optimal location for siting a new water supply source within this parcel is just west of the wetlands buffer in the eastern portion of this parcel. The potential well site location is on undeveloped forested and non-forested land.

As shown on Figure 11, the Town currently owns approximately 1.67 acres of land within the northern portion of the Town Parcel that could be suitable for a single well source and approximately 2.82 acres for a wellfield. If the Town acquires the Chapter 61 Parcel, then combined the suitable land within this area is increased to approximately 16.72 acres for a single well and approximately 21.09 acres for a wellfield.

2. Potential sensitive environmental receptors are identified within a ½-mile radius that would need to be evaluated further.

Mill Pond and Hopedale Pond are both within 0.5 miles of the Chapter 61 Parcel. Hopedale Pond extends into the southeastern corner of the parcel itself and Mill Pond is within 250 feet of the parcel. Hopedale Pond is located within the Town Parcel. In addition, two potential vernal pools are located within a ½-mile radius of the Chapter 61 Parcel. Potential water supply pumping impacts to these surface water features would need to be evaluated further.

3. No obvious potential areas of concern are identified that would preclude development of a public water supply source on the Chapter 61 Parcel with the exception of the existing Grafton-

Upton railway. Further expansion of the railway operations on the parcel could lead to additional site constraints on both the Chapter 61 Parcel and the Town Parcel.

The Draper Landfill is a closed landfill and is located over ½ mile to the south and downgradient of the Chapter 61 parcel, and as such is not anticipated to impact water quality. However, the Draper Landfill abuts the Town Parcel and could be a potential source of contamination to groundwater near the central or south portions of the Town Parcel.

4. Potential bedrock water supply locations identified are on or require portions of the Chapter 61 Parcel for the MassDEP required Zone I.

The Town had a fracture trace analysis conducted in September 2019 to identify potential areas for bedrock groundwater exploration. Three potential locations were identified, of which two are located on the Chapter 61 Parcel and one location is located along the parcel boundary, which would require ownership or control of part of the Chapter 61 Parcel for a 400-foot Zone I.

5. The Chapter 61 Parcel provides additional protection for the Town's existing public water supply sources.

The Chapter 61 Parcel is located within the Mill River valley, upstream and upgradient of the Town's three existing public water supply sources. Ownership or control of this parcel would provide additional water quality protection. In addition, ownership of the Chapter 61 Parcel would ensure that future land uses on the parcel are consistent with water supply protection and would not adversely impact groundwater quality.

Based on the preliminary desktop study the Chapter 61 Parcel should be considered for further groundwater supply exploration and to provide additional water quality protection for the Town's three existing public water supply sources.

DEFINITIONS

NHESP Priority Habitats of Rare Species – The Priority Habitats of Rare Species data layer contains polygons representing the geographic extent of Habitat of state-listed rare species in Massachusetts based on observations documented within the last 25 years in the database of the Natural Heritage & Endangered Species Program (NHESP). Priority Habitat polygons are the filing trigger for project proponents, municipalities, and all others for determining whether or not a proposed project or activity must be reviewed by the NHESP for compliance with the (MESA) and its implementing regulations. Areas delineated as Priority Habitats can include wetlands, uplands, and marine habitats.

NHESP Estimated Habitats of Rare Wetland Wildlife – The Estimated Habitats of Rare Wildlife data layer contains polygons that are a subset of the Priority Habitats of Rare Species. They are based on occurrences of rare wetland wildlife observed within the last 25 years and documented in the NHESP database. They do not include those areas delineated as Priority Habitat for rare plants or for rare wildlife with strictly upland habitat requirements.

Zone I – Zone I means the protective radius required around a public water supply well or wellfield. For Public Water System wells with approved yields of 100,000 gallons per day (gpd) or greater, the protective radius is 400 feet. Wellfields and infiltration galleries with approved yields of 10,000 gpd or greater require a 250-foot protective radius. Protective radii for all other Public Water System wells, wellfields, and infiltration galleries are determined by the following equation: Zone I radius in feet = $(150 \times \log \text{ of pumping rate in gpd}) - 350$.

Zone II – Zone II means that area of an aquifer that contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at approved yield, with no recharge from precipitation). It is bounded by the groundwater divides that result from pumping the well and by the contact of the aquifer with less permeable materials such as till or bedrock. In some cases, streams or lakes may act as recharge boundaries. In all cases, Zone II shall extend upgradient to its point of intersection with prevailing hydrogeologic boundaries (a groundwater flow divide, a contact with till or bedrock, or a recharge boundary). The Zone II must include the entire Zone I area.

FIGURES

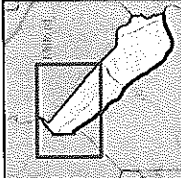
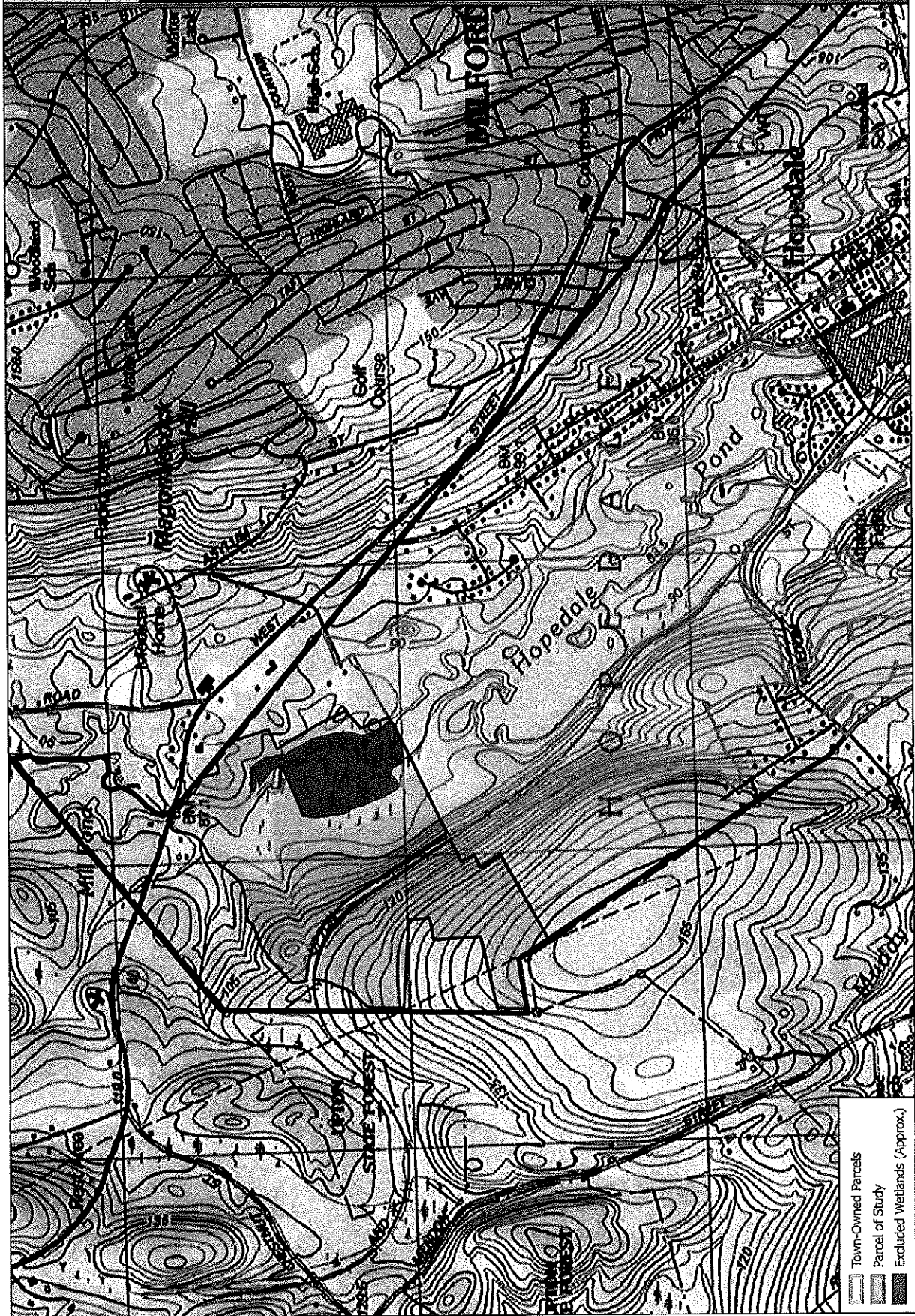


Figure 1: Chapter 61 Parcel and Town-Owned Parklands Topographic Map
Hopedale, Massachusetts

