Final Subdivision  
PLPZ 2020 00192  

Aquarion Water Company of Connecticut  
Proposed four (4) lot subdivision

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>836 Lake Avenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZONE</td>
<td>RA-4</td>
</tr>
<tr>
<td>LOT AREA</td>
<td>98.271 +/- acres</td>
</tr>
<tr>
<td>NUMBER OF CURRENT LOTS:</td>
<td>1</td>
</tr>
<tr>
<td>NUMBER OF LOTS PROPOSED:</td>
<td>4</td>
</tr>
<tr>
<td>LOT SIZE:</td>
<td></td>
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<tr>
<td>Lot #1 (for residential development)</td>
<td>4 acres</td>
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<tr>
<td>Lot #2 (for residential development)</td>
<td>4 acres</td>
</tr>
<tr>
<td>Lot #3 (to remain with Water Company)</td>
<td>18 +/- acres</td>
</tr>
<tr>
<td>OPEN SPACE</td>
<td>72.271 +/- acres (73.5% of the total lot area)</td>
</tr>
</tbody>
</table>

**APPLICATION SUMMARY:**
The Applicant is seeking Final Subdivision Approval to subdivide a 98.271 +/- acres parcel of land into four (4) lots. Two lots (Lots 1 and 2) would be 4-acres in size, and intended to be developed as residential parcels, one (1) parcel (Lot 3) would be 18 +/- acres and kept by the Aquarion Water Company for their continued use, and the last parcel (Lot 4) would be an open space parcel of 72.271 +/- acres located at 836 Lake Avenue in the RA-4 Zone.

**ISSUES/COMMENTS TO BE ADDRESSED:**
1) **ZONING** – Staff requests confirmation that proposed Lot 2 meet the Lot Frontage definition of Sec. 6-5(a)(35). In short, the applicant shall demonstrate that this lot maintains a 125 ft., width, undiminished for 150 feet from the street.
2) **CONSERVATION** – the Conservation Commission has issued comments dated 7/31/2020 in support of the application but note that if some slight modifications are made to the southern common boundary between Lots#1 and Lot #2 it could result in less disturbance of natural features.
3) **IWWA** - The applicant received IWWA approval at their July 27, 2020 meeting;
4) **HEALTH** – the Health Department has witnessed percolation tests, but has not received Septic Designs to confirm adequacy for sewage disposal facilities;
5) Open Space Deed Restriction documents should be submitted to Conservation and the Law Department for review and acceptance prior to be filed with any approved subdivision record sheet (aka Mylar).
6) If approved as a final subdivision or re-subdivision, the applicant should prepare a record sheet in a form suitable for the Chairman of the Planning and Zoning Commission to sign and file with the Greenwich Land Records, and the following notes shall be added:
   a. Any proposed change in the status of the Open Space area such as change in size
or ownership, and any change in the size of approved subdivision lots shall require submission of a revised plan and Declarations of Restrictions for review by the Conservation Department and approval by Planning and Zoning. The revised maps may require approval from the Commission as a re-subdivision and the Declaration may require amendments to reflect the changes.

b. Pursuant to Section 6-287, all subdivision lots shall be reviewed for compliance with Town drainage standards and a detailed drainage plan for each lot should be submitted to Planning & Zoning and DPW for review, prior to the issuance of any building permits. Drainage Maintenance Agreements may be required.

c. Any proposed blasting will require the preparation of a pre-blast survey.

d. Prior to issuance of a building permit for any lot, plans showing proposed house location, setbacks, driveways, accessory structures and uses, grading and drainage, erosion control plans, and protection measures for protecting trees to remain shall be submitted and approved by Planning and Zoning and Conservation for review.

7) Staff notes that, if approved, the applicant, prior to issuance of a Zoning Permit for any of these lots shall provide the following:

a. A soil and erosion control plan shall be developed for each lot including the location of silt fences, stockpile areas, tree protection/removal and the location of foundation dewatering controls.

b. In order to keep the disturbance to a minimum, none of the erosion/sedimentation controls shall be installed within the open space/ easement areas.

c. There shall be no earth disturbance, grade changes, removal of trees or issuance of any town permits until Planning and Zoning or its designee has reviewed and approved the S&E plans and confirms that all controls are properly in place in the field to avoid damage to natural resources during the construction period.

DEPARTMENT COMMENTS
ZEO -
CONSERVATION -
DPW - See attached
HEALTH - See attached

PROPOSAL:
The subject parcel is land that has been held by the Aquarion Water Company in their storage and delivery of drinking water to the Town. The 92+/- acres property is oversized for the RA-4 zone (where a four-acre minimum lot area is required) and is not served by Town sewer. The property is largely undeveloped, contains not only a lake, and watercourse, but wetlands, steep slopes and mature vegetation.

The proposed action would make four (4) parcels, where there is now only one (1). Two parcels would be 4-acres in sizes and are intended for residential development. The remaining acreage would be divided into a 72.271+/- acres deed restricted open space and
the remaining 18-acres would continue to be held by the Water Company for their use to provide water.

Hypothetical building and driveway designs have been provided which show a simplistic development of each proposed lot. The proposed drainage summary report has not been accepted by the Town’s Engineering Division.

In review of the proposed lot layout staff would like to point out to the Commission Lot #2. Per Sec. 6-5(a) (35) “Lot Frontage shall mean the distance between the side lines of a lot measured along the street which distance continues the minimum frontage as stated in Sec. 6-205 for the zone in which the lot is located undiminished to a depth equivalent to at least two hundred percent (200%) of the minimum front yard setback depth as stated in Sec. 6-205 for the zone in which the lot is located.” The RA-4 requirements are for a lot to have a 125 ft. frontage. The front yard setback is required to be 75 ft. Per this Section, the applicant will need to verify that Lot #2 is at least 125 ft. wide, and undiminished for at least 150 ft. from the street. If not, it would be considered a rear lot and the area between the road and the lot shape circle would be deducted from the zoning lot area.

**OPEN SPACE**
The areas proposed for open space would equal 72.271+/- acres in fee simple open space (735% of the total lot area in fee). This would far exceed the 15% maximum requirement of the Subdivision regulations. The areas designated for Open Space contain steep slopes, watercourses, wetlands, and Class III watershed lands. The State classifies land adjacent to and surround drinking sources, controlled by water companies, into classes. Aquarion is able to sell off Class III lands, but not Class I and II, in protection of water sources. This open space is the subject of a pending Municipal Improvement, endorsed by the Board of Selectman and the Director of Environmental Affairs, to acquire an access easement, with the Greenwich Land Trust, the contracted recipient of this open space, to allow the Town use and access of this land as a park/natural preserve, once transferred. The applicant should prepare a draft Open Space Deed Restrictions document for consideration of the Environmental Affairs Dept. and the Law Dept. and to be filed with any approved record sheet (Mylar) that may result for an approval of this application.

**CONSERVATION:**
Conservation staff endorses the proposal but noted some slight modifications to the southern common boundary between Lots#1 and Lot #2 could result in the driveway being shifted further east, lessening the slope, possible preserving more trees and eliminating the first intrusion into the wetland area. They also note that orientation of the proposed homes could reduce grading. However, these homes are hypothetical, so the actual development of the lot would be known unless the lots are approved and “real” construction plans area provided. Typically, the Conservation Commission holds a hearing on subdivisions involving 10 or more acres of land. However, the Conservation
Commission is discussing if they intend to have a meeting to issue comments on this proposal or if they intend to issue their comments and/or recommendations through staff.

ENGINEERING AND DRAINAGE:
The Engineering Division has reviewed the proposal and noted revisions and/or additional information prior to Subdivision Approval. The applicant has indicated that they are working to address, but it may not be addressed and/or reviewed by DPW by the Commission’s meeting of 8/4/2020.

HEALTH:
The proposed parcels would have to be serviced by septic systems as the parcel is outside of the Town’s Sewer Benefit Area. Comments from the Health Department were received and they note that percolation tests have been witnessed by the department, but no applications have been made to their department to review code compliant septic plans. The applicant will need to comply with Sec. 6-271 (b) of the Town’s Subdivision Regulations and demonstrate that adequate sewage disposal facilities can exist on the lots to be residential properties.

IWWA
The IWWA granted conceptual approval for the subdivision plan at their July 27, 2020 meeting. The decisions of that meeting have not been posted but their approval has been confirmed in conversation with the Director of Environmental Affairs.

BACKGROUND
The land is presently owned by Aquarion Water Company of Connecticut, it consists of Class I, II & III Lands in the Watershed Area (classifications to describe lands in and around public water supplies). Portions of the property appears to have been owned by Aquarion Water Company (and its predecessors) going back to as early as 1897. The current parcel appears to have been created by a series of acquisitions through the 1920's. Although title holder’s names have changed it appears that this land has been controlled by a water company, since that time.

The chain of title and deed history, submitted by the applicant, details the history of the parcel and the chain of title over the past 100+ years.

APPLICABLE ZONING REGULATIONS
Subdivision Regulations: Sections 6-261, 6-266, 6-268 thru 6-273, 6-275, 6-287 and 6-297
Building Zone Regulations: Sections. 6-5, 6-93 and 6-205,
DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION
SITE DEVELOPMENT REVIEW

Engineering Project No. 20-4(5)  Department Project No. PLPZ202000192  Submittal Received Date: 7/7/2020

Submittal Reviewed For: Planning and Zoning  Traffic Review Requested: No  Review Type: Final Subdivision

PLAN SET INFORMATION

Plan Title: 4 Lot Residential Subdivision  Project Address: 836 Lake Avenue

Engineering Firm: Dymar Corp.  Original Plan Date: 6/19/2020  Latest Plan Revision Date: 6/24/2020

DRAINAGE SUMMARY REPORT INFORMATION

Engineering Firm: Luchs Consulting Engineers  Original Report Date: 6/24/2020  Latest Report Revision Date: ____

Reviews provided by the Engineering Division are for compliance with the Town’s “Roadway Design Manual and Standard Construction Details” and “Drainage Manual” as amended. Reviews are based upon the information and plans provided. Comments pertaining to the Town’s manuals are not all encompassing. Other reviewing entities may provide additional comments regarding consistency with these manuals in accordance with their jurisdictions. Review of sanitary sewer and septic systems are not reviewed by the Engineering Division.

All New Submittals for Commission Meetings must be received by the Engineering Division four weeks before scheduled Commission Meeting.

All Revised Submittals for Commission Meetings must be received by the Engineering Division three weeks before scheduled Commission Meeting.

Reviewed and Approved by: _______________________________ Date: 7/24/20

Scott Marucci - Senior Civil Engineer

COMMENTS AND CONDITIONS OF APPROVAL: Resubmit Prior to Final Subdivision Approval

1. The following notes shall be added to the subdivision map:
   a. Upon approval of this subdivision plan, the owners agree with the Town that unless otherwise specified hereon, the areas within at least ten (10) feet of the centerline of any drainage facility (20 feet total), ditch or stream shown hereon are dedicated for drainage, that no building or other structure shall be located thereon and that the Town shall not be under any obligation to maintain, clean, enclose or otherwise alter or improve, such drainage facility. However, any drainage line, ditch, or stream, whether or not depicted hereon and not within an established easement, may be relocated by owner with prior approval of the Inland Wetlands & Watercourses Agency.
   b. The grantee of any parcel having a watercourse agrees to maintain the watercourse so as to permit the free flowing of water therein, after obtaining approval for the required work from the Inland Wetlands & Watercourses Agency. If any grantee fails to maintain the watercourse the Town of Greenwich shall have the privilege of entering upon the property to perform the required work and the cost thereof shall be paid by the owner of the parcel in default.
   c. The drainage design for each parcel shall meet the standards of the Town of Greenwich Drainage Manual in effect at the time a building permit application is submitted. The full standards of the Town of Greenwich Drainage Manual shall be met. No waivers or exceptions will be granted for any of the standards.
d. Development of each parcel shall require submission of a Drainage Summary Report along with Construction Plans for review by Planning and Zoning and DPW-Engineering Division prior to issuance of a building permit.

e. If the runoff from any of the site’s cause an icing condition on the road, modifications to the site’s stormwater BMPs and stormwater/groundwater controls will be required to correct the icing condition.

