

The Cascade 40B Apartment Complex

Threats to Pine Brook and the Wayland community



Agenda:

MCGREGOR & LEGERE, PC

MASSACHUSETTS ENVIRONMENTAL LAWYERS FOR OVER 40 YEARS

Legal and regulatory review

Tom Largy

Past president, Greater Boston Trout Unlimited and current member of the Wayland Surface Water Quality Committee

Ecosystem Solutions Inc.

Environmental review

Scott W. Horsley

Hydrology expert who advised the EPA and served on the MassDEP Stormwater Advisory Committee, Sustainable Water Initiative, Climate Change Adaptation Advisory Committee and Title 5 Wastewater Advisory Committee

Luke H. Legere, Esq.

Legal and regulatory review

1. Crucial information is still missing despite repeated promises, including the hydrogeological study and flood zone specifications.
2. The Applicant delivered a new Project design six months after filing his Comprehensive Permit Application.
3. Despite all this, the Applicant refused to grant or even negotiate the reasonable extension to the 40B schedule requested by the ZBA.
4. The new Project design retains the fatal defects in the original proposal, due to the Applicant's refusal to reduce the number of units he wants to pack onto this environmentally sensitive site.
5. The Project would violate Wetlands and Rivers Protection Act regulations, and cause significant environmental harm , severely degrading valuable and rare wildlife habitat.

Luke H. Legere, Esq.

Legal and regulatory review

6. The Project would threaten the health and safety of children at YMCA Camp Chickami.
7. The Project cannot be conditioned to protect these important local concerns, and the Applicant's requested waivers would remove important local safeguards intended to protect those interests.

We urge the Board to reject this Application and deny the Project a Comprehensive Permit. The time for delays and promises is past.

Tom Largy

Past president, Greater Boston Trout Unlimited and current member of the Wayland Surface Water Quality Committee

Development Threats to Eastern Brook Trout

1. Consistent water temperatures
2. Clear water
3. Clean water

This review is designed to be simple and clear, but is backed by scientific research. References are included for each impact to Eastern Brook Trout in the right most column.



Threats to Eastern Brook Trout

Development impacts to avoid



EBT ENVIRONMENTAL CONSULTANTS, INC.

Introduction

Eastern Brook Trout (*Salvelinus fontinalis*) are a regional icon, recreationally and culturally important and a key indicator of water quality for river habitats. Unfortunately, a range-wide assessment of Brook Trout populations throughout the eastern United States (Hudy et al. 2005) revealed a sharp decline. Intact populations of wild Brook Trout exist in only 5% of the watersheds assessed – greatly reduced or completely eliminated from nearly half of the watersheds in their native range. The vast majority of large rivers where Eastern Brook Trout formerly were common no longer support sustaining populations.

Urbanization and industrial development have been key factors, and we can take basic steps to curb the impact of new development on sensitive streams – to preserve the Eastern Brook Trout that remain and improve our streams.

Eastern Brook Trout require:	Development threats to avoid:	Impacts:
<p>Consistent water temperatures Brook trout thrive in summer water temperatures between 55F and 65F (Raleigh 1982).</p>	<ul style="list-style-type: none">• Removal of trees that shade the stream• Warmer runoff water, e.g. from parking lots, roadways and roofs• Warmer subsurface water from septic system leach fields	<p>Reduced growth and population Higher temperatures limit the growth and distribution of juvenile brook trout (McCormick et al. 1972) and population density is negatively correlated with increased July mean water temperatures (Hinz and Wiley 1997).</p> <p>Exposure to temperatures of 75F for only a few hours is typically lethal (Flick 1991).</p> <p>Removal of a stream's tree canopy or excessive clear-cutting within a watershed can result in thermal pollution (Hall and Lantz 1969; Platts and Nelson 1989).</p> <p>Reducing overhead cover along the stream margin can be a major factor limiting brook trout abundance (Enk 1977).</p>

Eastern Brook Trout require:	Development threats to avoid:	Impacts:
<p>Clear water</p> <p>Brook trout require clear water without silt and turbidity for feeding, spawning and survival.</p>	<ul style="list-style-type: none"> • Excavation and construction near streams and adjoining wetlands • Removal of trees which stabilize stream banks, provide Trout habitat, absorb stormwater, reduce floodwater velocity and erosion • Removal of natural undergrowth and groundcover which stabilize stream banks, reduce floodwater velocity and erosion • Reduced flood zone capacity which accelerates flood water and erosion • Construction with impermeable surfaces, which increase stormwater runoff and erosion 	<p>Reduced food supply, spawning and population</p> <p>Sediment from side slopes and erosion causes significant streambed movement and stream turbidity (James 1956; Burns 1972).</p> <p>Removal of trees reduces the availability of large woody debris that stores sediment and provides cover for fish, it allows increased surface erosion, and it allows larger seasonal water temperature fluctuations (Chamberlin et al. 1991).</p> <p>An accelerated rate of sediment deposition in streams can adversely affect brook trout by reducing the production of food organisms (Raleigh 1982; Everest et al. 1987).</p> <p>Sediment and reduced dissolved oxygen content can smother trout eggs and embryos in spawning areas, AKA 'redds' (Raleigh 1982; Everest et al. 1987; Reiser and White 1988).</p> <p>Sediment can fill pools, causing a loss of overwintering habitat (Fisk et al. 1966; Raleigh 1982; Rabeni and Smale 1995).</p> <p>Brook trout are opportunistic sight feeders (Wiseman 1951; Benson 1953; Reed and Bear 1966) and particularly susceptible to even moderate turbidity levels because this reduces their ability to locate food (Bachman 1958; Herbert and Merckens 1961; Sweka and Hartman 2001).</p>