0 500 1,000 Feet

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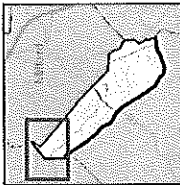
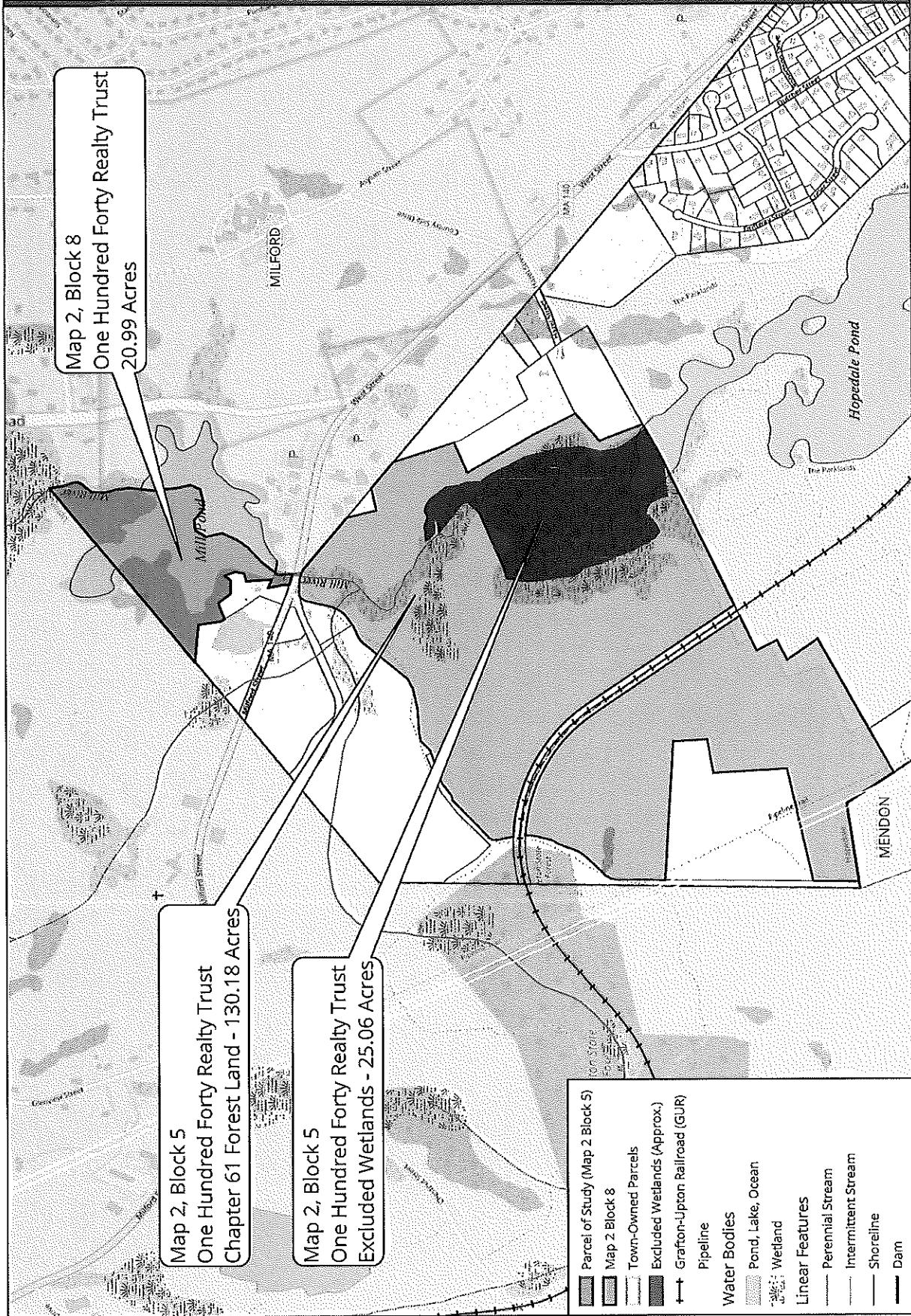


Figure 2: Chapter 61 Parcel (Map 2 Block 5) and Map 2 Block 8 Site Map
 Hopkinton, Massachusetts

0 250 500 Feet

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Map 2, Block 8
 One Hundred Forty Realty Trust
 20.99 Acres

Map 2, Block 5
 One Hundred Forty Realty Trust
 Chapter 61 Forest Land - 130.18 Acres

Map 2, Block 5
 One Hundred Forty Realty Trust
 Excluded Wetlands - 25.06 Acres

Parcel of Study (Map 2 Block 5)

Map 2 Block 8

Town-Owned Parcels

Excluded Wetlands (Approx.)

Grafton-Upton Railroad (GUR)

Pipeline

Water Bodies

Pond, Lake, Ocean

Wetland

Linear Features

Perennial Stream

Intermittent Stream

Shoreline

Dam

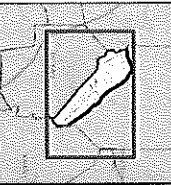


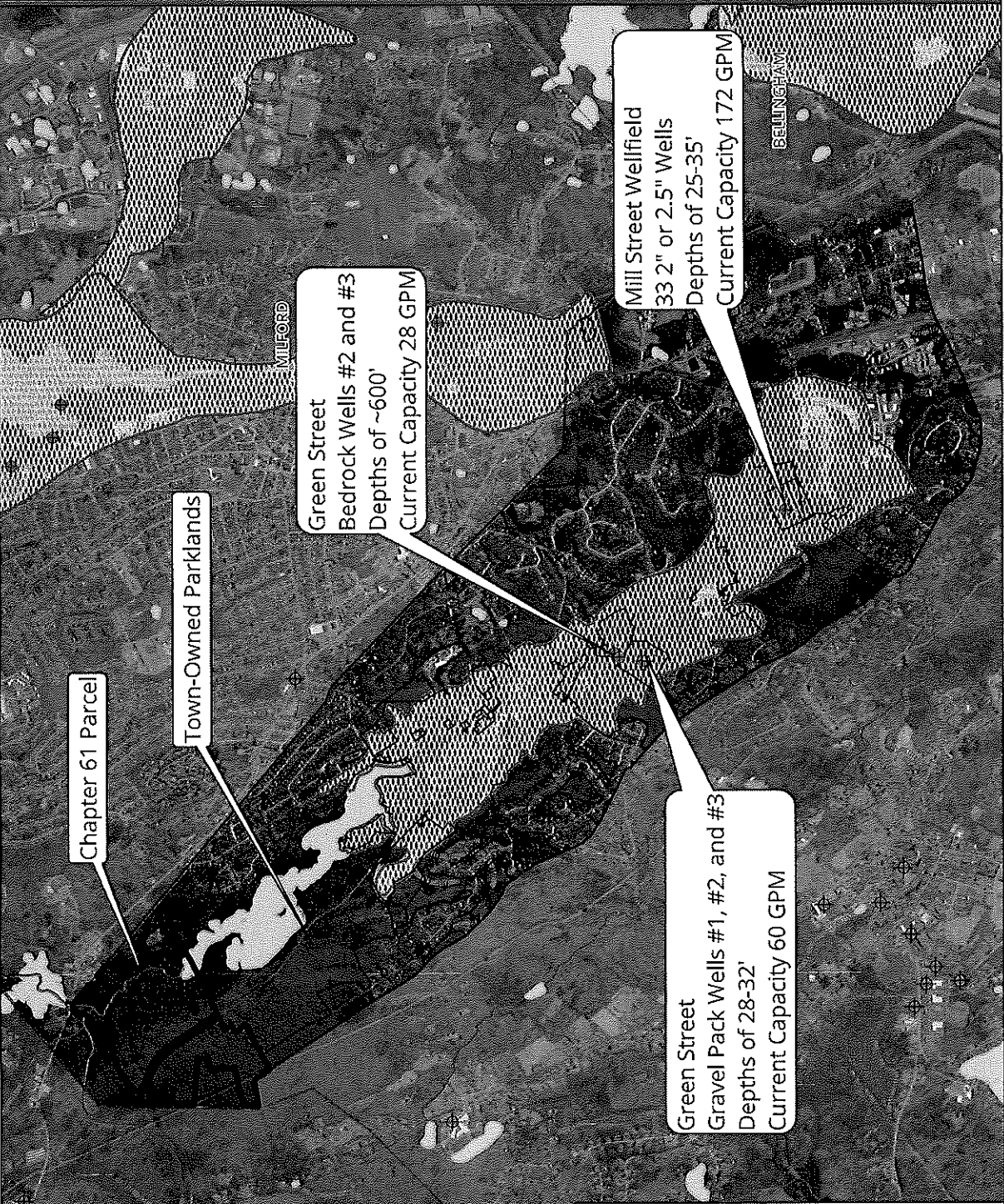
Figure 3: Town of Hopdale Existing Public Water Supply Sources
Hopdale, Massachusetts

0 1,000 2,000 Feet

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Chapter 61 Parcel

Town-Owned Parklands

Green Street
Bedrock Wells #2 and #3
Depths of ~600'
Current Capacity 28 GPM

Mill Street Wellfield
33 2" or 2.5" Wells
Depths of 25-35'
Current Capacity 172 GPM

Green Street
Gravel Pack Wells #1, #2, and #3
Depths of 28-32'
Current Capacity 60 GPM

	Parcel of Study
	Town-Owned Parcels
	DEP Public Water Supply Well
	DEP Approved Zone II
	Water Bodies
	Pond, Lake, Ocean
	Reservoir
	Wetland
	Inundated Area
	Linear Features
	Perennial Stream
	Intermittent Stream
	Shoreline
	Intermittent Shoreline
	Manmade Shoreline
	Dam