1. A revised Form SC-100 needs to be submitted.
2. Form SC-107 needs to be submitted for each lot.
3. The Drainage Summary Report needs the following revisions and additional information submitted:
   a. The comparison table must include the existing and proposed peak flow (cfs), volumes (acres or cubic feet), and the difference and percent difference for the 1, 2, 5, 10, 25, 50, and 100-year storms for each point of concern.
   c. The Custom Soils Resource Report needs to include a table that includes the Soil Group (A, B, C, D).
   d. The existing conditions watersheds need to include the following:
      i. Three points of concern must be included in the analysis.
         1. Lot 1 – Watershed 1 at the property line with the open space parcel.
         2. Lot 2 – Watershed 2S at the property line with Lot 1.
         3. Lot 2 – Watershed 2N at the property line with the open space parcel.
         4. The watershed map must callout the three points of concern.
      ii. The watershed map must show the Tc path for each of the watersheds.
      iii. The property lines for Lot 1 and Lot 2 must be shown.
   e. The proposed conditions with no BMPs need to include the following:
      i. This analysis is not required but can be included.
      ii. Three points of concern must be included in the analysis.
         1. Lot 1 – Watershed 1 at the property line with the open space parcel.
         2. Lot 2 – Watershed 2SA at the property line with Lot 1.
         3. Lot 2 – Watershed 2SB should be broken into two watersheds one to same point of concern as 2SA and one to the same as 2NA.
         4. Lot 2 – Watershed 2NA at the property line with the open space parcel.
         5. Lot 2 – Watershed 2NB at the property line with the open space parcel.
         6. The watershed map must callout the three points of concern.
      iii. The watershed map must show the Tc path for each of the watersheds.
      iv. The property lines for Lot 1 and Lot 2 must be shown.
   f. The proposed conditions with BMPs need to include the following:
      i. A detailed watershed map for Lot 1 and Lot 2 needs to be included.
      ii. Each watershed boundary for the area directed to each BMP must be included (must include other areas that drain onto or into the BMP).
      iii. Three points of concern must be included in the analysis.
         1. Lot 1 – The property line with the open space parcel.
         2. Lot 2 – The property line with Lot 1.
         3. Lot 2 – The property line with the open space parcel.
         4. The watershed map must callout the three points of concern.
      iv. The watershed map must show the Tc path for each of the watersheds (Tc path not needed for watersheds with short direct discharges to BMPs).
      v. The property lines for Lot 1 and Lot 2 must be shown.
   g. The HydroCad analysis needs to be revised to include the three points of concern.
   h. The HydroCad analysis must use a minimum time span of 0-24 Hrs. for existing and proposed conditions.
   i. The HydroCad analysis uses a curve number of 92 for a wooded wetland. How was this curve number determined?
   j. The HydroCad analysis shall use a maximum sheet flow length of 100-feet.
   k. The HydroCad analysis must use square feet for areas and cubic feet for volumes.
   l. The HydroCad analysis must include the Stage-Area-Storage Tables for each of the BMP’s. This is required to verify the storage provided at the outlet elevation of each BMP.
   m. The use of an exfiltration rate within the HydroCad analysis must follow the requirements of Appendix B in Town of Greenwich Drainage Manual February 2012. Please contact the Engineering Division to discuss
what is required. To use an exfiltration rate in the analysis a saturated hydraulic conductivity test must be completed in the proposed location of each BMP.

n. Need to discuss the rain garden storage tables.
   i. A minimum 3” mulch layer needs to be in the analysis (10% void ratio can be used).
   ii. The bioretention soil must be a minimum of 18-inches (30% void ratio can be used).
   iii. A stone storage layer below the bioretention soil can be included.
   iv. Any design with an underdrain can only be considered a filtration BMP and no credit for infiltration can be taken.

o. The WQV computations must include the entire area that is directed to each BMP. Review and revise the WQV computations for each watershed area as needed.
p. The WQV must be calculated for each area directed to a BMP. All imperious areas must be directed to a BMP.

q. The RRV computations must use the values generated in the detailed HydroCad analysis and not the proposed HydroCad with no BMPs.
   i. Proposed RRV for Lot 1: 1A + 1B + 1C + 1D + 1E = .112 + .018 + .010 + .010 + .018 = .168 AC-FT = 7,318 CF and not .126 AC-FT.
   ii. Proposed RRV for Lot 2: 2NA + 2NA1 + 2NA2 + 2NA3 + 2NA4 + 2NB + 2NB1 + 2NB2 + 2SA + 2SA2 + 2SB + 2SB2 + 2SB3 = .045 + .002 + .007 + .029 + .020 + .015 + .018 + .006 + .025 + .013 + .024 + .016 + .002 = .222 AC-FT = 9,760 CF and not .159 AC-FT.
   iii. Lot 1 required RRV is 7,318 – 4,051 = 3,267 CF. This must be provided in the BMPs during the 1-year storm.
   iv. Lot 2 required RRV is 9,670 – 5,663 = 4,007 CF. This must be provided in the BMPs during the 1-year storm.

r. Review and revise all other computations as needed.
s. The conveyance computations and outlet protection computations must be submitted prior to building permit.

4. The construction plan set was not reviewed in detail at this time. The following information must be added to the plans:

a. Existing Conditions Survey Sheet
   i. Show a note certifying the survey A-2.
   ii. Show a note certifying the survey T-2.
   iii. Show one (1) permanent benchmark on the site within one hundred feet of the proposed construction.

b. Site Plan Sheets (Submitted Lot 1 and Lot 2 Grading, Drainage & Utility)
   i. Show excavation and fill quantities in a table.
   ii. Show the entire pipe network from the starting point (roof leaders, catch basin, etc.) to the outfall.
   iii. Show the footing drain network from the house/sump pump to the outfall.
   iv. Show top and bottom elevations for all retaining walls and stone fences.
   v. Show all catch basins/yard drains/drain inlets with the following in the callout:
      1. Grate elevation.
      2. Filter insert name and model # (if applicable).
      3. Invert elevation of each pipe.
      4. Pipe location in structure (n, s, e, w, etc.).
      5. Pipe size.
      6. Sump elevation.
   vi. Show all manholes/junction boxes with the following in the callout:
      1. Cover elevation.
      2. Invert elevation of each pipe.
      3. Pipe location in structure (n, s, e, w, etc.).
      4. Pipe size.
      5. Bottom of structure elevation.
   vii. Show all control structures with the following in the callout:
      1. Cover/grate elevation.
      2. Invert elevation of each pipe.
      3. Control structure type and size (orifice, rectangular weir, v-notch weir, etc.).
      4. Pipe location in structure (n, s, e, w, etc.).
DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION
SITE DEVELOPMENT REVIEW

5. Pipe size.
viii. Show all pipes with the following in the callout:
1. Pipe size.
2. Pipe material.
3. Pipe slope.
ix. Show all level spreaders/scour holes’/riprap aprons with the following in the callout:
1. Dimensions (length and width).
2. Depth of stone.
3. Pipe/stone elevation.
4. Pipe size.
5. Pipe material.
x. Show all bioretention (rain gardens) with contours (1/2 foot if needed) and include the following in the callout:
1. Top of berm elevation and surface area.
2. Top of mulch/sod elevation and surface area.
3. Top of bioretention soil mix elevation and surface area.
4. Bottom of bioretention soil mix elevation and surface area.
5. Bottom of stone elevation and surface area.
6. Overflow/weir elevation and dimensions.
7. Underdrain/outlet pipe sizes, material, and invert elevations.
xii. Show all permeable pavements with the following in the callout:
1. Permeable surface type (unilock eco-pavers, porous asphalt, gravel pave 2, etc.).
2. Permeable Pavement surface thickness.
3. Permeable Pavement surface area.
4. Bottom of no. 8 stone elevation.
5. Bottom of no.57 stone elevation.
6. Bottom of no.2 stone elevation.
7. Underdrain/outlet pipe sizes, material, and invert elevations.
xiii. Show all wet and dry water quality swales with contours (1/2 foot if needed) and include the following in the callout:
1. Top of swale elevation and width.
2. Bottom of swale elevation and width.
3. Top of check dam elevation and width.
4. Length between check dams.
5. Outlet pipe sizes, material, and invert Elevations.
c. Driveway Profile & Sight Distance Sheet
i. The proposed driveway for Lot 1 requires the removal of vegetation in both directions to meet the required 150-foot sight distance. Revise the plans showing the minimum required 150-foot sight distance and callout all the vegetation and trees that need to be removed. A letter from the Tree Warden for the removal of all the vegetation and trees within the 150-foot sight line must be submitted prior to final subdivision approval from P&Z.

ii. The proposed driveway for Lot 2 requires the removal of vegetation in both directions to meet the required 150-foot sight distance. Revise the plans showing the minimum required 150-foot sight distance and callout all the vegetation and trees that need to be removed. A letter from the Tree Warden for the removal of all the vegetation and trees within the 150-foot sight line must be submitted prior to final subdivision approval from P&Z.

iii. Show width of driveways at property line.
iv. Show width of driveways at edge of road.

v. The profile for the driveway on Lot 2 must be from the edge of road to turn around and also to the garage. The profile shall include slopes, spot elevations and if porous pavement is used the entire porous pavement section to the bottom of stone shall be included with elevations.

vi. A profile for the driveway on Lot 1 from edge of road to garage must be submitted. The profile shall include slopes, spot elevations and if porous pavement is used the entire porous pavement section to the bottom of stone shall be included with elevations.

vii. Show slope of driveways for first five feet on profile (required minimum slope is +3% to 6%).

viii. Show slope of driveways for next twenty feet on profile (required maximum slope is 4% when remaining slope ≥ 10%).

ix. Show slope of driveways for the remaining distance to garage on profile (required maximum slope is 8% for commercial, 12% residential (two or more family), and 15% for residential).

d. Construction Details Sheets
   i. Need to discuss the Permeable Paver System Detail with the Engineering Division. A copy of the specification for ASTM #9 stone must be submitted.
   ii. Need to discuss the Type ‘A’ and ‘B’ Rain Garden Details. The bioretention soil specification must be on the plans. The bioretention soil mix must be the specification listed in Appendix G of the Town of Greenwich Drainage Manual February 2012 as amended. All residential rain gardens must have a minimum 18-inches of bioretention soil used.

e. Building/House Section or Elevation Sheet (required prior to zoning/building permit sign-off)
   i. Show one section or elevation of the building/house.
   ii. Show all elevations to the deepest footings on section/elevation.
   iii. Show existing and proposed grade elevation on section/elevation.
   iv. Show existing mottling elevation on section/elevation.
   v. Show existing groundwater elevation on section/elevation.
   vi. Show existing ledge elevation on section/elevation.
   vii. Sheet shall be sealed and signed by a State of Connecticut Professional Engineer or Architect.

5. The Operations and Maintenance Plan Report must be a separate document for each lot and include the following:
   b. Exhibit A: Long-term Maintenance Plan that prescribes those activities that must be carried out to maintain compliance with this Declaration. A maintenance log form must also be included. A draft must be completed prior to Final Site Plan Approval. The final version must be submitted with the request for Certificate of Occupancy.
   c. Exhibit B: Improvement Location Survey showing a location of the Property and an accurate location of each stormwater management practice affected by this Declaration. This must be submitted prior to the issuance of the Certificate of Occupancy.
   d. The Maintenance Declaration will need to be filed on the Town of Greenwich Land Records prior to a Certificate of Occupancy. A review of the documents above must be completed before filing on the Town of Greenwich Land Records.