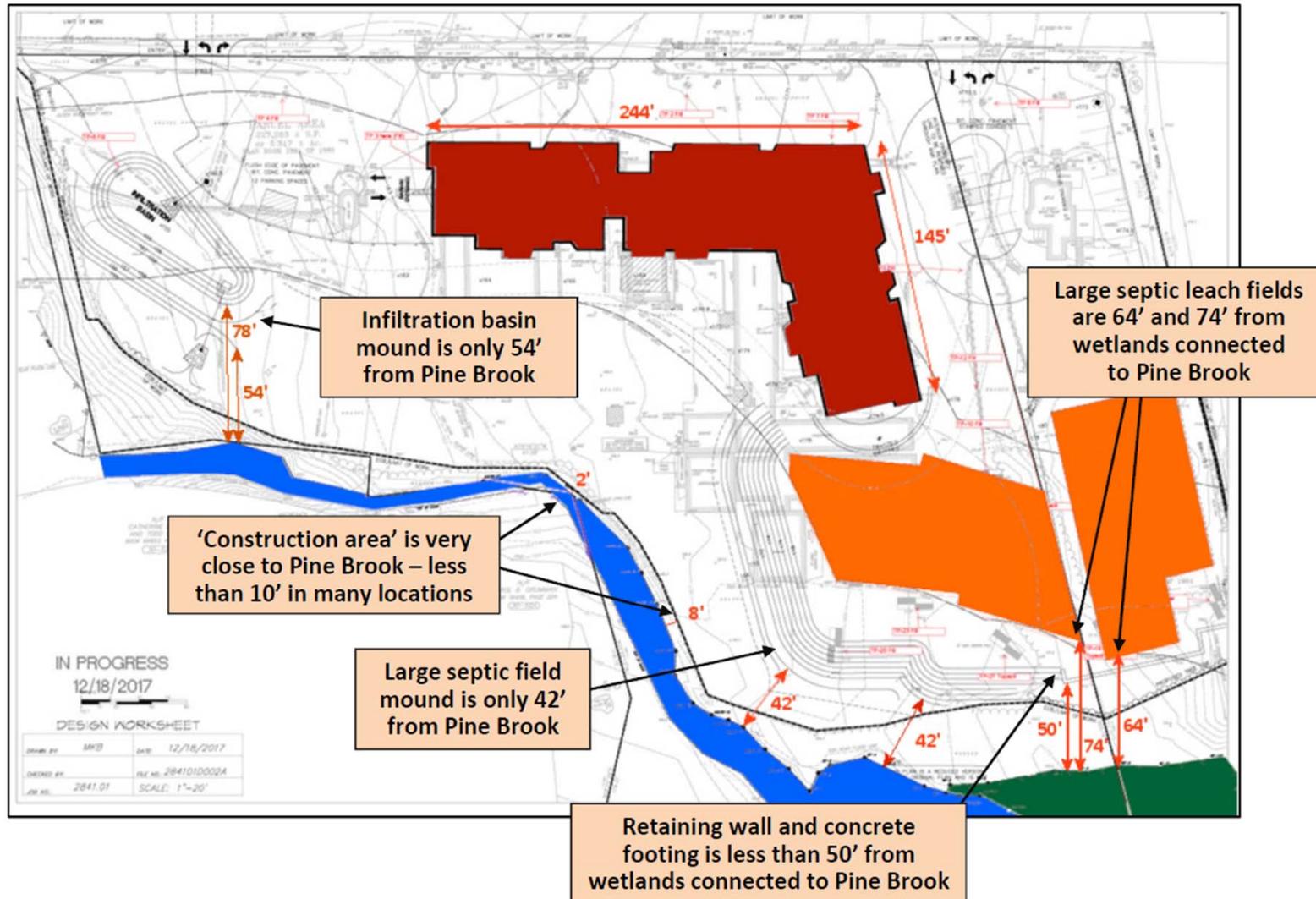
Eastern Brook Trout require:	Development threats to avoid:	Impacts:
<p>Clean water</p> <p>Brook trout require clean water – not contaminated by salt, nitrogen, potassium, household chemicals, automotive contamination and bacterial / viral loads</p>	<ul style="list-style-type: none"> • Runoff from driveways and parking areas which contain hydrocarbons, tire rubber particles and salt • Runoff from lawns, gardens and flower beds which contain elevated levels of nitrates • Effluent from septic leach fields which contains elevated levels of nitrates, phosphates, household chemicals, chlorine, medications and significant pathogen loads (bacteria, parasites and viruses) 	<p>Reduced food supply, spawning and population</p> <p>Increased levels of nitrates and phosphates promote algae growth which reduces dissolved oxygen. Brook trout require dissolved oxygen concentrations greater than 5 mg/L (Avault 1996). 7 mg/L or more is optimal (Raleigh 1982).</p> <p>Changes in pH level impact Brook Trout eggs and hatchling survival. (Menendez, 1976; Ingersoll et. al.. 1990).</p> <p>Aluminum is especially damaging to brook trout as inorganic monomeric aluminum (Alim) can interfere with gill function by precipitating onto the gills (Downey & Hampton, 2009; Baldigo et. al., 2007).</p> <p>Brook trout and other fish are susceptible to pathogens found in humans and waste water systems, e.g. Flavobacterium. (Loch & Faisal, 2015)</p>