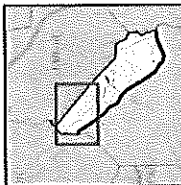
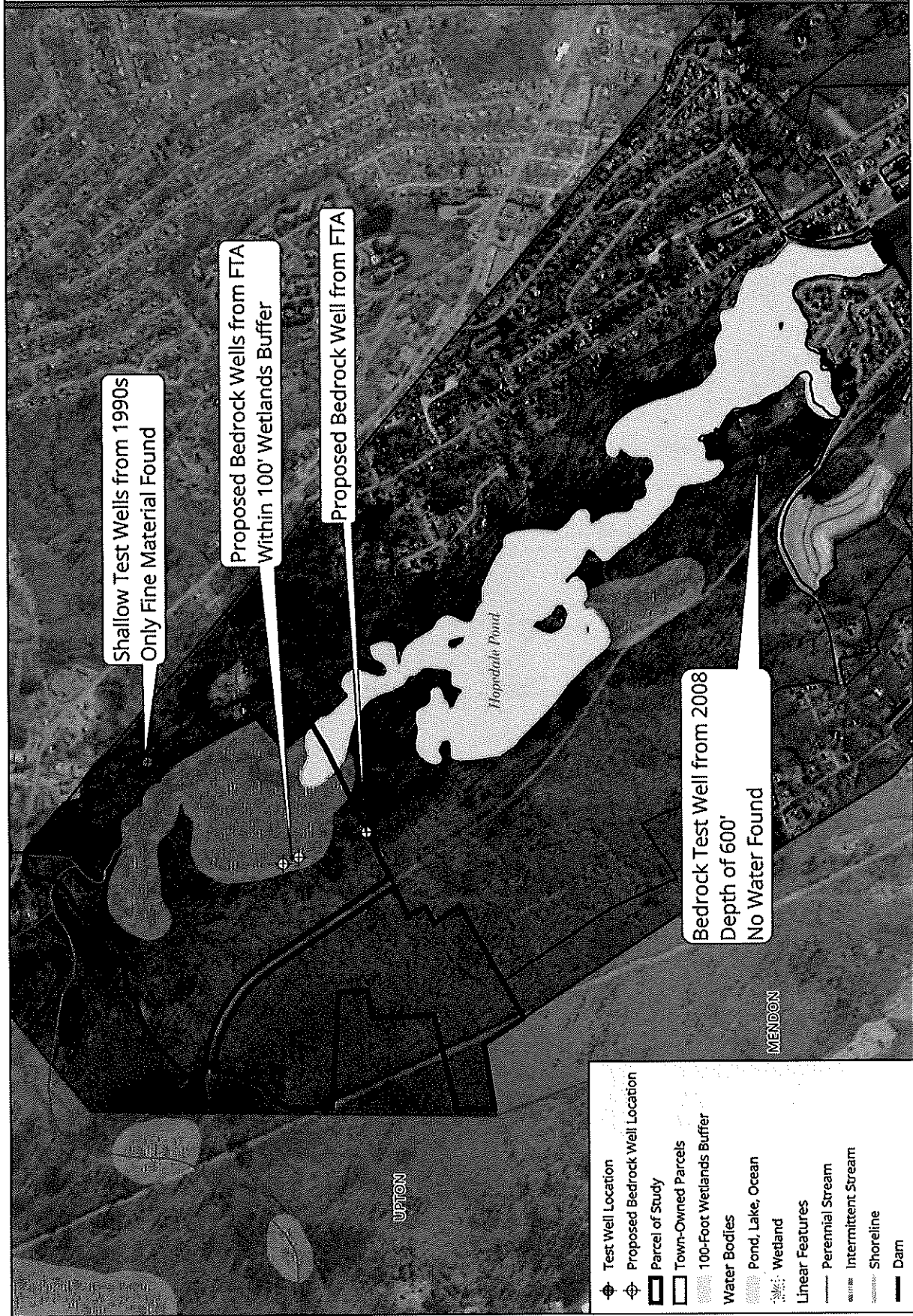


Figure 4: Town of Hopedale Previous Proposed and Test Well Locations
Hopedale, Massachusetts

ENVIRONMENTAL PARTNERS



	Test Well Location
	Proposed Bedrock Well Location
	Parcel of Study
	Town-Owned Parcels
	100-Foot Wetlands Buffer
Water Bodies	
	Pond, Lake, Ocean
	Wetland
Linear Features	
	Perennial Stream
	Intermittent Stream
	Shoreline
	Dam

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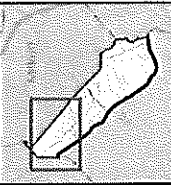
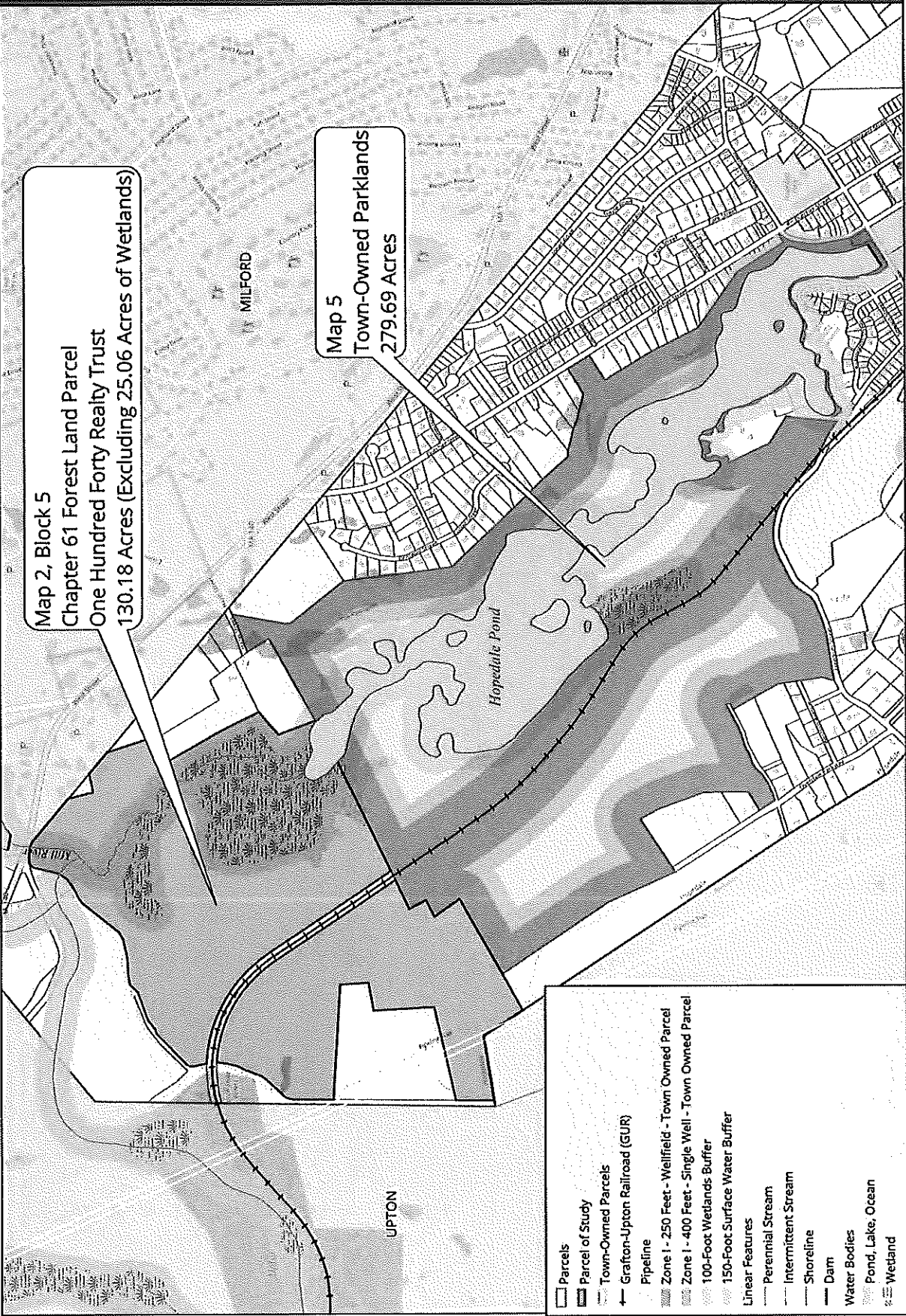


Figure 5: Chapter 61 Parcel and Town-Owned Parklands Site Map
 Hopkinton, Massachusetts

0 300 600 Feet

ENVIRONMENTAL PARTNERS

Date prepared: 02/1/2020-5/04



Map 2, Block 5
 Chapter 61 Forest Land Parcel
 One Hundred Forty Realty Trust
 130.18 Acres (Excluding 25.06 Acres of Wetlands)

Map 5
 Town-Owned Parklands
 279.69 Acres

- Parcels
- Parcel of Study
- Town-Owned Parcels
- Grafton-Upton Railroad (GUR)
- Pipeline
- Zone 1 - 250 Feet - Wellfield - Town Owned Parcel
- Zone 1 - 400 Feet - Single Well - Town Owned Parcel
- 100-Foot Wetlands Buffer
- 150-Foot Surface Water Buffer
- Linear Features
- Perennial Stream
- Intermittent Stream
- Shoreline
- Dam
- Water Bodies
- Pond, Lake, Ocean
- Wetland

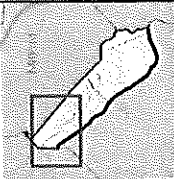


Figure 6: Chapter 61 Parcel and Town-Owned Parklands Zone I with Hydrology Constraints
Highgate, Massachusetts

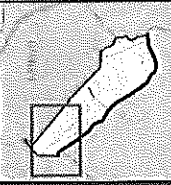


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- Parcel of Study
- Town-Owned Parcels
- Grafton-Upton Railroad (GUR)
- Pipeline
- Zone I - 250 Feet - Wellfield - Parcel of Study
- Zone I - 400 Feet - Single Well - Parcel of Study
- Zone I - 250 Feet - Wellfield - Town Owned Parcel
- Zone I - 400 Feet - Single Well - Town Owned Parcel
- 150-Foot Surface Water Buffer
- 100-Foot Wetlands Buffer
- Water Bodies
- Pond, Lake, Ocean
- Wetland
- Linear Features
- Perennial Stream
- Intermittent Stream
- Shoreline
- Dam