**Standard Conditions for Each Submittal**

1. The Engineering Division will no longer keep any records for the submittals. All records for the submittal shall be obtained from the Town of Greenwich Department/Division that has taken in applications and/or submittals. These documents are maintained within each office (e.g. P&Z, IWWA, and DPW Building and Highway Divisions).

2. All revisions to the reports and plans must follow the requirements in the Town of Greenwich Drainage Manual February 2014 as amended.

3. All revisions must be accompanied by a point-by-point written response to the Engineering Division’s comments.

**Standard Conditions of Approval**

1. The Operations and Maintenance Plan Report must include the following for the Certificate of Occupancy:
   b. The final completed Exhibit A, and B
c. The Maintenance Declaration needs to be filed on the Town of Greenwich Land Records prior to a Certificate of Occupancy. A review of the documents above must be completed before filing on the Town of Greenwich Land Records.

2. The Town of Greenwich – Standard Construction Notes for Site and Subdivision Plans are conditions that must be met.

3. All requests for a Temporary Certificate of Occupancy (T.C.O.) or a Certificate of Occupancy (C.O.) shall be submitted one month before the T.C.O. or C.O. is required.

4. The submittal for a Temporary or Final Certificate of Occupancy must include the following:
   c. Field Inspection Record (All required photos) – Form SC-106 – Sealed and Signed by a Connecticut Licensed Professional Engineer.
   d. Bioretention Soil Testing Certification Sign-Off (as applicable with the bioretention soil gradation test and the phosphorous test for the mixed soil) – Form SC-104 – Sealed and Signed by a Connecticut Licensed Professional Engineer.
   h. A Letter discussing all the work that remains to be completed (Only for a Temporary Certificate of Occupancy Submittal).
MEMORANDUM

TO: Patrick LaRow, Deputy Director, P & Z / Assistant Town Planner
FROM: Aleksandra Moch, Environmental Analyst
DATE: July 31, 2020
RE: Aquarion Water Company of Connecticut, 836 Lake Avenue, PLPZ 202000192
Site plan by DYMAR, dated June 19, 2020, landscape plan by William Kenny & Associates, Inc., dated July 1, 2020

I have reviewed the above-referenced plan and visited the site. The following comments are offered for your consideration:

1. The proposed four-lot subdivision is associated with preservation of 72 acres of land and the retention of another 20 acres of Class I and II watershed land by the applicant. Two of the lots are designated for the single-family development. They are located off Cherry Valley Road within an area containing the most upland and easy access to the road.

   The Commission supports the overall application and has partnered with the applicant and Greenwich Land Trust to structure a deal to preserve the 72 acres and have that open space be publicly accessible for passive recreation. The two proposed lots are located in an area of the site that has the least amount of ecological value and will not meaningfully degrade the higher valued land to the east. Additionally, the location of the lots along the western boundary best ensures the privacy of those lots and a positive experience for the future users of the open space.

2. The site’s constraints, including steep slope and shallow ledge, are further challenged by the presence of wetlands and watercourses. Lot 1 has no wetland crossings and Lot 2 shows three of them. On July 27, 2020, the IWWA approved the two lots.

   The boundary line between the residential lots forces the driveway on Lot 2 northwestward, causing direct wetland impacts, increased grading on steeper slopes, and a loss of trees. If the boundary between the lots is rotated towards the south and made into a straighter line, it will allow the driveway to shift slightly east. This shift will facilitate a gentler approach, preserve more trees, and eliminate the first wetland intrusion.
Further, site redesign should consider reorienting the residence on Lot 2 west-east and move the swimming pool behind the residence. This revision not only will shorten the driveway, but it would also provide for a more level backyard and require less grading and site clearing.

3. The proposed landscape plan offers protection and restoration of the wetland/watercourse and buffer habitat but provides no details for the maintenance of the other upland areas. The designated landscape envelopes enclosing the non-regulated areas are large and show a sparse tree coverage. This extensive area, if maintained as lawn, will not only have a negative effect on the lost woodland habitat, but it would lead to degradation of the natural communities of fauna and flora over more than 3 acres of the developed land. It is recommended, the applicant sets identifies areas which will serve as upland habitat either through preserved wooded sections and/or restored native meadows.

cc: Conservation Commission
Long, Michael <Michael.Long@greenwichct.org>
Fri 7/10/2020 1:16 PM
To: Dygert, Bianca <bianca.dygert@greenwichct.org>
Any residences constructed on these lots would need private septic systems and wells. The health department has witnessed soil testing on lots 1 and 2 but no plans have been submitted as yet for review

Michael Long
Greenwich Health Department

From: Dygert, Bianca
Sent: Monday, July 6, 2020 3:59 PM
To: Marucci, Scott <Scott.Marucci@greenwichct.org>; Couture, Jodi <jodi.couture@greenwichct.org>; Moch, Aleksandra <Aleksandra.Moch@greenwichct.org>; Sesto, Patricia <patricia.sesto@greenwichct.org>; Long, Michael <Michael.Long@greenwichct.org>; Wetmore, John <John.Wetmore@greenwichct.org>
Subject: ROUTING - 836 Lake Avenue - PLPZ 2020 00192 - Final Subdivision

Hello All,

Please find attached routing sheet and application material at the link below for a Final Subdivision for 836 Lake Avenue.

https://greenwichct-my.sharepoint.com/:f:/g/personal/katie_deluca_greenwichct_org/EuhcBrwCnCzdcfRYAqgBFU4PPc78K8uCdOnaOvik6e?e=YZy4H

Please let me know if you have any comments on this application.
Thank you,

Bianca Dygert
Planner II

Town of Greenwich
Land Use - Planning & Zoning
101 Field Point Road
Greenwich, CT 06830-6463
Ph. (203) 622-7894
Office Fax. (203) 622-3795
Direct Fax. (203) 861-6113
Bianca.Dygert@greenwichct.org

www.greenwichct.gov
SUBDIVISION APPLICATION

Project Name: Subdivision of 836 Lake Avenue, Greenwich, CT

Project Address: 836 Lake Avenue, Greenwich, CT

Property Owner(s): Aquarion Water Company of Connecticut

Tax Account Number(s): 10-1255 Zone(s): RA-4 Lot Area: 98.271+/- acres

Please select all relevant items below:

☑ Preliminary
☑ Subdivision
☐ Coastal
☐ Resubdivision
☑ Final

No. of Lots: 1

Existing: 1

 Proposed: 4 (2 residential * & 2 non-buildable)

Total Area of Property (s.f. or acres): 98.271+/- acres *

Area of Land Reservation: 72.271+/- acres

☐ Property is within 500 feet of a Municipal Boundary of ___________ (for notification)

☑ 10 lots or 10 or more acres requires Environmental Assessment § 6-266 (19)

Reserved Land Area as Percent of Total Land Area: 73.5%

Previous SB #: N/A

GLR Map # of any previously filed subdivisions or surveys: N/A

Check as applicable: ☑ septic ☑ well ☐ sewer ☐ public water

Health Permit needed and received? TBD

IWWA Permit received? Pending IWWA Permit #: Pending

To be completed by P&Z staff only:

Check # ___________ Check Amount: $_________

Application #: ________________________________

PZ Subdivision App 2018
Final Subdivision Application Checklist
(Per Section 6-267 through 6-272 of the Subdivision Regulations)

APPLICATION NAME: 836 Lake Avenue, Greenwich, CT

All requests for final subdivision review by the Planning and Zoning Commission shall include all information indicated on this checklist and confirmation that all modifications as specified in a Commission review of any preliminary plan have been resolved. Applications shall be submitted in a single submission, including a list of submitted plans and a project narrative. The subdivision plan record sheet and construction sheet(s) are to be prepared in accordance with the Town’s subdivision regulations and Department of Public Works Roadway and Drainage Design Manuals. A complete application must be received a minimum of 30 days prior to the Commission meeting at which the applicant desires to be heard. Fifteen copies of the plans are to be submitted (up to 20 copies of the plans may be required if in Coastal Zone or including new roads). Plans must be folded to 9”x12”.

Check Items Submitted:

1. Record Sheets: shall be drawn at a scale of 20, 40, 50 feet to 1 inch except that for tracts in the RA-1, RA-2 or RA-4 zones a scale of 100 feet to 1 inch may be used provided required data is clearly shown. An index is to be provided in the event multiple sheets are required.

   a. Title (Subdivision or Resubdivision) of the sheet including the name of the subdivider and/or contract purchaser, Town Project Number issued upon request by the Chief of the Engineering Division of the Department of Public Works and endorsement block for Commission signature in the lower right hand corner of the tracing. A graphic scale, north arrow, and drawing and revision date(s) are to be shown.

   b. The location and dimensions of all boundary lines (metes and bounds) of the property.

   c. The dimensions and areas of all existing and proposed lots.

   d. Information to show the location of the subdivision in relation to surrounding property and streets.

   e. The names of owners of adjacent land (including properties across the street) or names of adjacent subdivisions; and locations of structures, wells, and septic tanks on adjacent properties within 100 feet of the proposed subdivision.

   f. The lines of existing and proposed streets within the subdivision and lines of existing or approved streets. Survey data shall be shown across all street intersections to relate accurately one block with another and one side of a street with the opposite side.

   g. Location and type of all proposed monuments.

   h. The names of existing and proposed streets. The names of proposed streets are to be unique within the Town and not easily confused with names of other accepted streets.

   i. The lines and purposes of existing and proposed easements immediately adjoining and within the subdivision.

   j. The location of all existing and proposed water bodies, streams and wetlands.

   k. The location and dimension of all property proposed to be set aside for park and playground use or other public or private reservations with designation of the purposes thereof.

   l. The location of any Town and zone boundary lines within and adjoining the tract; and yard dimensions in respect to existing buildings.

   m. Sufficient data acceptable to the Engineering Division, to determine readily the location, bearing and length of all street lines, and to reproduce such lines upon the ground. These should be tied to reference points previously established such as State Highway or Town lines, adjacent subdivision monuments, or Town or State established grid points, and shown on the map. Datum used shall also be indicated.

   n. Certification with date, signature and seal of a registered land surveyor that the drawing is substantially correct to an A-2 degree of accuracy and that the property is in a designated zone or zones under the zoning regulations and a statement as to whether or not the lots in the proposed subdivision comply with zoning regulations.

   o. The following note shall be placed on the record sheet for any subdivision with a defined drainage course, swale or structure: “Upon approval of this subdivision plan, the owner agrees with the Town that unless otherwise specified hereon, the areas within at least ten (10) feet of the center line of any drainage facility, ditch or stream shown hereon, are dedicated for drainage, that no building or other structure shall be located thereon and that the Town shall not be under any obligation to maintain, clean, enclose, or otherwise alter or improve, such drainage facility.”
Final Subdivision Application Checklist

p. The endorsement block for Commission action required to appear on the record sheet shall be shown as follows:
   *Approved by Resolution of the Planning and Zoning Commission, Town of Greenwich, Connecticut, dated

______________________________
Signature of Chairman
______________________________
Date

q. A note indicating the type of sewage disposal and water supply facilities to be provided.

r. The following information is to be shown on the record sheet as applicable: total area of the subdivision, area of land reservations, area of land reservations as a percentage of total area, area of conservation land reserved by easement.

s. The record sheet shall note the elevation and the extent of the 100 year flood boundary as shown on the current edition of the Flood Insurance Rate Maps; NGVD 1929 is to be used. Areas reserved for flooding, as per the drainage summary report, shall be indicated and the flood elevation noted. A note indicating the purposes of the reservation shall be shown.

t. All notes required for the preliminary layout not mentioned herein are required.

u. A note stating that all utilities shall be placed underground.