Environmental review:

1. Threats from the Cascade Version 2 plan
2. FEMA and Wayland flood zones
3. Impacts on the Pine Brook environment
4. Downstream impacts
5. Conclusions

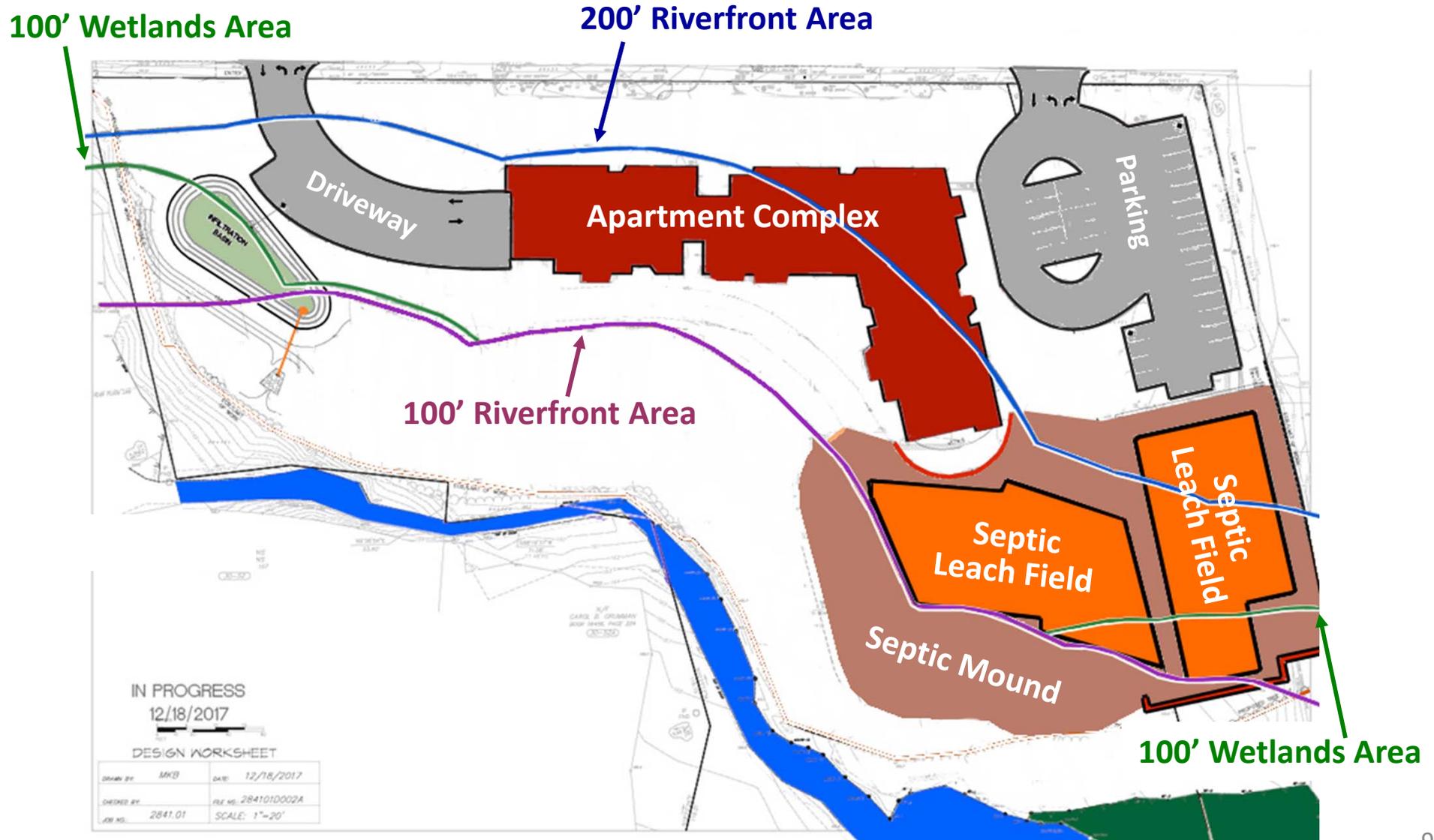
Environmental Review

Threats from the new 'Version 2' plan for the Cascade 40B apartment complex are identical to Version 1. Changes did not solve basic problems, which are driven by the attempt to pack 60 apartments into this small site – next to Pine Brook:



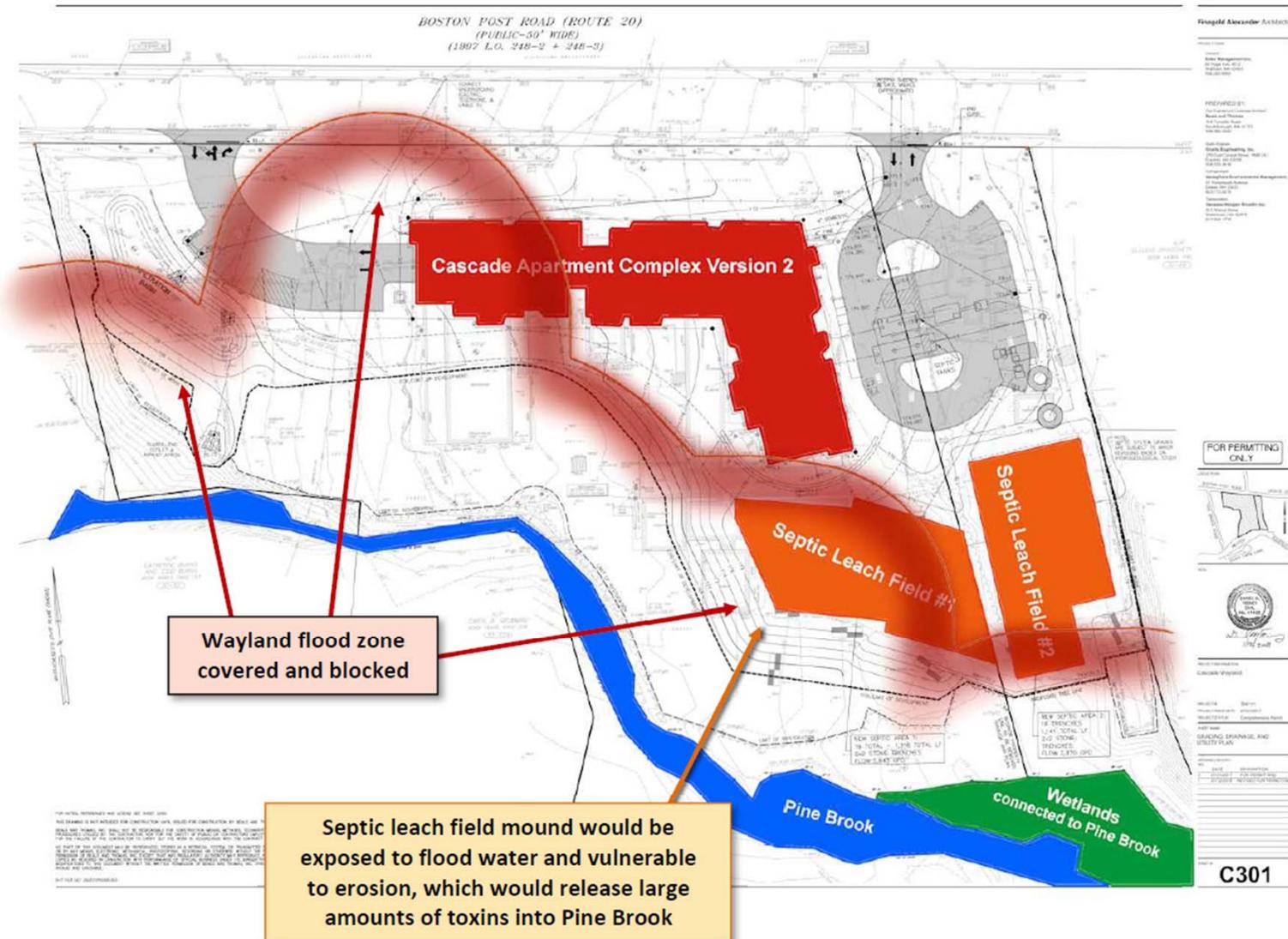
Environmental Review

'Version 2' includes extensive heavy excavation and construction well within the 100' Riverfront and Wetlands resource areas. Most of the large apartment complex is inside the 200' Riverfront area:



Environmental Review

'Version 2' also fills in the Wayland flood zone, just like Version 1. As FEMA notes, the ZBA should rely on *local* knowledge of flood risks in addition to basic FEMA maps. Wayland's own flood zone map is a perfect example:



Environmental Review

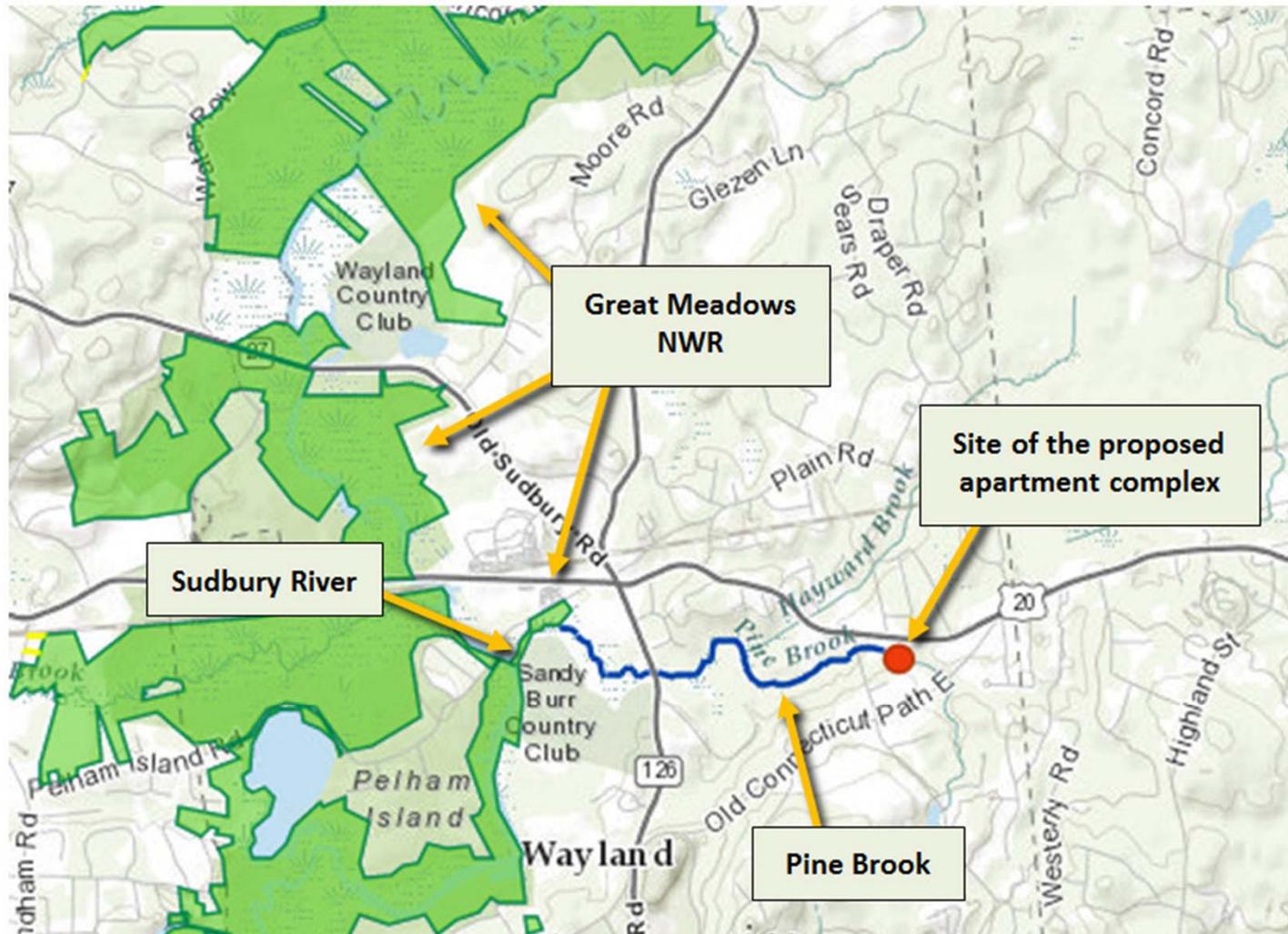
Impacts on Pine Brook created by the Cascade V2 plan:

1. **Increased water temperature:** Removal of many trees, particularly near the large septic leach fields and Pine Brook. Hot stormwater from the roof in summer. Large volumes of wastewater from the septic leach fields.
2. **Increased water turbidity:** Excavation and construction. Removal of many large trees and undergrowth. Reduced flood zone capacity, increased floodwater velocity and increased flood damage. Increased erosion.
3. **Decreased dissolved oxygen:** Wastewater, phosphates and eutrophication caused by the large septic leach fields next to Pine Brook.
4. **Changes in Ph level:** Phosphates and contamination from the large septic leach fields. Salt from the driveways, parking areas and garage. Increased erosion.
5. **Water pollution:** Salt and hydrocarbons from the driveways, parking areas and garage. Household chemicals, chlorine and medications from the large septic leach fields.
6. **Pathogens:** Viruses and bacteria from the large septic leach fields.

These impacts would result in reduced spawning, growth and population -- a tragedy for the #1 Trout stream in the Boston Metrowest area, and the citizens of Wayland.