	Parcel of Study
	Town-Owned Parcels
	Grafton-Upton Railroad (GUR)
	Pipeline
	Zone I - 400 Feet - Single Well - Town Owned Parcel
	Zone I - 400 Feet - Single Well - Parcel of Study
	Zone I - 250 Feet - Wellfield - Town Owned Parcel
	Zone I - 250 Feet - Wellfield - Parcel of Study
	100-Foot Wetlands Buffer
	150-Foot Surface Water Buffer
Surficial Geology	
	Shallow Bedrock
	Abundant Outcrop and Shallow Bedrock
	Glacial Stratified Deposits
	Coarse
	Artificial Fill
	Postglacial Deposits
	Swamp Deposits
	Early Postglacial Deposits
	Marine Regressive
	Inland Dune
	Till Bedrock
	Thick Till
	Bedrock Outcrop
	Thin Till
Water Bodies	
	Pond, Lake, Ocean
	Wetland
Linear Features	
	Perennial Stream
	Intermittent Stream
	Shoreline
	Dam

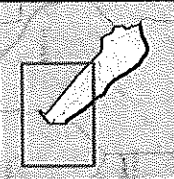


Figure 8: Chapter 61 Parcel with Environmental Concerns and 0.5 Mile Buffer
 Hopkinton, Massachusetts



0 500 1,000 FEET

ENVIRONMENTAL PARTNERS

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- Parcel of Study
- Town-Owned parcels
- Half Mile Radius Around Parcel of Study
- Gratton-Upton Railroad (GUR)
- Pipeline
- DEP Public Water Supply Well
- DEP Approved Zone II
- Non-Community Groundwater Source
- EPA/RCRA-regulated Hazard. Waste
- Inactive Landfill
- AUL Sites
- Certified Vernal Pools
- Potential Vernal Pools
- Protected Open Space
- DCR State Parks & Recreation
- Municipal
- Public Non-Profit
- Non-Profit
- Private
- Linear Features
- Perennial Stream
- Intermittent Stream
- Shoreline
- Intermittent Shoreline
- Dam
- Water Bodies
- Pond, Lake, Ocean
- Wetland
- Inundated Area

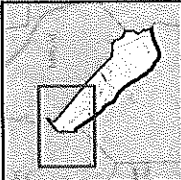


Figure 9: Chapter 61 Parcel with Land Uses and 0.5 Mile Buffer

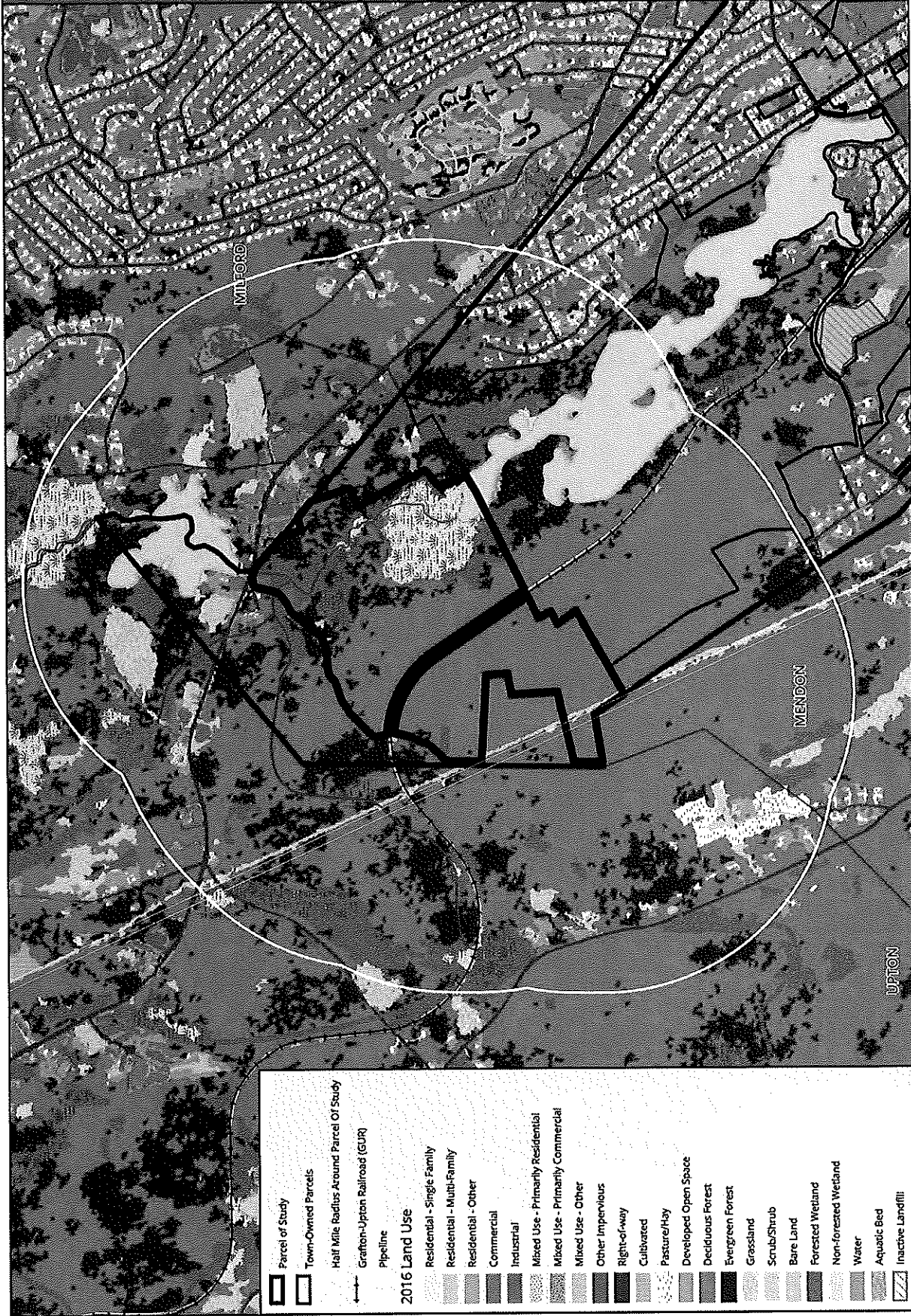
Hopedale, Massachusetts



0 500 1,000 Feet

ENVIRONMENTAL PARTNERS

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	Parcel of Study
	Town-Owned Parcels
	Half Mile Radius Around Parcel Of Study
	Graton-Upton Railroad (GUR)
	Pipeline
2016 Land Use	
	Residential - Single Family
	Residential - Multi-Family
	Residential - Other
	Commercial
	Industrial
	Mixed Use - Primarily Residential
	Mixed Use - Primarily Commercial
	Mixed Use - Other
	Other Impervious
	Right-of-way
	Cultivated
	Pasture/Hay
	Developed Open Space
	Deciduous Forest
	Evergreen Forest
	Grassland
	Scrub/Shrub
	Bare Land
	Forested Wetland
	Non-forested Wetland
	Water
	Aquatic Bed
	Inactive Landfill

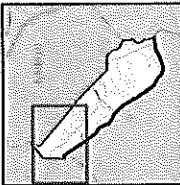


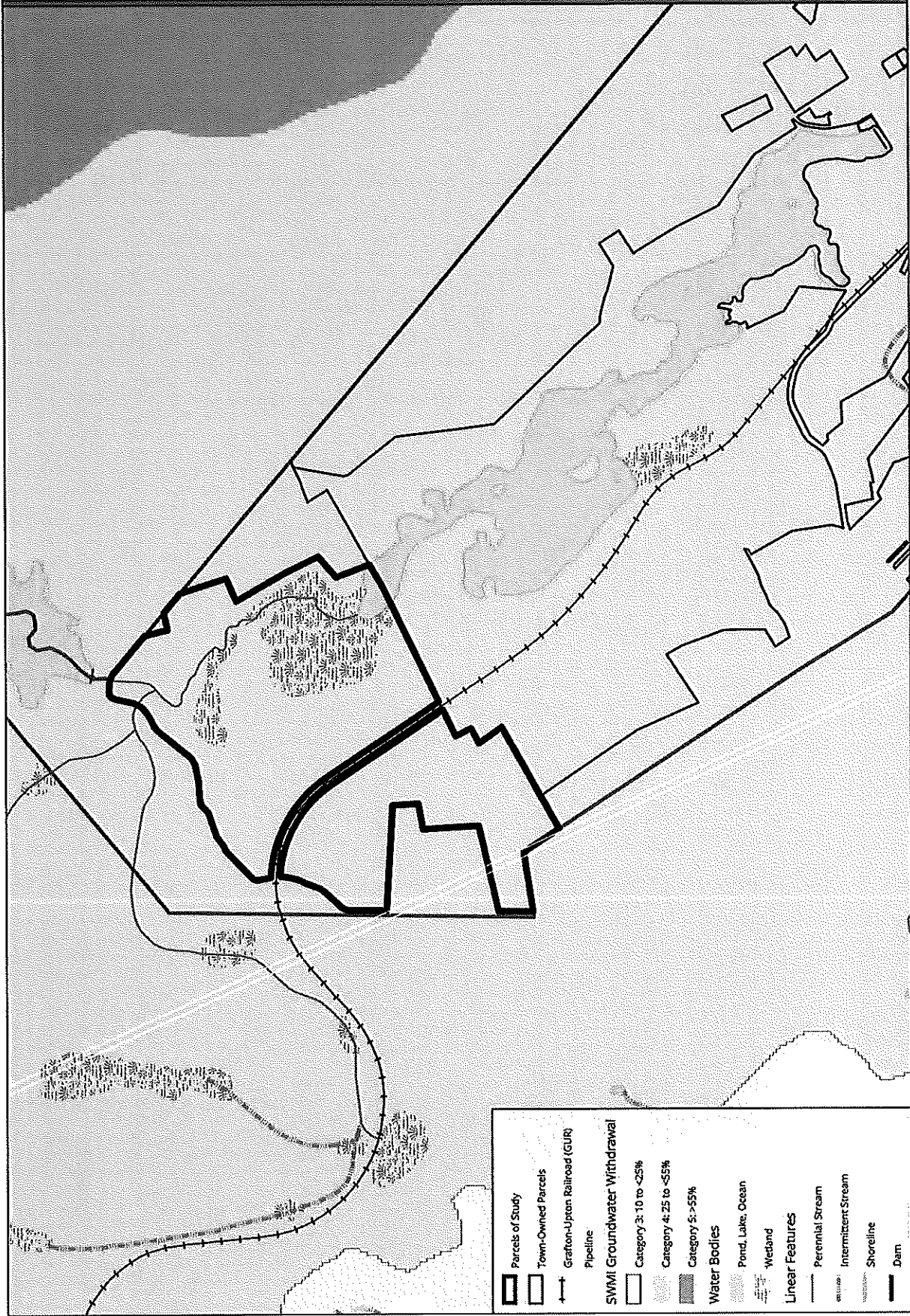
Figure 10: Chapter 61 Parcel and Town-Owned Parklands
With SWMI Basins
Hopedale, Massachusetts