2. An affidavit certifying that all abutting property owners have been notified about the proposed subdivision (See Section 6-272 of the Subdivision Regulations). Owners of lots, or portions of lots, which are across a public or private street shall be deemed to be abutting property owners. A schedule of names, addresses, shown on a GIS map with lot lines indicating the location of the notified property owners.

3. Written authorization for the agent to act on behalf of the certified property owner(s).

☐ 4. Eight copies of 11 x 17 inch reduction.

☐ 5. A map at a scale of 1,000 feet to one inch showing the Lot Lines & Streets.

☐ 6. Two copies of declarations or easements relating to reservations for park and playground or conservation areas prepared in accordance with the Town's model documents.

☐ 7. Fee submitted at time of application: $________________ (see fee schedule)

☐ 8. Eight copies of a completed application form.

9. All items from the Preliminary Subdivision checklist.

* To be provided with hard copy of application materials

"It is the belief of the PZC staff that this application is incomplete because of the failure of the applicant to provide the materials referred to above. This application will be reviewed by the PZC and a decision made as to whether it is complete or incomplete at its public meeting to be held in the PZC office."

I certify that the application includes all of the above requirements as noted. Please explain reasons for any omissions.

Additional materials to be provided with hard copy of application materials.

Owner name/ signature ____________________________

Agent name / signature ____________________________ Date ____________

P&Z Staff Signature ____________________________ Date ____________

Applicant Comments:

______________________________

NOTE: Any new documentation presented at Planning and Zoning Meetings shall be submitted to staff so that they can be made part of the record. Please ensure all documents can easily be removed from presentation boards.
June 17, 2020

Katie DeLuca, AICP
Director of Planning and Zoning
Town Hall, Planning and Zoning Department
101 Field Point Road, 2nd Floor
Greenwich, CT 06830

Ms. Patricia Sesto
Director of Environmental Affairs
Town Hall
101 Field Point Road, 2nd Floor
Greenwich, CT 06830

RE: 836 Lake Avenue, Greenwich, Connecticut
Aquarion Water Company of Connecticut
Letter of Authority

Dear Ms. DeLuca:

On behalf of Aquarion Water Company of Connecticut, the owner of 836 Lake Avenue, Greenwich, CT (the “Property”), I hereby authorize the attorneys of Carmody Torrance Sandak & Hennessey, LLP, with offices located at 707 Summer Street, Stamford, Connecticut 06901, to act as agent for Aquarion Water Company of Connecticut in connection with the enclosed land use applications. Thank you for your acknowledgement of said authority.

Sincerely,

[Signature]

Elizabeth Camerino-Schultz
Real Estate Consultant
STATE OF CONNECTICUT
COUNTY OF FAIRFIELD

AFFIDAVIT

I, Jason A. Klein, understand the obligations of an oath and swear that this statement is true to the best of my knowledge.

1. I am over eighteen (18) years of age and understand the obligations of an oath.

2. I submit this Affidavit pursuant to and in satisfaction of the requirements established by the Subdivision Regulations of the Town of Greenwich, CT;

3. Aquarion Water Company of Connecticut, Inc. has filed Preliminary and Final Subdivision Applications with the Planning and Zoning Commission of the Town of Greenwich seeking subdivision approval for 836 Lake Avenue, Greenwich, CT (the "Property").

4. Notice of the filing of these applications was mailed to abutting property owners and owners of property across the street from the Property on July 2, 2020 via Certificate of Mailing.

5. A copy of the letter sent to neighboring property owners is attached hereto as Schedule A.

6. A copy of the Certificates of Mailing is attached hereto as Schedule B.

Dated at Stamford, Connecticut, this 2nd day of July, 2020.

[Signature]

Jason A. Klein

Subscribed and sworn to before me on this 2nd day of July, 2020.

[Signature]

Notary Public

BRIANNA D. REGENTZ
NOTARY PUBLIC
MY COMMISSION EXPIRES FEB. 28, 2025
July 2, 2020

RE: Subdivision of 836 Lake Avenue, Greenwich, Connecticut
Aquarion Water Company of Connecticut
Notice of Filing of Preliminary & Final Subdivision Applications

Dear Neighboring Property Owner:

Our firm represents Aquarion Water Company of Connecticut ("Aquarion"), owner of property known as 836 Lake Avenue, Greenwich, Connecticut (the "Property"). The Property is approximately 98.271+/- acres and is located in the RA-4 (4 Acre Residence) Zone.

I am writing to inform you that Aquarion has filed applications with the Town of Greenwich Planning and Zoning Commission seeking Preliminary and Final Subdivision Approvals (the "Applications") to subdivide the Property into four (4) lots. Lots 1 and 2 (the "Residential Lots") will contain approximately four (4) acres each and are designed for single-family residential use in accordance with the standards of the RA-4 Zone. The third lot is proposed to be 72.271+/- acres and will be preserved as open space. The last lot will be retained by Aquarion for continued use by Aquarion and contains 18+/- acres.

The Applications will facilitate the future construction of a single-family home and accessory residential improvements on both Residential Lots, which will be located in the southwest portion of the Property along Cherry Valley Road. A sketch showing the approximate location of the proposed lots, is enclosed for your reference.

Please feel free to contact me if you have any questions regarding this application, or Elizabeth Camerino-Shultz of Aquarion (203-336-7632). Alternatively, you may also contact the Planning and Zoning office at 203-622-7894 for information concerning this application.

Sincerely,

Jacqueline O. Kaufman

Jacqueline O. Kaufman
Proposed Four (4) Lot Subdivision
Illustrative Location Plan
6.19.2020
Schedule B
Edward Reboy
857 Lake Avenue
Greenwich, CT 06830

Carmody Law
707 Summer Street, 3rd Floor
Stamford, CT 06901

Cheryl Rona LaCoff
881 Lake Ave
Greenwich, CT 06831

Tal Michael Wei-Kwan &
Muneca I W/S
8 Paddock Drive
Greenwich, CT 06831

Lawrence Audicara &
W/S
839 Lake Avenue
Greenwich, CT 06831

James & Mary Ann Farrell
15 Paddock Drive
Greenwich, CT 06831

Lawrence Antin
839 Lake Ave
Greenwich, CT 06831

914 Lake Ave Assoc.
105 Fifth Ave SD
New York, NY 10003

Louie Lehman
64-A Cherry Valley Rd.
Greenwich, CT 06831

Lawrence, O'Connell
48 Burying Hill Rd.
Greenwich, CT 06831

914 Lake Ave Assoc.
105 Fifth Ave SD
New York, NY 10003

Alyssa Stafford
101 Old Mill Rd
Greenwich, CT 06831

CT Light and Power
PO Box 270
Hartford, CT 06101

Old Mill Property LLC
103 Old Mill Rd
Greenwich, CT 06831

Assay Baggerz & Kite W/S
69 Old Mill Road North
Greenwich, CT 06831

Old Mill Properties LLC
6 Cherry Valley Rd
Greenwich, CT 06831

Thomas W. Ladd Jr.
70 Old Mill Road North
Greenwich, CT 06830

Matthew R. Vail, P.E.
Transportation Principal Engineer
2800 Berlin Turnpike
PO Box 317565
Newington, CT 06131-7565

Jodi Specker, Lynne Abramson
15 Bayberry Lane
Greenwich, CT 06831

Steven Bracvic & Deluno
Eliot W/S
69 Old Mill Road North
Greenwich, CT 06831-7047

Babcock Park and Playground
Lake Ave
Greenwich, CT 06831

carmdylaw.com
Edward Rasboy & Yvonne W/S
857 Lake Avenue
Greenwich, CT 06831

Old Mill Properties LLC
C/O Amelia
16 Cherry Valley Rd
Greenwich, CT 06830

Town Of Greenwich
Bushwook Property
101 Field Point Rd
Greenwich, CT 06830

John B Lamb & Grace W/S
20 Cherry Valley Road
Greenwich, CT 06830

Donna Castronovo
881 Lake Avenue
Greenwich, CT 06831

Bayberry Park Corp
Bayberry Lane
Greenwich, CT 06830

Tong Wu & Kevin Wang
887 Lake Avenue
Greenwich, CT 06831

Boris Mitzben Tr & Stano Angelina Tr
851 Lake Avenue
Greenwich, CT 06831

Sexton Block Holdings LLC
51 Cherry Valley Road
Greenwich, CT 06831

Natalie Embiricos
15 E Putnam Ave #387
Greenwich, CT 06830

Tom S Ward Jr Tr 70 Old Mill Road No
70 Old Mill Road
Greenwich, CT 06830

Seth Ruthen
895 Lake Avenue
Greenwich, CT 06831

Edward L Milstein &
42 Bayberry Hill Rd
Greenwich, CT 06831

Greenwich Lake Avenue Properties
881 Lake Avenue
Greenwich, CT 06831

Aquacore Water Company
Of 600 Lindsey Street
Bridgewater, CT 06606

Michele Epperson
900 Lake Avenue
Greenwich, CT 06831

Thomas E Henry &
Patrica E W/S
11 Underwood Road
Forest Hills, NY 11375

Stevens Banier & Delarosa
Elina W/S
69 Old Mill Road
Greenwich, CT 06831-3047

Gilbert Van Hasset &
44 Cherry Valley Rd
Greenwich, CT 06831-0000

Amp Bagaria & Kila W/S
68 Old Mill Road
Greenwich, CT 06831

Marisa Santa Cruz
21 Cherry Valley Rd
Greenwich, CT 06830

Lawrence C Lieberts &
865 Lake Ave
Greenwich, CT 06830

Jefie Scheherezade
11 Bayberry Lane
Greenwich, CT 06831

Milstein Edward
335 Madison Avenue
New York, NY 10017

Sahniwik Dilak Ashitan
897 Lake Ave
Greenwich, CT 06830

Gray W Hampton III &
Lauren W/S
891 Lake Avenue
Greenwich, CT 06831

Susan P Carroll Tr
9 Bayberry Lane
Greenwich, CT 06831

869 Lake LLC
40 West Elm Street
Greenwich, CT 06830

Lawrence Auriana &
Irene Auriana W/S
839 Lake Ave
Greenwich, CT 06831

Ralph C Roe II & Stacy W
W/S
40 Cherry Valley Rd
Greenwich, CT 06831
This map was produced from the Town of Greenwich GIS. The Town expressly disclaims any liability that may result from the use of this map. Basemap: 4/2/08. Parcels: 10/1/12. Copyright 2005 Town of Greenwich
This map was produced from the Town of Greenwich GIS. The Town expressly disclaims any liability that may result from the use of this map. Basemap: 4/2/08. Parcels: 10/1/12. Copyright 2005 Town of Greenwich
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| 51. | 10-3462 | 46 Burying Hill Road | Lois Zenkel  
46 Burying Hill Rd.  
Greenwich, CT 06830 |
| 52. | 10-3461 | 15 Bayberry Lane | Jodi Speaker, Lynne Abramson  
15 Bayberry Lane.  
Greenwich, CT 06831 |
| 53. | 11-9010 | 0 Lake Ave | Babcock Park and Playground  
Lake Ave  
Greenwich, CT 06830 |
July 2, 2020

RE: Subdivision of 836 Lake Avenue, Greenwich, Connecticut
Aquarion Water Company of Connecticut
Notice of Filing of Preliminary & Final Subdivision Applications

Dear Neighboring Property Owner:

Our firm represents Aquarion Water Company of Connecticut (“Aquarion”), owner of property known as 836 Lake Avenue, Greenwich, Connecticut (the “Property”). The Property is approximately 98.271+- acres and is located in the RA-4 (4 Acre Residence) Zone.