Environmental Review

We must remember that Pine Brook is part of an *ecosystem*. Pollution will also impact threatened / endangered species one mile downstream from the site in Great Meadows National Wildlife Refuge – an important NHESP site:



Environmental Review

Conclusions:

1. **The Cascade V2 Application does not comply** in a number of key areas with the Massachusetts Wetlands and Rivers Protection Acts and related regulations.
2. **We concur with the concerns raised** by the Wayland Departments of Health, Conservation and Planning.
3. **We concur with the concerns raised** by the West Suburban YMCA, OARS, Trout Unlimited and Temple Shir Tikva.
4. **Cascade V2 would create serious risks to Pine Brook**, everything that lives in and around it, and important natural resources downstream.

The Wayland ZBA should not grant any waivers from Town bylaws and must require strict compliance with the WPA and RPA. You have significant and sufficient grounds to deny the applicant's Comprehensive Permit based on threats to the environment and public safety.

Scott W. Horsley

Hydrology & Water Resources Consultant

Background:

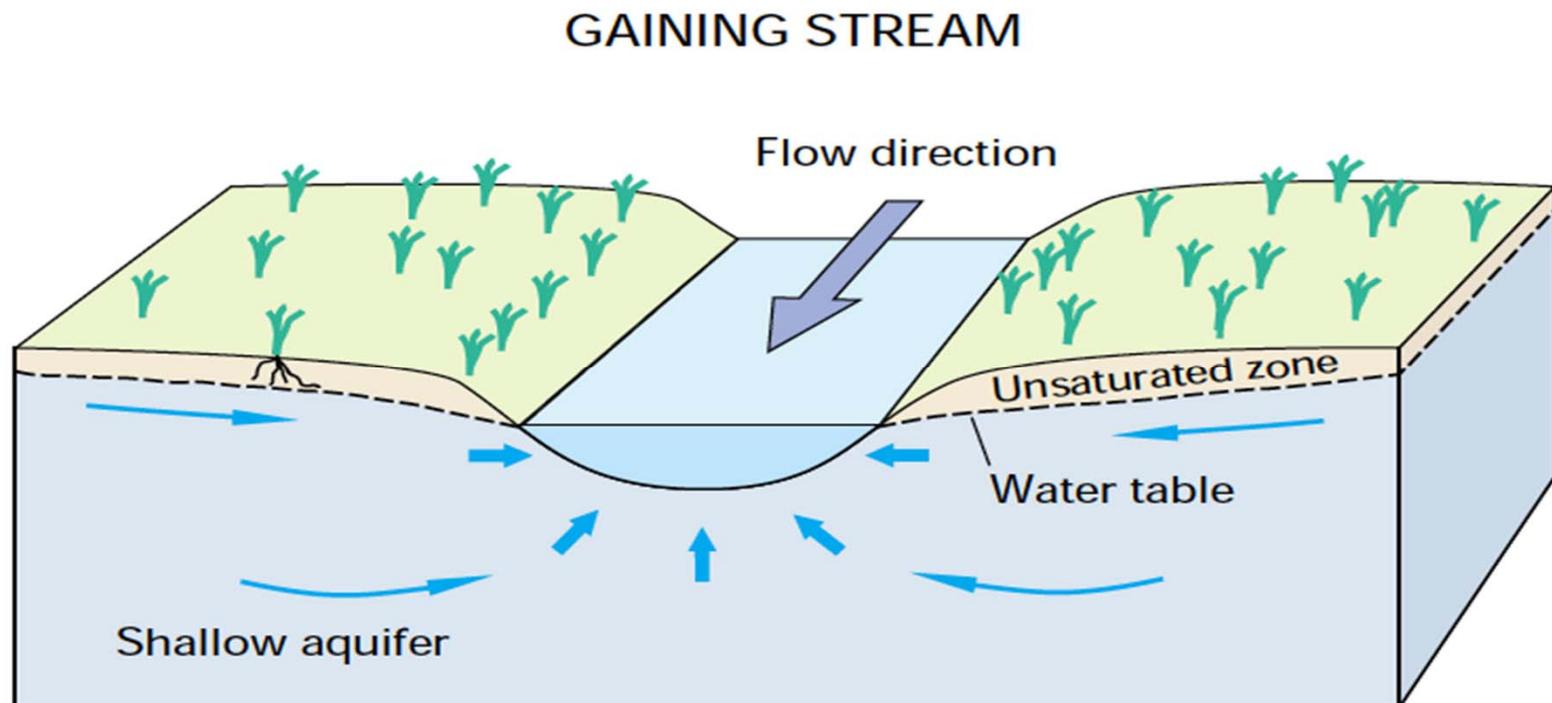
- Thirty years of experience as a consulting hydrologist, including with the U.S. Environmental Protection Agency and MADEP.
- Developed Watershed Protection Guidance documents and provided related training in 43 states nationwide.
- Served on the MADEP Stormwater Advisory Committee, Sustainable Water Initiative, Climate Change Adaptation Advisory Committee and Title 5 Wastewater Advisory Committee.
- Assisted in the preparation of the Massachusetts Smart Growth and Smart Energy Toolkit.
- Serve as adjunct faculty at Tufts University and Harvard Extension School for graduate courses in Water Resources Management, Low Impact Development, and Green Infrastructure.