0 300 600 Feet

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	Parcels of Study
	Town-Owned Parcels
	Grafton-Upton Railroad (GUR)
	Pipeline
SWMI Groundwater Withdrawal	
	Category 3: 10 to <25%
	Category 4: 25 to <55%
	Category 5: >55%
Water Bodies	
	Pond, Lake, Ocean
	Wetland
Linear Features	
	Perennial Stream
	Intermittent Stream
	Shoreline
	Dam

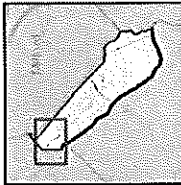


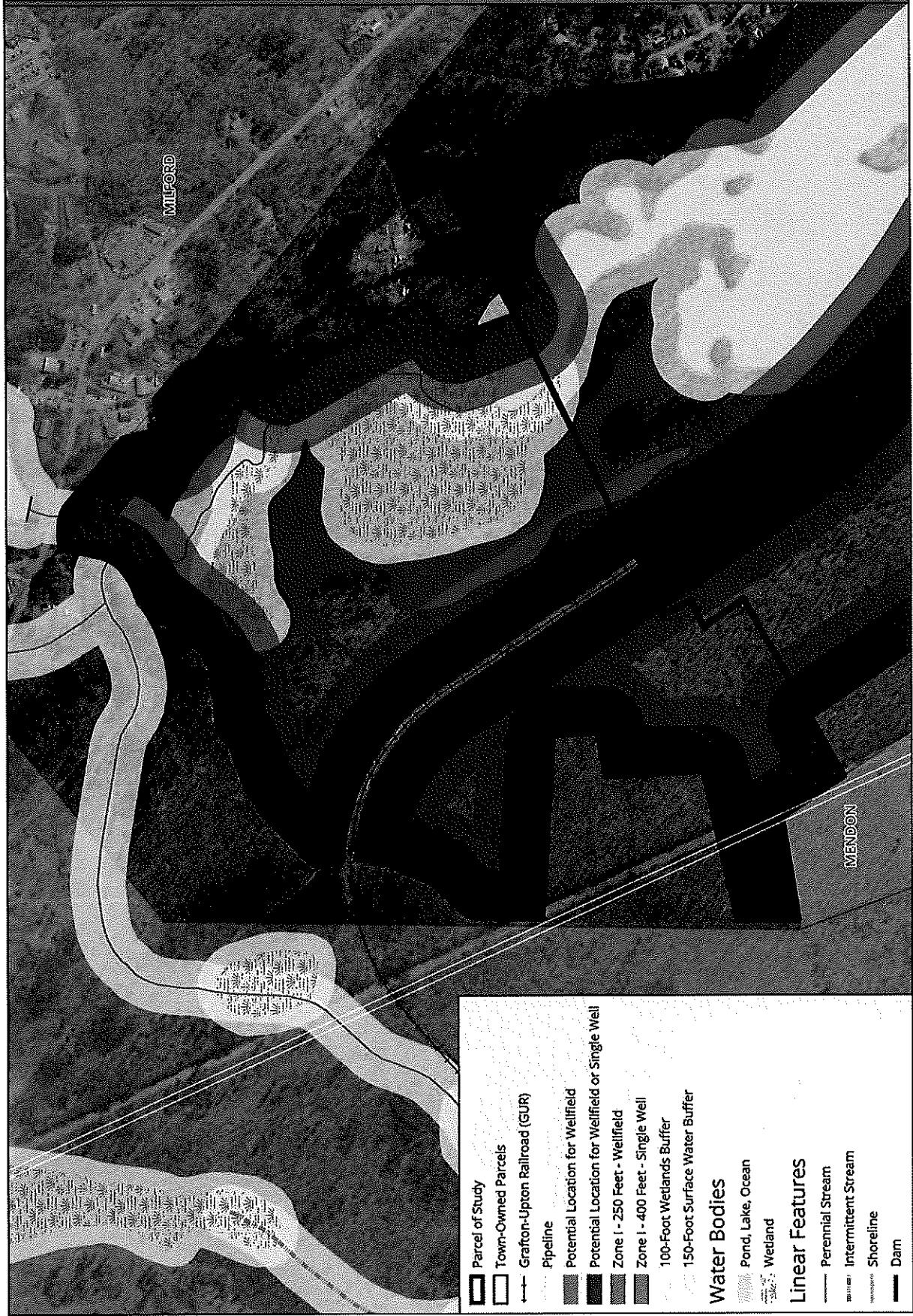
Figure 11: Chapter 61 Parcel Potential Single Well and Wellfield Locations
 Ipswich, Massachusetts



0 250 500 Feet

ENVIRONMENTAL PARTNERS

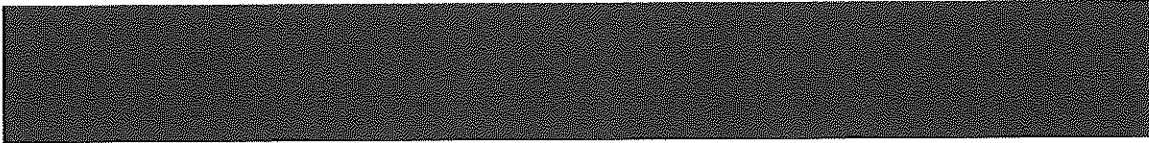
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	Parcel of Study
	Town-Owned Parcels
	Grafton-Upton Railroad (GUR)
	Pipeline
	Potential Location for Wellfield
	Potential Location for Wellfield or Single Well
	Zone 1 - 250 Feet - Wellfield
	Zone 1 - 400 Feet - Single Well
	100-Foot Wetlands Buffer
	150-Foot Surface Water Buffer
Water Bodies	
	Pond, Lake, Ocean
	Wetland
Linear Features	
	Perennial Stream
	Intermittent Stream
	Shoreline
	Dam

APPENDIX A

(provided as separate file)



ENVIRONMENTAL
 **PARTNERS**

1900 Crown Colony Drive, Suite 402
Quincy, MA 02169
P: 617.657.0200 F: 617.657.0201

envpartners.com

Exhibit 4



TOWN OF HOPEDALE

78 Hopedale Street - P.O. Box 7
Hopedale, Massachusetts 01747

Tel: 508-634-2203 ext. 212
Fax: 508-634-2200

Board of Water & Sewer
Commissioners

Ed Burt, Chair
James Morin

February 5, 2021

Dear Hopedale Board of Selectman, Attorney Peter Durning:

The Hopedale Water and Sewer Commission ("Commission") hereby requests that the Hopedale Board of Selectmen ("BOS") cease and desist from any further negotiations or agreements with the Grafton Upton Railroad and an associated real estate trust with respect to water rights for the Town of Hopedale.

The Commission has sole and "exclusive charge and control of the water department and water system." G.L.c. 41, § 69B. All "water rights" and "all works" shall be "managed, approved, and controlled" by the Commission. G.L.c. 40, § 39E. The Commission may exercise police powers to protect the water supply and watershed. G.L.c. 111, §§ 173A & 173B. The town, through the Commission, "may develop and use any source of water supply within its limits," G.L.c. 40, § 38, and may exercise eminent domain power to secure, protect, and expand the water supply. G.L.c. 40, § 39B.

Despite these and other clear mandates in the General Laws that confer vast powers upon the Commission, the BOS has voted to approve a "settlement term sheet" that seeks to abrogate and impair the authority of the Commission. Specifically, the "settlement term sheet" contains the following provisions relative to the water supply within the exclusive jurisdiction of the Commission:

- (1) build a bridge over a waterway and install a public water supply well (¶ 1(b) and (¶ 4));
- (2) commence activities for siting a new public water supply (¶ 2(a));
- (3) establish conditions before new well testing may commence (¶ 2(b));
- (4) limit the trust's obligations to ensure a new well field complies with Department of Environmental Protection regulations (¶ 2(c));
- (5) establish a funding formula to share costs of water testing (¶ 2(e));
- (6) provide trust with "sole discretion" to install monitoring wells (¶ 2(f));
- (7) record a deed relative to ground water protection (¶ 3(b));
- (8) establish a "riparian buffer zone" (¶ 3(c));
- (9) limit trust's notice to state and local authorities regarding development plans (¶ 3(d));
- (10) establish deadline for town to identify "a financeable and feasible public drinking water supply well" (¶ 5 and ¶ 6(a));
- (11) divest the Commission of any decision-making authority with respect to the trust and the railroad (¶ 6 (f)).