I am writing to inform you that Aquarion has filed applications with the Town of Greenwich Planning and Zoning Commission seeking Preliminary and Final Subdivision Approvals (the “Applications”) to subdivide the Property into four (4) lots. Lots 1 and 2 (the “Residential Lots”) will contain approximately four (4) acres each and are designed for single-family residential use in accordance with the standards of the RA-4 Zone. The third lot is proposed to be 72.271+- acres and will be preserved as open space. The last lot will be retained by Aquarion for continued use by Aquarion and contains 18+- acres.

The Applications will facilitate the future construction of a single-family home and accessory residential improvements on both Residential Lots, which will be located in the southwest portion of the Property along Cherry Valley Road. A sketch showing the approximate location of the proposed lots, is enclosed for your reference.

Please feel free to contact me if you have any questions regarding this application, or Elizabeth Camerino-Shultz of Aquarion (203-336-7632). Alternatively, you may also contact the Planning and Zoning office at 203-622-7894 for information concerning this application.

Sincerely,

Jacqueline O. Kaufman

Jacqueline O. Kaufman
Proposed Four (4) Lot Subdivision
Illustrative Location Plan
6.19.2020
July 23, 2020

VIA HAND DELIVERY

Ms. Patricia Sesto
Director, Inland Wetlands and Watercourses Agency
Town of Greenwich
101 Field Point Road, 2nd Floor
Greenwich, CT 06830

RE: Response to Staff Report
Subdivision of 836 Lake Avenue, Greenwich, Connecticut
Aquarion Water Company of Connecticut
Inland Wetlands and Watercourses Agency ("IWWA") Permit Application for Activity Within and Proximate to Regulated Areas (the "IWWA Application")

Dear Ms. Sesto:

I am writing today on behalf of Aquarion Water Company of Connecticut (the "Applicant") and in response to the questions presented in the staff report dated, Friday, July 18, 2020.

[Staff] Comments / Questions / Recommendation

1. Overall, the plan is laudable in that it protects 72 acres of open space and proposes to disturb a little more than two acres of the eight acres that comprise the residential lots.

   We Concur.

2. The development of lot 2 necessitates crossing narrow portions of a hillside wetland. The alternatives evaluation considers three other development proposals with more residential lots. What the discussion does not include is consideration of locating the second lot elsewhere on the site that would eliminate the need for a wetland crossing. This discussion should include the feasibility of locating a building envelope that would not require a wetland crossing. If such is feasible, what are the probable consequences to the vernal pools, watercourses, and wetlands due to elimination of critical terrestrial habitat, increase in edge habitat, the introduction of residential landscape in the upland

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review area, and the potential for direct wetland impacts for driveway access, as applicable.

The attached Exhibit IW-1, entitled, “Lot #3 Alternate Layout Plan”, dated July 24, 2020, prepared by DYMAR, demonstrates the potential for a third lot off of Lake Avenue that does not result in any direct wetland disturbance or loss. However, this lot does have other wetland and ecological impacts. The lot has greater impacts to habitat for obligate vernal pool species and habitat for the endangered northern long-eared bat (see attached Exhibit 2) and other wildlife species. The lot is located in the heart of the property, in an area of mature forest, with little to no invasive vegetation. While this development would result in no direct wetland impacts, the proposed access drive is located very close to several wetland areas. The proposed development for this lot will be located within the core area of the Critical Terrestrial Habitat (CTH) of three vernal pools (VPs) (see attached Exhibit 3).

Whereas, the preferred development lot, the lot with proposed direct wetland impact, is located within the CTH of only one VP and it’s only within the periphery of the CTH, not the core. Being within the core will result in greater disruption of amphibians and reptiles as they migrate from the VPs and move between them. The alternate lot location would also likely become a vehicle for the introduction of invasive vegetation to an area of forest where little exists today. The increase in invasive vegetation likely would result from increased sunlight exposure from forest clearing and from seed dispersed from the development landscape.

3. **The level spreader on lot 1 associated with the infiltrator overflow discharges to a 20% slope. What is the ground cover characteristic below the level spreader? At what size storm is the infiltrator expected to overflow? If the overflow occurs with more frequent storms, what is proposed to ensure the device stays level for the duration of its life.**

Attached are the discharge flows for the Level Spreader in Lot #1. No discharge will occur for the smaller storms due to the upstream BMP’s, and the maximum velocity is about 0.5 ft per second for the 100 Yr. storm, which is non-erosive for the existing soil conditions. This velocity on the slope will not create rill erosion, as the velocity is well below published allowances of up to 2 feet per second for soils comprised of loam, and sandy loams. The devise has a rigid fixed metal edge that is to be level to maintain even flow. So long as the level spreader is not damaged, the metal weir will stay level as it is permanently secured into the ground. The metal is made of aluminum and not steel, so it will not corrode. Like any element, inspections to verify the level spreader remains level is always a good practice.
4. The culvert on lot 2 will alter the pattern of flow for the 30-50 foot sections of the wetlands. Discussion of how the dimensions of the riprap apron were determined to achieve a diffused flow would be helpful.

All the culverts on Lot 2 are pass thru’s to convey the existing concentrated intermittent watercourses draining a small watershed to the west. There are actually three cross culverts along the driveway for Lot #2. Each culvert was located at each wetland crossing to maintain existing drainage patterns for each wetland, which are seasonal watercourses. This avoids any diversion of surface runoff from one wetland corridor to the other. The rip rap pad at each culvert outfall was designed to match the existing wetland corridor to disperse the drainage flow at the culvert outlet. The USDA publication for Energy dissipation for a minimum tailwater condition, @ 3 cfs, suggests a minimum riprap apron of 5 feet long and 6 feet wide. We well exceed that threshold for lesser flows.

a. Culvert #1; the southern crossing: 68 lf 12” CPP @ 0.150 ft/ft – has a 5’x 10’ natural stone level spreader pad at FE #2 upstream of Wetland Flag #205; the flow for the 25 year storm is under 1.5 cfs.

b. Culvert #2; the middle crossing: 50 lf 12” CPP @ 0.120 ft/ft – has a 13’ x 8’ natural stone level spreader pad at the End Wall spanning the width of the wetlands from WF #209 to #222; the flow for the 25 year storm is under 1.5 cfs.

c. Culvert #3; the northern crossing: 30 Lf 12” CPP @ 0.100 ft/ft – has a 10’ x 8’ natural stone splash pad at the End Wall spanning the width of the wetlands near WF #302. This wetland drains a portion of the subject property, plus some of our neighbor’s property resulting from an impoundment created by the stonewall spanning the area and seeps thru the wall. This seep occurs as a high-level overflow when water levels rise above a certain level draining to Culvert # 2. This flow occurs predominantly in the wet season months.

5. The limit of rear yard shown on the DYMAR site plan for lot 1 aptly utilizes an existing stonewall as its boundary. The limit of rear yard for lot 1 on the William Kenny Associates LLC map shows the lawn extending pass the stonewall and further into the wetland buffer. The Kenny map should be revised to be consistent with the DYMAR map.

The Kenny map (“Wetland & Buffer Habitat Enhancement & Conservation Plan,” dated July 23, 2020; REV.1) has been revised to be consistent with the Dymar map.

6. Lot 2 likewise has a stonewall to the rear of the house. Notwithstanding the incongruity between the William Kenny plan and DYMAR’s plan regarding the limit of lawn, the DYMAR map shows the limit of lawn west of the stonewall to the rear of the house. Both plans depict the proposal to relocate this wall to the eastern property boundary. As experience has shown, homeowners have a strong tendency to clear vegetation in whole or in part to a natural boundary. In this case, the natural boundary is the stonewall. It
will serve wetland protection better to leave the wall in its current location to protect the woodlands beyond it, or better yet, to relocate it westward to the limit of lawn as depicted on the DYMAR plan.

The stone wall on Lot 2 must be moved to allow for the septic system to be installed. The existing wall is closer than the 50 feet minimum to a down gradient stonewall. The septic system cannot be moved further west due to shallow bedrock.

7. More details are needed with regard to the notes on the Wetland & Buffer Habitat Enhancement plan. Areas adjacent to lot 2’s driveway are to be revegetated and naturalized “with the establishment of native grasses, ferns, and/or wildflowers.” Will this area be simply seeded or planted with established vegetation? If planted with established vegetation, how many, what size, and where? What is the specific planting plan for the rain garden?

Areas adjacent to the eastern portion of lot two’s driveway will be revegetated and naturalized by establishing native groundcover from seed. The seed mixes are specified on the “Native Ground Cover Seed Mix Notes” that are provided on the WKA Wetland & Buffer Habitat Enhancement & Conservation Plan drawing. Additional notes have been added to the drawing to make it easier for the user to be aware of the meadow seed mix information.

8. Lot 2 has two more rain gardens that are within the limit of lawn. Manicured grass is not as effective at achieving the goals of a rain garden. Consideration should be given to planting the rain garden in such a way as to maximize pollutant uptake and trapping.

We agree to plant the rain garden in such a way as to maximize pollutant uptake and trapping. The rain gardens will be vegetated with native ground covers via a meadow seeding. The Wetland & Buffer Habitat Enhancement & Conservation Plan has been revised to reflect this change.

9. The two-phase approach to lot 2 is beneficial to reducing the risk of short term impacts to the wetlands. Likewise, the construction sequence aptly includes provisions for marking trees to remain and to be cut. This is beneficial in reducing the risk of erroneous tree removal.

We Concur.

10. This staff report was prepared without the benefit of comments from DPW Engineering Division. Additional modifications to the plan may be warranted in light of that review.

The Applicant shall respond to DPW comments upon receipt.
Thank you for the opportunity to respond. We welcome an opportunity to speak with you in advance of the hearing regarding these responses and look forward to presenting before the IWWA next week.

Sincerely,

Jacqueline Kaufman

cc: Development Team
    P. Manges
July 2, 2020

VIA E-MAIL: Katie.DeLuca@greenwichct.org; Peter.Mangs@greenwichct.org;

Ms. Katie DeLuca, AICP
Director, Planning & Zoning Department
Town of Greenwich
101 Field Point Road, 2nd Floor
Greenwich, CT 06830

Peter Mangs
Application Coordinator
Town Hall, Planning & Zoning Department
101 Field Point Road, 2nd Floor
Greenwich, CT 06830

RE: Subdivision of 836 Lake Avenue, Greenwich, Connecticut
Aquarion Water Company of Connecticut
Final Subdivision Application

Dear Ms. DeLuca and Mr. Mangs:

On behalf of Aquarion Water Company of Connecticut (the “Applicant”), enclosed please find application materials submitted in connection with the subdivision of 836 Lake Avenue, Greenwich, CT (the “Property”). The existing Property is approximately 98.271 +/- acres. The Property is in the RA-4 (4 Acre Residence) Zone.

The enclosed application will facilitate the subdivision of the Property into four (4) lots. Lots 1 and 2 (the “Residential Lots”) will contain approximately four (4) acres each and are designed for single-family residential use in accordance with the standards of the RA-4 Zone. The third lot is proposed to be 72.271 +/- acres and will be preserved as open space. The last lot will be retained by Aquarion for continued use by Aquarion and contains 18 +/- acres. Both Residential Lots will be located in the southwest portion of the Property along Cherry Valley Road.