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Key issues with the Cascade Version 2 plan:

1. **The Cascade site is a riparian area** with a shallow water table. Rate of flow, temperature and water quality are critical to sustaining the valuable Pine Brook habitat.



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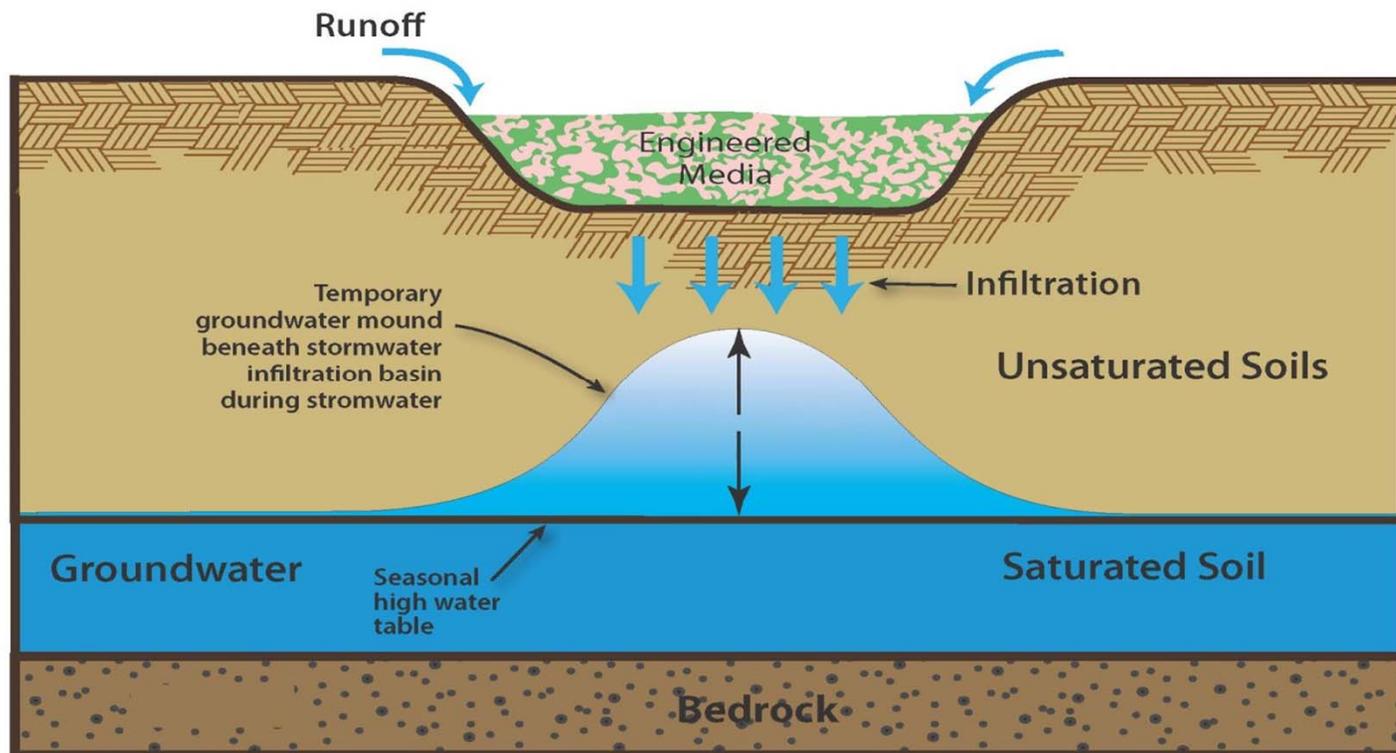
2. Town of Wayland Regulations

- a) **Board of Health Regulations** for On-Site Subsurface Sewage Disposal Systems, Section II (Design Requirements), Subsection D (Distances): 100 feet for a facility with a design flow greater than 1000 gallons per day – the minimum that may be increased for “multiple” dwellings or “higher volume sewage discharges”.
- b) **Subsection L (Hydrogeological Evaluation):** Wastewater flows of >9,000 gallons per day are required to have a hydrogeological evaluation with review by the Board of Health to determine that “...the ground and surface water is not compromised.”
- c) **Subsection C4 (Leaching Facilities):** Systems designed to receive more than 1000 gallons per day must be at least four feet above the maximum ground water elevation including mounding. Groundwater mounding calculations must be, “... submitted to the Board of Health for review.”

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- 3. Test pits indicate the pre-development seasonal high water table is as shallow as 3-4 feet beneath the surface.** Ledge was also found. Both limit the proper functioning of septic systems and stormwater infiltration systems with minimum vertical separation distances above the high water table (4 feet & 2 feet respectively).