Please be advised that the Commission has not authorized these provisions or any other provisions in the "settlement term sheet." The Hopedale BOS lacks authority to speak on behalf of the Commission or limit the powers of the Commission. To the extent that you believe that you have reached an agreement on such matters involving current or future water rights of the Town of Hopedale, you are hereby notified that any agreement is null and void.

Respectfully, Hopedale Water & Sewer Commissioners

Ed Burt, Chair
Jim Morin

CC: Hopedale Conservation Committee

Exhibit 5

COST SHARING AGREEMENT

This Cost Sharing Agreement (the "Agreement") is made and entered into this ____ day of February 2021, by and between the following parties (the "Parties"): the Town of Hopedale, by and through its Board of Selectmen ("Board") and its Board of Water & Sewer Commissioners ("Commissioners," together with the Board, the "Town"), Jon Delli Priscoli and Michael Milanoski, Trustees of the One Hundred Forty Realty Trust (the "Trust"), and Grafton and Upton Railroad Company ("G&U") (the Trust and G&U may be referred to collectively as "GURR").

WHEREAS, the Board and GURR are parties to a Settlement Agreement dated February __, 2021, which, among other things:

- a. resolved outstanding claims in:
 - i. Town of Hopedale v. Jon Delli Priscoli, et al, Massachusetts Land Court No. 20MISC00467 (the "Land Court Matter"); and
 - ii. a Petition for Declaratory Order filed by G&U with the federal Surface Transportation Board, Docket No. FD 36464, (the "STB Matter", together with the Land Court Matter, the "Litigations");
- b. established an amicable division of property that was the subject of the Litigations, including the partition of 364 West Street into Parcels A, B, C and E as shown on a document entitled Conceptual Lotting Exhibit – January 26, 2021, which is attached hereto as Exhibit 1;
- c. provided for the conveyance of land registered under G.L. c. 61 within Parcel A by quitclaim deed(s) from GURR to the Town, or its designee, reserving to the grantor(s) and their successors a slope, grading, and utility easement in the

general location depicted on Exhibit 1, and further reserving to the grantor(s) a 100-foot wide easement for a bridge to facilitate the stream crossing over the Mill River at the general location depicted on Parcel A in Exhibit 1, and an easement for installation of a water supply well(s) or well fields for the benefit of the grantors and their successors;

- d. acknowledged that G&U will donate the non-Chapter 61 land within Parcel A to the Town, or its designee, as is, including but not limited to with all existing encumbrances;
- e. provided that the Town, in its discretion, may perform any hydrogeological analysis for the purpose of establishing a public drinking water supply well on Parcel A pursuant to 310 CMR 22.00, including, but not limited to, activities to support a Site Screening for Siting a New Public Water Supply and a pumping test pursuant to applicable state regulations (collectively the "Hydrological Analysis") at any location on Parcel A that is more than 400 feet (or 250 feet for a wellfield) from Parcel E, Parcel C, and Parcel B;
- f. provided that in the event the Hydrological Analysis performed by the Town indicates the feasibility and financial viability of a public water supply well or wellfield, GURR and its successors will work in good faith with the Town to satisfy Massachusetts Department of Environmental Protection ("MassDEP") drinking water regulations so that a well or well field may be developed; provided however, that nothing herein shall require the Trust, or its successors, to convey any land in Parcel B, Parcel C, or Parcel E to the Town, or its designee, to satisfy GURR's commitment to work in good faith; and

- g. provided that GURR shall abandon any water supply well(s) or wellfields it may have installed on any of the subject parcel when a public water supply becomes available and operational on Parcel A, and that GURR shall have the right to connect to the public water supply in consideration for its abandonment of its private well.

WHEREAS, both GURR and the Town have an interest in exploring the water resources in Parcel A to determine whether the aquifer will support either a bedrock well or wells, or a well or well field within the groundwater in the shallow overburden in Parcel A;

NOW THEREFORE, the Parties agree as follows:

1. Description of Work: The Parties agree to work cooperatively and collaboratively for their mutual benefit in: (a) performing a Hydrogeological Analysis to assess the viability of a well or wells for water supply from the groundwater located in the shallow overburden in the areas shown as "Potential Aquifer Material" on the Figure prepared by Environmental Partners Group, Inc., attached hereto as Exhibit 2; (b) performing a Hydrogeological Analysis to assess the viability of a well or wells for water supply from bedrock sources in the three areas shown as "Potential Bedrock Well Location" in Exhibit 2; and (c) performing such other work as they mutually agree to undertake to assess the viability of a water supply and/or public drinking water supply on Parcel A (tasks (a), (b), and (c) collectively are referred to as the "Work").

- a. For the avoidance of doubt, it is expressly acknowledged that the Work subject to this Cost Sharing Agreement is restricted to the Hydrogeological Analysis, and does not include costs associated with the permitting, construction, or operation of any water supply well, including, but not limited to, the costs for any other associated infrastructure for any well. All such costs for the permitting (beyond

the Site Screening and pumping test activity), construction, and operation of a water supply well(s), including any public water supply well(s), shall be borne by the Party deciding to pursue to the permitting, construction, and operation of such water supply well(s). Any Party deciding to pursue the permitting, construction, and operation of a water supply well(s) based on the information generated through the Work shall inform the other Parties in writing of their intent to establish a well or wells, including the precise location and anticipated yield from the well or wells.

- b. In the event the Parties seek to share any costs for the permitting, construction, and operation of a water supply well beyond the scope of the Work, such activity shall be separately negotiated and subject to a separate cost sharing agreement.

2. Cost Share.

- a. "Cost of Work" means the following costs associated with the Work: Joint Contractor (as that term is defined in Paragraph 3.b) fees consistent with the scope and budgets approved under Paragraph 1 and all other direct expenses mutually agreed upon in writing by the Parties. Subject to Paragraph 5 below regarding the Term of the Agreement, the Parties shall pay for the Cost of Work according to the following percentage shares: GURR shall pay 50% and the Commissioners shall pay 50%.
- b. The Parties agree that the Joint Contractors shall be retained by, and shall be invoiced by, both G&U and the Commissioners for each Party's respective share of the Cost of Work. Retention of any Joint Contractors shall be in compliance with any applicable state law relating to public contracting.

3. Responsibility for Management Work.

- a. In furtherance of the Work and the purpose of this Cost Sharing Agreement, the Parties will coordinate their communications with third parties, including Joint Contractors, and to the extent necessary, MassDEP. Each Party shall have the right to be present in all meetings and telephone conferences with MassDEP with respect to matters involving the Work. All work plans, proposals, reports, and other written communication with MassDEP concerning the Work must be mutually approved in writing in advance by both Parties and will be jointly submitted to MassDEP.
- b. The Parties will jointly select and manage technical consultants, advisors, and contractors, including a licensed professional engineer (collectively "Joint Contractors"), to perform the Work. Each Party will have open access to all Joint Contractors and will have the right to be present in meetings and telephone conferences with Joint Contractors. The Parties may jointly determine to terminate a Joint Contractor at any time and without cause.
- c. All data, written analysis, reports, or laboratory results performed by or at the direction of a Joint Contractor shall be shared with all Parties.
- d. Each Party will give the other Parties at least ten (10) days advance notice of any meeting and 20-hour advance notice (at least one business day) of any telephone conference scheduled with MassDEP or a Joint Contractor relating to matters involving the Work. Each Party, however, may contact the Joint Contractors independently regarding routine matters or to obtain information without providing advance notice to the other Party and without seeking to involve the

other Party in the communication, provided that the Parties shall instruct the Joint Contractors that such contacts are not confidential with respect to the other Party and that both Parties are to be involved in all calls involving non-routine matters and matters of strategic importance.

- e. Nothing in Paragraph 3.d. or Paragraph 3.a shall prevent either Party from accepting telephone calls from MassDEP. Each Party shall promptly report to the other Party the substance of any telephone calls or other communications with MassDEP relating to the Work that involve non-routine matters or matters of strategic importance.

4. Unilateral Assessment Work. If either Party unilaterally undertakes assessment activities beyond the scope of the Work, that Party shall be solely responsible for the cost of any such assessment. It is expressly acknowledged that there are Potential Aquifer Material areas show on Exhibit 2 that are located exclusively within Parcel B. Any Hydrological Analysis work performed by GURR on Parcel B is not subject to this Cost Sharing Agreement.

5. Term. This Agreement shall be effective on the date first written above (the "Effective Date") and shall remain in effect until such time as the Work is completed, unless terminated earlier as provided herein. The Agreement may be extended only by written agreement of the Parties.

6. Termination. Any Party may terminate this Agreement upon thirty (30) days written notice to the other Parties. The terminating Party shall remain responsible for all of that Party's share of the Cost of Work incurred through the effective date of the termination. The Agreement may also be terminated for breach pursuant to the terms of Paragraph 8.

7. **Internal Costs.** Each Party shall be fully responsible for its own internal costs, including but not limited to legal and consulting fees or the internal costs of the Hopedale Water Department, in implementing this Agreement. Such costs shall not be subject to the cost sharing outlined in Paragraph 2.