For further details related to this proposal, please refer to the enclosed application materials which include:

- One (1) check in the amount of $1,960.00, representing the Final Subdivision Application Fee & State Application Fee;
- One letter of authority from Aquarion Water Company of Connecticut;
- A Final Subdivision Application form and associated Application Checklist;

(S7254168)
• Civil Engineering Plans prepared by Dymar LLC, dated June 19, 2020, entitled:
  • “4 Lot Residential Subdivision, Lake Avenue and Cherry Valley Road, Greenwich, Connecticut [Cover Sheet];”
  • “General Legend, Abbreviations & Notes, C-1,” revised to June 24, 2020;
  • “Existing Conditions Site Analysis Map, C-2;”
  • “Regulated Activity Impact Plan, C-3,” revised to June 24, 2020;
  • “Lot #1 Grading, Drainage & Utility Plan, C-4A,” revised to June 24, 2020;
  • “Lot #2 Grading, Drainage & Utility Plan, C-4B,” revised to June 24, 2020;
  • “Test Hole Date & Septic Feasibility Data, C-5;”
  • “Lot #1 Erosion & Sedimentation Control Plan, C-6A,” revised to June 24, 2020;
  • “Lot 2 Erosion & Sedimentation Control Plan, C-6B;”
  • “Erosion & Sediment Control Narrative, C-6C;”
  • “Erosion & Sediment Control Construction Standards and Miscellaneous Details, C-6D;”
  • “Erosion & Sediment Control Details, C-6E;”
  • “Construction Driveway Plan & Profile – Lot #2, C-7;”
  • “Paving, Storm Sewer & Utility Details, C-8A;”
  • “Miscellaneous Site Details, C-8B;”
  • “Construction Specifications & Standards, C-9A;”
  • “Earthwork Specifications, C-9B;”
  • “Lot #1 Low Impact Development Plan, C-10A,” revised to June 24, 2020; and
  • “Lot #2 Low Impact Development Plan, C-10B,” revised to June 24, 2020;

• Surveys and Plans prepared by Oehman Associates, Inc. dated June 16, 2020, entitled:
  • “North: 4-Lot Residential Subdivision Plan, 1 of 8;”
  • “South: 4-Lot Residential Subdivision Plan, 2 of 8;”
  • “North: Existing Conditions, 3 of 8;”
  • “South: Existing Conditions, 4 of 8;”
  • “Lot 1: Existing Conditions, 5 of 8;”
  • “Lot 2: Existing Conditions, 6 of 8;”
  • “Lot 1: Sight Distance/Profile, 7 of 8;” and
  • “Lot 2: Sight Distance Plan/Profile, 8 of 8.”

• A Stormwater Management Report prepared by Luchs Consulting Engineers & Dymar, LLC, dated June 24, 2020, entitled “Stormwater Management Report, 4 Lot Residential Subdivision Lake Avenue and Cherry Valley Road;”


• A Site Photo Location Plan prepared by William Kenny Associates, LLC entitled “Site Photo Location,” dated June 2020;


(57254168)
- A summary of the Chain of Title for the Property from 1933 to date and proof of the Applicant's ownership of the Property;

- A Certificate of Mailing and affidavit evidencing notification of all abutting property owners of the filing of the enclosed applications;

- A list of owners of abutting properties; and

- A map obtained from the Greenwich GIS Department depicting neighbors notified of the enclosed applications.

All documents have been transmitted to you in an electronic shared file. Supplemental materials, as noted above, will be submitted electronically as soon as they are ready. Ten (10) full-size copies and reduced-size copies of the above-referenced materials, along with checks for all application fees, will be delivered to Greenwich Town Hall under separate cover. We look forward to presenting the enclosed application to the Planning and Zoning Commission. Should you have any questions, please do not hesitate to contact me.

Sincerely,

Jacqueline O. Kaufman

Enclosure

cc: Development Team
Title History – 836 Lake Avenue, Greenwich, CT

The land is presently owned by Aquarion Water Company of Connecticut and consists of approximately 98 acres. The Parcel consists of Class I, II & III Lands in the Watershed Area, It is also in the RA-4 Zone.

Greenwich Water Company owned the land going back to as early as 1897 when it started acquiring parcels that comprise the present holding through the 1920’s.

Connecticut American acquired Greenwich Water Company (we believe in the 1960’s) and held the land until 2002 when Bridgeport Hydraulic Company acquired Connecticut American through a stock acquisition and changed the company name to Aquarion Water Company of Connecticut.

A full title search is being prepared as part of the sale of the open space and will be provided upon receipt.
BOOK 168. MISCELLANEOUS

TO ALL PEOPLE TO WHOM THESE PRESENTS SHALL COME.

KNOW YE, that we, EUGENE M. SMITH and WILLIS B. SMITH, both of the Town of Greenwich, County of Fairfield and State of Connecticut, for the consideration of One ($1.00) dollar and other values, received to our full satisfaction of THE GREENWICH WATER COMPANY, a Corporation organized and existing under and by virtue of the laws of the State of Connecticut, and located in said Town of Greenwich, Deelore, Grant, Bargain and Confirm, unto the said THE GREENWICH WATER COMPANY, all those two certain tracts of land situated near Round Hill in the Town of Greenwich, Connecticut and bounded and described as follows:

Tract No.1. Beginning at the southeast corner of the land hereby conveyed at the point formed by the intersection of the division lines between land hereby conveyed, land of the Greenwich Water Company and land of Sarah Wilkinson et al., and running thence along the land of said Sarah Wilkinson et al., the following courses and distances:

1. 54° 47' 0" N. 235.5 feet and 45° 50' W. 103.4 feet, thence through the land of the Grantees, 190° 5' E. 170.4 feet to land of Ferdinand Dremeer; thence along land of Ferdinand Dremeer, 195° 20' W. 196.7 feet, thence through the land of the Greenwich Water Co.; thence along land of the Greenwich Water Co., 14° 11' 6.5 feet, to point of beginning and containing 11,597 acres.


Tract No.2. Beginning at the point formed by the intersection of the division lines between land hereby conveyed and land of Sarah Wilkinson et al., with the northernly line of the highway and running thence along land of said Sarah Wilkinson et al., the following courses and distances:

1. 54° 47' 0" N. 235.5 feet and 45° 50' W. 103.4 feet, thence through the land of the Grantees, 190° 5' E. 170.4 feet to land of Eugene Smith; thence along land of Eugene Smith, 14° 11' 6.5 feet, to point of beginning and containing 11,597 acres.
of the East Branch of the Pyrnn River and land of James Deweys: 8° 37' 24" N. 34.4 feet 8° 24' 26" W. 27.6 feet 8° 6' 26" W. 45.3 feet 8° 1' 10" W. 63.7 feet 8° 12' 17" W. 40.8 feet 8° 20' 0" W. 64.6 feet 8° 29' 26" W. 24.1 feet 8° 28' 26" W. 26.2 feet 8° 37' 31" W. 100.4 feet 8° 24' 41" W. 37.9 feet 8° 49' 38" W. 99.6 feet 8° 1' 11" W. 60.6 feet 8° 23' 1' W. 46.2 feet 9° 27' 1" W. 36.2 feet 9° 14' 14" W. 11.6 feet 9° 28' 3" W. 15.3 feet 9° 55' W. 32.3 feet to the public highway; those along the public highway the following courses and distances: 9° 36' 13" W. 32.6 feet 9° 30' 12" W. 17.6 feet 9° 34' 4" W. 160.5 feet 9° 21' 32" W. 58.2 feet 9° 23' 23" W. 21.7 feet 9° 30' 4" W. 106.5 feet 17° 16' 32.6 feet 17° 36' 202.9 feet 8° 42' 44.2 feet 15° 39' 21" W. 35.2 feet 15° 47' 5' W. 20' 11.5 feet 23° 37' 7" W. 216.2 feet 14° 59' 12" W. 15.6 feet and containing 16.625 acres.


Together with all right, title and interest in and to said highway, and together with all right, title and interest of the grantors herein, riparian or otherwise, in or to the stream of water known as the East Branch of the Pyrnn River so far as the same affects the property herein conveyed.

IT IS AGREED that the grantee herein assumes and agrees to build and maintain all necessary division fences between the land herein conveyed and the land of the grantor.

TO HAVE AND TO HOLD the above granted and bargained premises with the appurtenances thereof, into it the said grantee, its successors and assigns, forever, to it and their own proper use and benefit, and also we the said grantee do for ourselves, our heirs, executors and administrators, covenant with the said grantee, its successors and assigns, that as and until the unalienation of these premises we willwell and defend the said premises and occupy and sell the same in manner and form as in above written, and that the same is free from all incumbrances whatsoever.

AND FURTHERMORE, we the said grantors do by these presents bind ourselves and our heirs forever to warrant and defend the above-granted and bargained premises to the said grantee, its successors and assigns, against all claims and demands whatsoever.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this 30th day of November, A.D. 1918.

Signed, sealed and delivered
In presence of
Harry G. Senftfield
Kemp M. Smith
Geo. O. Hee
Willie R. Smith

STATE OF CONNECTICUT

County of Fairfield

Personally appeared Harry M. Smith and Willie R. Smith, signers and executors of the foregoing instrument and acknowledged the same to be their free act and deed before me,

Harry G. Senftfield Notary Public

Received for Record Nov. 30, 1918 at 11:51 A. M. and recorded by—

Town Clerk.

KNOW ALL MEN BY THESE PRESENTS—That we, Ottoman Hunt Deane and Annie Ray Deane, both of Greenwich, Connecticut, do give and grant to the Borough of Greenwich, a municipal corporation located in the Town of Greenwich, County of Fairfield and State of Connecticut, the right to lay and maintain a drainpipe not to exceed twenty (20) inches in diameter, for surface water from West Main Street along the division line between the land of said
BOOK 160 WARRANTED DBBD.

To all people to whom these Presents shall come, Greeting:

KNOW YE THAT I, Mary Bertha Butler Langs, wife of Herman Langs, of the Town of Greenwich, County of Fairfield and State of Connecticut, married subsequent to April 25, 1895

For the consideration of One Dollar and other good and valuable considerations received to my full satisfaction of The Greenwich Water Company, a corporation organized and existing under and by virtue of the laws of the State of Connecticut and located in said town of Greenwich

Do give, grant, bargain, sell and convey unto the said Greenwich Water Company, all that certain tract, piece or parcel of land situated in said Town of Greenwich at Round Hill so-called, and bounded and described as follows:

Beginning at the southeast corner of the tract hereby conveyed at the point of intersection of the division line between land of the grantor and land of the grantee and running thence along the division line between land of the grantor and land of the grantee N. 10° 40' 20" E. 100.4 feet; S. 76° 37' 48" E. 51.8 feet; S. 8° 34' 50" W. 131.46 feet; S. 80° 31' 30" E. 96.5 feet; E. 48° 35' 30" W. 16.03 feet W. 10° 19' W. 94.0 feet S. 10° 40' 20" E. 100.4 feet; S. 8° 34' 50" W. 131.46 feet and N. 78° 34' 50" W. 685.7 feet, thence through land of the grantor E. 10° 40' 20" 252.45 feet to the place of beginning containing 3.1 acres.

Bounded westerly by other land of the grantee and on other sides by other land of the grantee.

Being a portion of the premises conveyed to the grantor by the certain deed on file from Sarah Wilkinson and Margaret Mahone to the grantee dated May 20, 1923 and recorded in Greenwich Land Records in book 164 at page 83, and the other from William Keenan Incompetent by Sarah Wilkinson Conservator dated May 20, 1923 to the grantor and recorded in Greenwich Land Records 164 at page 83.

Do have and to hold the above granted and bargained premises, with the privileges and appurtenances thereunto appertaining, to the said grantee its successors and assigns forever to him and their own proper use and benefit, and also to the said grantor and his heirs, executors, and administrators, with the said grantor its successors and assigns forever subject to the same, to the use and benefit of the said grantor and its successors and assigns, and against all claims and demands whatsoever.

And furthermore, I, the said grantor do, by these presents, bind myself and my heirs forever to warrant and defend the above granted and bargained premises in and the said grantee its successors and assigns, against all claims and demands whatsoever.

In witness whereof, I have hereunto set my hand and seal this 31st day of July A.D. 1923.

[Signature]

Mary Bertha Butler Langs

(Seal)

Estate of Connecticut,

County of Fairfield, Connecticut

July 21, A.D. 1923

Personally appeared, MARY BERCHA BUTLER LANGS, Signer and Sealer

of the foregoing instrument, and acknowledged the same to be my free act and deed before me.