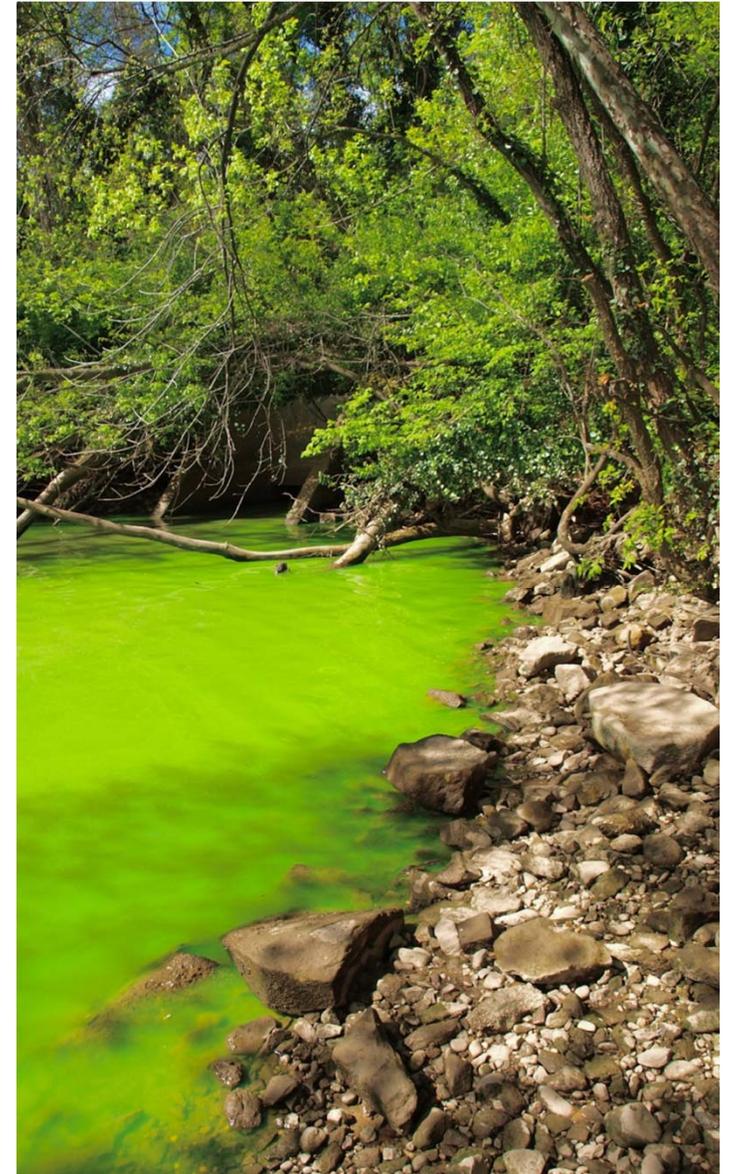


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- 4. Wastewater contains significant loads of nutrients** that can cause eutrophication – primarily phosphorus in fresh water – leading to depleted oxygen levels, algae blooms, macrophyte growth and significant declines in habitat quality.

This can result in “impaired waters” under the Clean Water Act and Massachusetts Surface Water Quality Standards (314 CMR 4.00).



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- a) **Eutrophication** negatively impacts the spawning, growth and population of Eastern Brook Trout and other wildlife in and around Pine Brook.
- b) **Wastewater also contains household chemicals, chlorine and medications** that will contaminate Pine Brook.
- c) **Given high sewage flow rates and close proximity to Pine Brook** the hydrogeological analysis should be conducted with conservative assumptions that include steady state conditions and long-term impacts on water quality and wildlife.



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5. **The wastewater discharge will include significant loads of pathogens including bacteria and viruses.** Viruses have been shown to travel in groundwater for 200 feet or more. Cascade's septic leach field mound is only 42 feet from Pine Brook .
 - a) **Microbial contamination is important because human infection and disease result** from small quantities of pathogens, particularly enteric viruses associated with diarrhea and gastroenteritis, respiratory infections, conjunctivitis, hepatitis, and diseases with high mortality rates including aseptic meningitis, encephalitis and paralysis in immunocompromised individuals. Some enteric viruses have been linked to chronic diseases such as myocarditis and diabetes.
 - b) **The Cascade Project site warrants a careful analysis of pathogen transport** to ensure that pathogens are not discharged to the brook. YMCA Camp Chickami is located directly downstream and children who play in the brook and adjacent ponds would be put at risk if a major source of pathogens is introduced into Pine Brook.

Reports, studies and data created by:

MCGREGOR & LEGERE, PC

MASSACHUSETTS ENVIRONMENTAL LAWYERS FOR OVER 40 YEARS

Legal and regulatory review: Version 2

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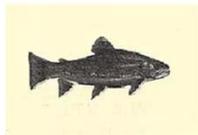
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Development risks to Eastern Brook Trout

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