8. **Breach.** The Parties agree that in the event of a breach of this Agreement by any Party, the Parties shall attempt in good faith to resolve the dispute through a dialogue between responsible representatives of the Parties. If the Parties are unable to resolve any such dispute during the two-week period immediately following commencement of the discussion, then, at the written request of any Party, the Parties shall attempt to settle the dispute by non-binding mediation under the procedures of REBA Dispute Resolution, Inc. The neutral in any such proceeding shall be selected by and agreed to by both Parties, shall be an expert in the particular matter, and shall be available to serve on short notice. All statements of any nature made in connection with the non-binding mediation shall be privileged and shall be inadmissible in any subsequent court or other legal proceeding involving or relating to the same claim. The mediation process shall continue until the first to occur of: (a) resolution of the dispute; (b) the forty-fifth (45th) day after the Parties agree on the identity of the neutral for such mediation; or (c) a determination by the neutral that resolution is not reasonably possible in a mediation proceeding. The costs of the neutral shall be borne by the Parties jointly on an equal basis. The Parties shall pay their own attorneys' fees, consultant fees, and other costs of mediation. If at the end of the mediation process the Parties fail to resolve the dispute, the Party or Parties claiming breach shall have the right to take any action, in law or equity, available to such Party, including, but not limited to, bringing suit in the Massachusetts Superior Court or other court of competent jurisdiction for injunctive or other relief.

9. Successors and Assigns. This Agreement shall be binding upon the successors and assigns of the Parties. No assignment or delegation to make any payment or reimbursement hereunder will release the assigning Party without prior written consent of the other Parties hereto, which approval shall not be unreasonably withheld.

10. Waiver. The failure of any Party to enforce at any time or for any period of time any of the provision of this Agreement will not be construed to be a waiver of such provisions or of its right thereafter to enforce such provisions and each and every provision thereafter. Termination of this Agreement does not affect the accrued rights and remedies a Party may have prior to such termination.

11. Entire Agreement. This Agreement constitutes the entire agreement with respect to the subject matter addressed herein and supersedes any prior written and/or verbal agreements between the Parties.

12. Third Parties. This Agreement is not intended for the benefit of any third party and is not enforceable by any third party, including, but not limited to, federal and state regulatory authorities.

13. Severability. The provisions of this Agreement are severable and should any provision be deemed for any reason to be unenforceable the remaining provisions shall nonetheless be of full force and effect; provided however, that should any provision be deemed unenforceable by a court of competent jurisdiction, the parties shall negotiate in good faith to cure any such defect(s) in the subject provision(s).

14. Amendments: This Agreement may not be orally modified. This Agreement may only be modified or amended in a writing signed by all of the Parties.

15. Headings. All headings and captions in this Agreement are for convenience only and shall not be interpreted to enlarge or restrict the provisions of the Agreement.

16. Execution in Counterparts; Execution by Facsimile or PDF. This Agreement may be executed in counterparts and all such counterparts when so executed shall together constitute the final Agreement as if one document had been signed by all of the Parties. The Parties agree that facsimile or Portable Document Format ("PDF") signatures shall have the same binding force as original signatures, again as if all Parties had executed a single original document.

17. Applicable Law. This Agreement shall be construed and interpreted in accordance with the laws of the Commonwealth of Massachusetts. This Agreement shall not be construed against any of the Parties, including the drafter thereof, but shall be given a reasonable interpretation under the circumstances. Nothing in this Agreement shall abrogate the application of any applicable federal or state law, including, but not limited to, the Clean Water Act and the Safe Drinking Water Act, to the extent applicable.

18. Notice. All notices and other communications provided for herein shall be in writing and shall be delivered by hand or overnight courier service, electronic mail with proof of receipt, facsimile, or mailed by certified or registered mail, to the respective addresses as follows:

To the Trust:

One Hundred Forty Realty Trust
c/o Michael Milanoski, Trustee
Grafton & Upton Railroad Company
P.O. Box 952
Carver, MA 02330
mmilanoski@firstcolonydev.com

With a copy to:

Donald C. Keavany, Esq.
Christopher Hays Wojcik &
Mavricos, LLP
370 Main Street, Suite 970
Worcester, MA 01608
dkeavany@chwmlaw.com

To G&U:

Michael Milanoski, President
Grafton & Upton Railroad Company
P.O. Box 952
Carver, MA 02330
mmilanoski@firstcolonvdev.com

To the Board of Selectmen:

Brian R. Keyes, Chair
Board of Selectmen
78 Hopedale Street
P.O. Box 7
Hopedale, MA 01747
bkeyes@hopedale-ma.gov

To the Board of Water & Sewer Commissioners:

Edward J. Burt, Chair
Hopedale Board of Water & Sewer
Commissioners
78 Hopedale Street
P.O. Box 7
Hopedale, MA 01747
eburt.hd@gmail.com

With a copy to:

Donald C. Keavany, Esq.
Christopher Hays Wojcik &
Mavricos, LLP
370 Main Street, Suite 970
Worcester, MA 01608
dkeavany@chwm1aw.com

With a copy to:

Diana Schindler
Town Administrator
Town of Hopedale
78 Hopedale Street
P.O. Box 7
Hopedale, MA 01747
dschindler@hopedale-ma.gov

With a copy to:

Tim Watson, Manager
Town of Hopedale Water &
Sewer Department
78 Hopedale Street
P.O. Box 7
Hopedale, MA 01747
twatson@hopedale-ma.gov

[signatures on following page]

IN WITNESS WHEREOF, the Parties have executed or have caused their proper representatives to duly execute this Agreement as of the Effective Date first written above.

TOWN OF HOPEDALE

By its Board of Selectmen



Donald Scyres

By 

Louis Arcudi

By _____
Glenda Hazard

By its Board of Water & Sewer Commissioners

By _____
Ed Burt

By _____
James Morin

By _____

**JON DELLI PRISCOLI and
MICHAEL R. MILANOSKI, as
TRUSTEES of the ONE HUNDRED
FORTY REALTY TRUST**

By 

Jon Delli Priscoli, Trustee

By 

Michael Milanoski, Trustee

**GRAFTON & UPTON RAILROAD
COMPANY**

By 

Michael Milanoski, President

Exhibit 6



TOWN OF HOPEDALE

78 Hopedale Street - P.O. Box 7
Hopedale, Massachusetts 01747

Tel: 508-634-2203 ext. 212
Fax: 508-634-2200

Board of Water & Sewer
Commissioners

Ed Burt, Chair
James Morin
Don Cooper

To Hopedale Select Board

Dec 20, 2021

As discussed during last Thursday's Water & Sewer Commission meeting, new information regarding the development impact to the West St property has been raised.

GURR's plans for West St have been ever changing. The original "track expansion and possibly a warehouse" has expanded to "maybe 7 warehouses or some super warehouses with light manufacturing" as presented by GURR's President at a recent Select Board Meeting.

Using GURR's latest plan of 7 warehouse or some combination of warehouses and super warehouses, the associated impact cost due to the lost forestry within the watershed is significant. This expense may not have been factored in during the Settlement discussions because of an expectation of minimal forest clearing, which is clearly not the case now.

After the Settlement was agreed to between the Select Board and GURR, GURR was awarded a \$500,000 IRAP grant. GURR's IRAP project description specifically defined track expansion to ensure safe rail transportation for existing and future customers, while also providing space for warehouse expansion. This project was completed at the Hopedale Railyard this past August.

Referring back to the eminent domain filing, the DOT requested more information from GURR explaining why they needed the West St property. GURR's response was a project definition almost identical to the IRAP project, track expansion a possibly a warehouse.

Also, after the Settlement, GURR's super warehouse plans were denied in Holliston.

Today, regardless of the exact number of warehouses, it is evident that GURR will clear a significant portion of the forest. An EPA estimate has calculated that the impact of the future MS4 burden caused by the lost watershed forest land to be more than a million dollars, plus costs associated with related water supply issues.

The magnitude of GURR's development plans raises the question if it is even possible for the Settlement to achieve the intended water supply protection goals.

Fortunately the court ruling has provided the Town with a new opportunity to acquire the entire property. Which is why we wanted to pass this information along as soon as possible. If anything else is needed from us, please do not hesitate to ask.

Thank you

Ed Burt Hopedale Water & Sewer Commission

cc Hopedale Conservation Committee, Finance Committee
Attorneys B. Riley (KP), Peter Durning (MS&D), David Lurie (Lurie and Friedman)

Exhibit 7



TOWN OF HOPEDALE

78 Hopedale Street - P.O. Box 7
Hopedale, Massachusetts 01747

Tel: 508-634-2203 ext. 212
Fax: 508-634-2200

**Board of Water & Sewer
Commissioners**

Ed Burt, Chair
James Morin
Don Cooper

To: Hopedale Select Board

February 18, 2022

We are writing to convey the Hopedale Water and Sewer Commission's objection to GURR's continued land clearing proposal within the 364 West St property in the name of water supply well exploration.

The W&S Commission has NOT approved any resources (financial, equipment or personnel) to be utilized for such a project, nor have we received Town Meeting authorization to do so.

The following current projects should each be taken to conclusion to confirm the related impact on any new water supply aspects at the West St location:

- Complete the existing new water source exploration in the Green St area
- Complete the new Water Tank design, funding research, and hopefully construction
- Complete the PFAS removal research, funding options and associated plant upgrades.

Each project has an impact on the requirements and timing of any potential future wells at West St, making all of them a priority ahead of the West St exploration.

Additionally, because of the high cost to connect any West St source to the existing Hopedale Water system infrastructure, the potential of the West St location should be planned along with the Milford Water Company. This planning has not even begun yet, as the Town of Milford recently took over that independent water company. Nor has this potential location been vetted by the DEP, the ultimate authority over a new public water supply source.

Most importantly, the negative impact to the current water supply caused by any more land clearing within the West St watershed would only exacerbate today's water supply concerns and issues. This point cannot be emphasized enough.

The oversight of the water supply, watershed and water exploration is the Water & Sewer Commission's legal responsibility. Please represent our decisions and opinions as part of the West St court proceedings accordingly.

Sincerely,

Ed Burt Hopedale Water & Sewer Commission, Chair

Exhibit 8

Hopedale Special Town Meeting
March 26, 2020

Water & Sewer Recommendation
Article 8

To authorize funds for the “smaller parcel”, Parcel A of the Settlement
Agreement

W&S Recommendation - No

Hopedale Water & Sewer Commission's position is that the magnitude of the RR development allowed by the Settlement does not provide the necessary protect to the current water supply.