[Seal]

Herman White

Notary Public

Witnessed for Record, Aug. 1, 1923.

[Seal]

[Seal]

[Seal]
Alice Allen, under the last will and testament of Catherine A. Wallace, late of Greenwich in the County of Fairfield and State of Connecticut, deceased, against Adam Shrubers, Agnes Shrubers, Ann Elizabeth Shrubers, Mary Ann Shrubers, Catherine Shrubers, Joseph Shrubers and Francis Shrubers, all of said Greenwich, defendants, claim a foreclosure of a certain mortgage upon the premises hereinafter described, rendered judgment for the sum of forty-three hundred and two dollars and twenty-nine cents ($4328.29) which was due from the defendants to the plaintiff on the mortgage mentioned in the complaint in said action, and said mortgage be foreclosed by sale of said real estate in separate parcels, at public auction, on the premises, on the 13th day of July, 1824, at two o'clock. P.M., and did in said judgment appoint the subscriber, William H. Vesells, of said Greenwich, as a committee to make such sale, and did direct him to advertise such sale by publishing a notice thereof, containing a description of the premises in the Greenwich News and Graphic, a weekly newspaper printed in said Greenwich, three times successively beginning on the fourth day of July 1824; and whereas the subscriber pursuant to the terms of said judgment did advertise said sale in the Greenwich News and Graphic, in its issues of July 4th, July 11th and July 18th, and did on the 16th day of July 1824, at two o'clock p.m., sell the first parcel of land described in said judgment, containing eight acres more or less, with the buildings thereon, at public auction on the premises to THE GREENWICH WATER COMPANY, a corporation organized under the laws of the State of Connecticut, and having a place of business at Greenwich in said State, it being the highest bidder therefor.

Now, therefore, know ye, that I, the said William H. Vesells, Committee as aforesaid, in pursuance of the authority and direction given aforesaid, and in consideration of the sum of forty-three hundred and twenty dollars ($4328.29) received to my full satisfaction of The Greenwich Water Company, do give, grant, bargain and sell and confirm unto the said Greenwich Water Company, all that certain tract, piece or parcel of land with the buildings thereon standing situated in said Greenwich, containing eight acres more or less, bounded northerly by land formerly of Joshua Mead, nor of the Greenwich Water Company, westerly by the highway, southerly by land formerly of the estate of Abraham Mead, but nor of said Water Company and land of James Sweeney, and easterly by land formerly of the estate of A. Lincoln Mead, deceased, but nor of said Water Company,

TO HAVE AND TO HOLD the premises, with all the appurtenances unto the said Greenwich Water Company, its successors and assigns forever, so that neither the said Adam Shrubers, Agnes Shrubers, Ann Elizabeth Shrubers, Catherine Shrubers, Joseph Shrubers and Francis Shrubers, nor their heirs, nor any person under them, shall hereafter have any claim, right or title in or to the premises, or any part thereof, but therefrom they are by these presents forever barred and excluded. The Town tax due Jan. 1, 1824, to be paid by said Water Co.

IN WITNESS WHEREOF I have hereunto set my hand and seal, this 28th day of September, 1824.

WITNESS: sealed and delivered.

In the presence of

William H. Vesells,
Committee

STATE OF CONNECTICUT
County of Fairfield 28 Town of Greenwich, Sept 28th, 1824.
To all People to whom these Presents shall come; greeting,

KNOW YE THAT

the town of Greenwich, County of Fairfield, and State of Connecticut

for the consideration of One Hundred and Fifty dollars, received in full satisfaction of The Greenwich Water Company of said Town of Greenwich,

do give, grant, bargain, sell and convey unto the said The Greenwich Water Company, all those three certain tracts of land with the buildings, thereto appertaining, situate in said Town of Greenwich on Round Pond (as called) The first of said tracts is a quantity three acres and more or less, bounded northerly by land of William W. Seabury, easterly by land of Isaac D. Holmsho, southerly by land of the heirs of Benjamin Southwick deceased and westerly on the said town highway and westerly on the land of the heirs of Isaac Southwick deceased, the said William W. Seabury, and the said Isaac D. Holmsho, and northerly by land of said Benjamin Southwick deceased and the heirs of his aforesaid. And the same as said tract is quantity one eighth (1/8) of the said 3 acres and more or less, bounded northerly and westerly by land of said William W. Seabury, easterly by the highway and southerly by the first tract here described. The said 3 acres and more or less westerly were surveyed by the said John Mead by Jeremiah Hewes of New Haven, the said John Mead, by warrantee deed dated April 21, 1820, and recorded in said Records of said Town of Greenwich No. 3 at page 158, and the said 3 acres and more or less westerly were surveyed by the said John Mead by Jeremiah Hewes of New Haven, the said John Mead, by warrantee deed dated April 21, 1820, and recorded in said Records of said Town of Greenwich No. 3 at page 158.

And further that the said grantor do by these presents have, grant, sell, and convey the above granted and bargained premises to the said grantee, and all and every part thereof to warranty and assure the above granted and bargained premises to the said grantee, to have and to hold, and to his heirs, his executors, administrators, his assignees, and the heirs of his assigns, forever to warranty and assure the above granted and bargained premises to the said grantee, to have and to hold, and to his heirs, executors, administrators, and the heirs of his assigns, forever.

In witness whereof, I have hereunto set my hand and seal the 29th day of March A.D. 1820.

[Signature]

[Signature]

STATE OF CONNECTICUT

FAIRFIELD COUNTY, in Greenwich, March 29

Personalty appear Joshua Mead

[Signature]

Witness: John Burdick

[Signature]

Commissary of the Peace

[Signature]

Notary Public
BOOK 78—WARRANTEE DEED.

To all People to whom these Presents shall come, GREETING,

KNOW YE, THAT Henry C. Mead, of the town of Greenwich, County of
Fairfield, and State of Connecticut

This is a warrantee deed where the grantor, Henry C. Mead, transfers a piece of land to the Greenwich Water Company. The deed includes the granting of specific rights and covenants to the grantee, the Greenwich Water Company. The description of the land includes a reference to certain tracts of land, and the deed is witnessed and acknowledged by the parties involved. The date of the deed is April 15, 1817, and the deed is recorded in the Fairfield County, Connecticut, records.
JOSHUA MEAD
TO
THE GREENWICH WATER COMPANY

Warrantee Deed

Book 76, Page 54
March 25, 1897
March 25, 1897

Conveys all those three certain tracts of land with the buildings
thereon situated in said Town of Greenwich at Round Hill (so called).

First of said tracts, in quantity, 12 acres more or less.
Bounded Northerly by land of William Wilson, Easterly by
land of Grace C. Lattimer, Southerly by land of the heirs of Edmund
Denks, deceased, and land described as the Third Tract herein and
Westerly by the highway.

Second of said tracts in quantity 30 acres more or less
Bounded Northerly by land of said William Wilson, of Nath-
aniel Ferris and of Augustus Lockwood, Easterly by the highway,
Southerly by lands of the Estate of Silas Husted, deceased, and of
Elizabeth Tibbols and Westerly by lands of said estate of Silas Husted,
deceased, and of said Nathaniel Ferris and the

Other of said tracts in quantity 1/8 of an acre more or less.
Bounded Northerly and Westerly by land of William Wilson,
Easterly by the highway and Southerly by the first tract herein de-
scribed.

The First and Second Tracts above described, were conveyed
to the said Joshua Mead by Jeremiah Green by Warrantee Deed dated
October 1, 1892 and recorded in the Land Records of said Town of Green-
wich in Book 66, Page 150, and the other of said Tracts by Major A.
Lockwood by Warrantee Deed dated April 20, 1893 and recorded in said
Records in Book 76, Page 287.

12 Acres
30 Acres
1/8 Acre
JOSHUA MEAD $40

BENJAMIN LOCKWOOD) Mortgage Deed

TO

CONKLIN HUSTED ) $500.00

Book 44, Page 130

July 17, 1876

First Tract: 12 acres more or less.
Bounded: North by Alle Africorn, East by Court S. Le
Forge, South by heirs of Edmund Banks and Major Lockwood and West
by highway.

Second Tract: 30 acres more or less.
Same description as in deed from Grem to Hck in Book 65,
Page 150, except that no mention is made of Augusta Lockwood as a
north boundary.
Above property subject to dower interest of mother, Alice
Lockwood, in the estate of my father, Harvey Lockwood.

CONKLIN HUSTED ) Quit Claim

TO

BENJAMIN LOCKWOOD ) $1.00

Book 46, Page 169

April 22, 1879

Releases 12 acres and 30 acres from mortgage as described in Book
44, Page 150.

BENJAMIN LOCKWOOD) Mortgage Deed

TO

JEREMIAH GREEN ) $1,700.00

Book 44, Page 272

April 21, 1879

Two tracts in Round Hill.

First Tract: 12 acres more or less.
Bounded: North by William Wilson, East by Grace C. Le-
timer, South by the heirs of Edmund Banks and Major Lockwood and
West by highway.

Second Tract: 30 acres more or less.
Bounded: North by William Wilson, Nathaniel Ferris and
Augusta Lockwood, West by highway, South by Estate of Silas Husted
Being the same premises conveyed to Jeremiah Green by
Benjamin Lockwood, (except a small piece on the North which was con-
veyed to Augusta Lockwood) by deed dated March 13, 1830 and recorded
in Book 61, Page 175.

MAJOR A. LOCKWOOD)  Warrantee Deed
TO                    $1.00
JOSHUA MEAD           Book 66, Page 257
                        April 28, 1833

x x x on the highway leading from Greenwich to Bedford and
Bounded North and West by William Wilson, East by said highway
and South by Joshua Mead.

Same conveyed to Major A. Lockwood by Jeremiah Green, March 21,
1830 in Book 62, Page 179.
R. JAY WALSH TO THE GREENWICH WATER COMPANY

Quit Claim Deed
Book 130, Page 45
October 22, 1910
October 28, 1910

Releases All that certain tract of land, with the buildings thereon, situated in said Town of Greenwich, at Round Hill, so called, in quantity one (1) acres, more or less.

Bounded Northerly by land now or formerly of Nathaniel Ferris; Easterly by highway, Southerly by land now or formerly of Benjamin Lockwood, and Westerly by land now or formerly of Nathaniel Ferris.

Being the same premises conveyed to the Grantor by Laura A. Wilcox, wife of Silbert L. Wilcox, by Quit Claim Deed dated December 13, 1909, and now on file for record in the Town Clerk's office of said Town of Greenwich.

(Signed) R. Jay Walsh.

1 acre more or less.
TO ALL PEOPLE TO WHOM THESE PRESENTS SHALL COME, GREETING:

Whereas the Superior Court, within and for the County of Fairfield did on the 13th day of June 1924, in an action brought by Elizabeth M. Mills, Trustee for Alice Allen under the Last Will and Testament of Catherine A. Wallace, late of Greenwich in the County of Fairfield and State of Connecticut, deceased, against ADAM SHREDSER, AGNES SHREDSER, ANN ELIZABETH SHREDSER, MARY AGNES SHREDSER, CATHERINE SHREDSER, JOSEPH SHREDSER and FRANCES SHREDSER, all of said Greenwich, defendants, claim a foreclosure of a certain mortgage upon the premises hereinafter described, rendered judgement for the sum of Forty-three hundred and two Dollars and twenty-two cents ($4322.22) which was due from the defendants to the plaintiff on the mortgage mentioned in the complaint in said action, and that said mortgage be foreclosed by sale of said real estate in separate parcels, at public auction on the premises, on the 19th day of July, 1924, at two o'clock P.M., and did in said judgement appoint the subscriber, William H. Wesser, of said Greenwich, a Committee to make such sale, and did direct him to advertise such sale by publishing a notice thereof, containing a description of the premises in the Greenwich News and Graphic, a weekly newspaper printed in said Greenwich, three times successively beginning on the fourth day of July, 1924, and whereas the subscriber pursuant to the terms of said judgement did advertise said sale in the Greenwich News & Graphic, in its issues of July 4th, July 11th and July 18th, and did on the 19th day of July 1924, at two o'clock P.M. sell the first parcel of land described in said judgment, containing eight acres more or less, with the buildings thereon, at public auction on the premises to the Greenwich Water Company, a corporation organized under the laws of the State of Connecticut, and having a place of business at Greenwich in said State, it being the highest bidder therefor.