Nor does it provide the assurances to protect the area for a potential future water supply.

Importance of the land: the Hopedale Watershed



364 West Street, Hopedale's Watershed

Attorney Durning – Land Court Filing:

The Town has a significant public interest in protecting its municipal water supply. The Chapter 61 Land is hydraulically-upgradient of all of Hopedale's public water supply sources and provides an important buffer for protection of the Town's public water supply wells. It is also the only optimal location for siting a new public water supply source in the Town, and ownership of the Chapter 61 Land would ensure that future land uses on the parcel are consistent with water supply protection and would not adversely impact groundwater quality. See also *New England Forestry Found., Inc. v. Bd. of Assessors of Hawley*, 468 Mass. 138, 151 (2014) (“[P]roperly preserved and managed conservation land can provide a tangible benefit to a community even if few people enter the land ... [F]orest land ... regulates and purifies the fresh water supply by stabilizing soils that store water over time and filter contaminants.”).

Blackstone River Watershed Association

“these forest and wetlands are critical parts of the Mill River watershed “

“Intact forest and wetlands that are found on this property represent the best ecotypes for providing natural filtration, recharging groundwater and maintaining stream water quality. Located along the Mill River, near the Hopedale Parklands, **the value of this large tract of open space for the future of Hopedale can not be overstated.**”

www.theBRWA.org

Impact / Magnitude of RR Development

Importance of the Watershed –

In natural state, intact forest and wetlands

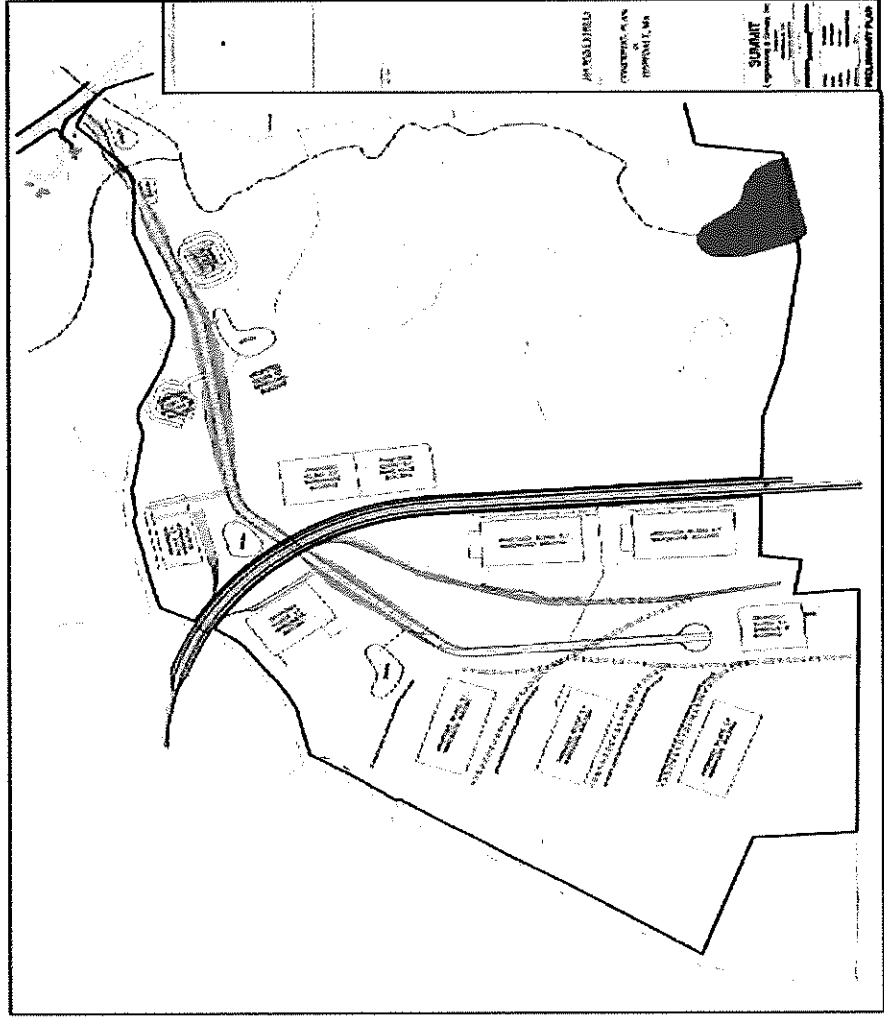
Attorney Durning – Court Filing:

Development of any part of the Chapter 61 Land requires site work and tree clearing activities that would irreparably alter the Chapter 61 Land and impair the benefits it provides for protection of the municipal water supply.

Environmental Partners, Screening Report:

- ownership of (entire) Chapter 61 parcel would insure that future land uses of the parcel are consistent with water supply protection and would not adversely impact ground water quality.

RR Development – 7 warehouse plan



Parcel A - 64 Acres, off which 20 to 40 acres are wetlands

- Abuts significant RR development
- Allowed on Parcel A - RR can establish a private well, build a road/bridge, use it replicate wetlands
- Parcel B,E are designated for RR development
- Parcel C bridge/road, available for future RR development

Statement from Environmental Partners:

- (Environmental Partners) noted that RR development activities could be a significant factor in any new source approval for a well by MassDEP, including the possibility that a viable source might be denied without sufficient land use restrictions within the Zone I or Zone II of the well.

(Some of WS Commission's supporting information)

Topics from prior discussions

- Impact analysis – the costs associated with developing within a watershed
- Railroads Federal Preemption

Impact of clearing the forest within a watershed

EPA analyst translates the impacts into a dollar value

Runoff, Recharge and Nutrient Load Export impacts due to converting Forested Area to Impervious cover											
Parameter	Naturally Vegetated	Impervious Cover (IC)	No Controls Applied at Time of Development			MS4 Post Construction Controls Applied at Time of Development					
			Net Change due to IC Conversion w/o Controls	Net Change due to IC Conversion w/ Controls	Percent Change due to IC Conversion w/o Controls	Future Retrofit Costs to Offset Lost recharge and Increased Nutrient Export	% Removals assuming MS4 Post Construction Standards are applied*	Net Change due to IC Conversion assuming MS4 standards applied	Net % Change IC conversion w/ MS4 control	Future Retrofit Cost to eliminate recharge deficit and increased nutrient export, \$/IC acre	
Precipitation MGal/acre/yr	1.159	1.159	0	0	0%		0%	0%			
Annual Runoff MGal/ac Yr	0.129	1.091	0.962	0.962	746%			51%	0.406	314%	
Recharge MGal/Ac Yr	0.45	0	-0.45	-0.45	-100%	\$ 33,710		41%	-0.003	-1%	\$ 202
Phosphorus Load, lb/ac/Yr	0.10	1.3	1.70	1.70	1700%	\$ 64,124		60%	0.620	620%	\$ 23,386
Nitrogen Load Load, lb/ac/Yr	0.50	15.1	14.6	14.6	2920%	\$ 44,092		88%	1.312	262%	\$ 3,962

* Assume 60% P removal for infiltration in HSG C soils is most limiting factor for determining MS4 level of control

Cumulative Impacts Conversion of Natural Land to Impervious Cover (IC)

- **Hydrologic Impacts**
 - Increased Annual Runoff Volume ~300% to 10,000% increase (0.5 to 1.1 MG/acre/year)
 - **Lost Annual Groundwater Recharge** ~300,000 to 500,000 gallons/acre/year
- **Increased Nutrient Export**
 - Increased Annual Stormwater **Phosphorus Load** ~300% to 10,000% increase (1.5 to 1.9 lbs/acre/year)
 - Increased Annual Stormwater (SW) **Nitrogen Load** ~500% to 13,000% increase (11 to 13 lbs/acre/year)

Impact of clearing the forest within a watershed

Statement from impact analysis:

- Today, regardless of the exact number of warehouses, it is evident that GURR will clear a significant portion of the forest. An EPA estimate has calculated that the impact of the future MS4 burden caused by the lost watershed forest land to be more than a million dollars, plus costs associated with related water supply issues.

Variables used:

50 acres of cleared forestland (~half of what GURR would own)
\$30 impact value, which is less than the midpoint range assuming good Storm Water Management (calculation range is \$20 to \$50)

Must be vetted matching detailed development plans to the specific land

RR Preemption

Although RR's have the benefit of a broad federal preemption, it is not a license to anything / everything... situational

364 West St:

RR Land Development vs Water Supply Protection

RR Preemption

Eminent Domain Filing:

RR requirement, plan for 364 West St =
Track expansion and 'a' warehouse

IRAP grant (\$500,000), completed in August of 2021, at current
Hopedale railyard ->

Track expansion and warehouse expansion

Does RR even need 364 West St for rail transportation reasons any
more?

Congressman Auchincloss serves on the following House Committees:

- Committee on Transportation and Infrastructure
- Subcommittee Assignments:
 - Highways & Transit
 - Coast Guard & Maritime Transportation
 - Railroads, Pipelines, and Hazardous Materials

Conclusion

WS recommendation is against article 8 (NO)

Before the settlement, after Town Meeting Authorization, Nov 2020:

364 West St, per RoFR = \$1.2 Million;

2 Private Donations = \$1.2 Million

plus a committed for legal fees

RR Land Development vs Water Supply Protection

END STM

Misc

vii. It is agreed that the intent of the well-testing process set forth in Section 1(a) is to provide appropriate mitigation measures to assist the Town, **but it is not intended to stop or curb development of adjoining Parcels, B, C or E.**