NOW THEREFORE, Know Ye, That I, the said William H. Wesser, Committee as aforesaid, in pursuance of the authority and direction given aforesaid, and in consideration of the sum of Forty-six hundred and Fifty Dollars ($4650.) received to my full satisfaction of The Greenwich Water Company, do give, grant, bargain and sell and confirm unto the said The Greenwich Water Company, All that certain tract, piece or parcel of land with the buildings thereon standing, situated in said Greenwich, containing eight acres more or less, bounded Northerly by land formerly of Joshua Nead, now of the Greenwich Water Company; Easterly by the highway; Southerly by land formerly of the Estate of Abraham Nead, but now of said Water Company and land of James Sweeney; and Westerly by land formerly of the Estate of A. Lincoln Nead, deceased, but now of the said Water Company.

TO HAVE AND TO HOLD The premises, with all the appurtenances, unto the said The Greenwich Water Company, its successors and assigns forever, so that neither the said Adam Shredders, Agnes Shredders, Ann Elizabeth Shredders, Helen Dorothy Shredders, Catherine Shredders, Joseph Shredders and Frances Shredders, nor their heirs, nor any person under them, shall hereafter have any claim, right or title in or to the premises, or any part thereof, but therefore they are by these presents forever barred and excludad. The Town Tax due January 1, 1925 to be paid by said Water Company.
IN WITNESS WHEREOF I have hereunto set my hand and seal, this
25th day of September, 1924.

Signed, Sealed and  )
delivered in presence of:
W. C. Runge
Theresa M. Pederson  )

(Signed) William H. Wessels,
Committee

STATE OF CONNECTICUT

COUNTY OF FAIRFIELD

Approved September 26, 1924
Marini, J.

F. C. Runge,
Notary Public.

Recorded in the Greenwich Land Records - Book 212, Page 30 -
September 25, 1924.

8 Acres.
HARRY C. MEAD

TO

THE GREENWICH WATER COMPANY

Warronfe Deed
Book 78, Page 77
April 15, 1897
April 25, 1897

CONVEYS All that certain tract of land situated at Round Hill
in said Town of Greenwich in quantity 8-146/1000 Acres.

Bounded Northerly by land of Joshua Mead, Easterly
by land of Louisa Tyler, wife of George E. Tyler, Southerly by
land of James Sweeney, and Westernly by land formerly of Joshua
Mead and now of said Greenwich Water Company.

8-146/1000 Acres
Conveys all those two certain tracts of land situated near Round Hill in the Town of Greenwich, Conn. and bounded and described as follows:

**Tract No. 1:** Beginning at the southwest corner of the land hereby conveyed at the point formed by the intersection of the division lines between land hereby conveyed, land of the Greenwich Water Company and land of Sarah Wilkenson et al., and running thence along land of said Sarah Wilkenson et al., the following courses and distances: North 74°47' West 223.6 feet and North 72°46'50" West 105.4 feet thence through the land of the Grantees - North 18°54' East 1703.1 feet to Land of Ferdinand Creamer; thence along land of Ferdinand Creamer; South 82°51' East 135 feet, South 87°27' East 65.5 feet and South 84°7' East 58.7 feet to the land of the Greenwich Water Company; thence along the land of the Greenwich Water Company South 14°77' West 641.1 feet, South 6°33' West 32.25 feet South 16°45' West 122 feet, South 17°17' West 200.25 feet, South 16°35' West 430.1 feet, South 16°59' West 100.2 feet, South 13°01' West 90.5 feet and South 14°54'30" West 122.6 feet to the place of beginning and containing 11.387 acres.


**Tract No. 2:** Beginning at the point formed by the intersection of the division line between land hereby conveyed and land of Sarah Wilkenson et al., with the Northerly line of the highway and running thence along land of said Sarah Wilkenson et al., the following courses and distances: South 65°28'20" East 196.7 feet, South 78°26' East 486.7 feet, North 3°36' West 63.6 feet, North 10°04' West 22.6 feet, North 31°19' East 94.3 feet to land of the Greenwich Water Company; thence along land of the Greenwich Water Company to and across the East Branch of the Pyram River, the following courses and distances: South 75°17' East 41.15 feet and South 71°25'30" West 725.1 feet to land of James Sweeney; thence along land of James Sweeney the following courses and distances: South 49°20'50" West 202.55 feet, South 57°30' West 150.5 feet South 1°45' East 55.05 feet, North 68°19' West 18.8 feet, North 80°01' West 68.0 feet, North 72°38' West 52.5 feet, North 25°05' West 35.5 feet, North 53°10' East 19.4 feet, North 68°05' East 65.8 feet, North 36°04' East 211.5 feet, North 35°55' West 50.9 feet, North 16°22' East 15.3 feet, North 30°55' West 106.0 feet, North 77°36' West 274.3 feet to the center line of the East Branch of the Pyram River; thence along the center line of the East Branch of the Pyram River and land of James Sweeney: South 37°03'48" West 44.4 feet.
South 24°28' West 27.4 feet, South 60°24' West 45.3 feet, South 60°24' East 90.7 feet, South 57°03' West 24.1 feet, South 28°30' West 79.1 feet, South 57°31' West 100.4 feet, South 24°48' West 37.3 feet South 40°35' East 70.8 feet, South 50°11', East 80.4 feet, South 32°01' East 40.5 feet, South 9°27' East 36.25 feet, South 18°14' West 11.00 feet, South 70° 3' West 15.20 feet, South 56°57' West 26.50 feet, South 7°59' West 58.50 feet to the public highway; thence along the public highway the following courses and distances: North 76°59' West 9.2 feet, North 53°20' West 17.8 feet, North 24°4' West 108.5 feet, North 21°53' West 58.05 feet, North 38°23' West 01.7 feet, North 39°41' West 168.4 feet, North 57°13' West 32.6 feet North 27°36' East 342.0 feet, North 0°42' East 44.2 feet, North 15°37' West 32.6 feet, North 25°21' West 136.9 feet, North 85°37' West 216.2 feet to the place of beginning, and containing 16,625 acres.


TOGETHER with all right, title and interest in and to said highway, and together with all right, title and interest of the grantees herein, riparian or otherwise, in or to the stream of water known as the East Branch of the Arcum River so far as the same affects the property herein conveyed.

IT IS AGREED that the grantees herein assumed and agree to build and maintain all necessary division fences between the land herein conveyed and the land of the grantees.

(Signed) Horace R. Smith
Willis R. Smith

11.927 Acres
and
16.625 Acres
MARY BERTHA BUTLER LANGE, } Warranted Deed
Wife of Herman Lange } Book 199, Page 173
TO } July 31, 1923
} August 1, 1923
THE GREENWICH WATER COMPANY

Conveyed All that certain tract, piece or parcel of land situated in said Town of Greenwich at Round Hill so called, and bounded and described as follows:

Beginning at the northwest corner of the tract hereby conveyed at the point of intersection of the division lines between land of the Grantor, land of the Grantee and land formerly of Horace and Willis Smith and running thence along the division line between land of the Grantor and land of the Grantee; South 72°45'30" East 102.4 feet, South 74°47' East 233.6 feet, South 14°54'30" East 120.45 feet, South 65°11' East 38.5 feet, South 96°13' East 18.65 feet, South 31°12' West 94.2 feet, South 10°01' East 29.6 feet, South 5°53' East 64.8 feet and North 76°28' West 466.7 feet, thence through land of the Grantor North 18°6' East 552.4 feet to the place of beginning and containing 3.1 acres.

Bounded Westerly by other land of the Grantor and other sides by other land of the Grantee.

Being a portion of the premises conveyed to the grantor by two certain deeds one from Sarah Wilkinson and Margaret Nashier to the grantor dated May 28, 1921 and recorded in the Greenwich Land Records in Book 184 at Page 25, and the other from William Keenac Incompetent by Sarah Wilkinson Conservator dated May 28, 1921 to the grantor and recorded in the Greenwich Land Records, Book 185, Page 257.

(Signed) Mary Bertha Butler Lange
L.S.

E. J. Lucke
H. B. White

3.1 Acres
HENRY G. DRINKWATER  

TO  

THE GREENWICH WATER COMPANY  

Warranty Deed  
Book 172, Page 564  
May 28, 1920  
June 2, 1920  

Conveys All that certain tract, piece or parcel of land situated in Lake Avenue, so called, in the said Town of Greenwich and containing 14½ acres more or less.

Bounded Northerly by land of Adam Shredders, Easterly by the highway, Southerly by land of R. C. Jones and Westerly by land of James Sweeney.

Together with all right, title and interest in and to the highway, Lake Avenue, in front of and adjoining said premises to the center line thereof.

Being the same premises conveyed to the Grantor herein by Marie A. Wood by Warranty Deed dated December 30, 1916 and recorded in Book 158, Page 126 of the Greenwich Land Records.

In Presence of:  

(Signed) Henry G. Drinkwater, J.S.

W. C. Dungee, Notary Public.

14½ Acres
STORMWATER MANAGEMENT REPORT

4 Lot Residential Subdivision
Lake Avenue and Cherry Valley Road
Greenwich, Connecticut
Greenwich Inland Wetlands Application

Prepared for:
Aquarion Water Company
835 Main Street
Bridgeport, Connecticut 06604

Prepared by:

Luchs
Consulting Engineers

Assisting:
Dymar Corp.
Southbury, CT 06488

June 24, 2020
Engineer of Record Certification

Project Name: Aquarion Water Company - 4 Lot Subdivision
Project Address: Lake Avenue and Cherry Valley Road
Engineer's Name: Terrance Gallagher, P.E.
Engineering Firm's Name: Lucha Consulting Engineers
Street Address: 89 Colony Street City: Meriden State: CT Zip: 06451
Phone: (203) 379-0320 x242 Fax: (203) 379-0278
Email: tgallagher@lucha.com

The undersigned Registered Professional Engineer of Record certifies that the Stormwater Management Report and Plans submitted herewith entitled:

Stormwater Management Report; 4 Lot Residential Subdivision, Lake Ave & Cherry Valley Road,
Prepared for Aquarion Water Company & Dymar Corp.

Stormwater Management Report Last Revision Date: June 24, 2020
Number of Plan Sheets: Last Revision Date:


Engineer's Signature: Terrance Gallagher Date: 06/24/20

[State of Connecticut Engineer's Seal]

Form SC-100 February 2014
Engineer of Record Certification

Project Name: Aquarion Water Company 4 Lot Residential Subdivision
Project Address: Lake Avenue and Cherry Valley Road
Engineer’s Name: Mark E. Lancor, P.E.
Engineering Firm’s Name: DYMAR Corp.

Street Address: 800 Main Street South  City: Southbury  State: CT  Zip: 06488
Phone: 203-267-1046  Fax: 203-267-1547  Email: melancor@dymarinc.com

The undersigned Registered Professional Engineer of Record certifies that the Stormwater Management Report and Plans submitted herewith entitled:

4 Lot Residential Subdivision, Lake Avenue and Cherry Valley Road

Stormwater Management Report Last Revision Date: 6-24-20 as Prepared by Luchs Engineers, Meriden CT
Number of Plan Sheets: 18  Last Revision Date: 6-24-20


Engineer’s Signature  Mark E. Lancor  Date 6-24-20

Engineer’s Seal
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1.0 PROJECT NARRATIVE

1.1 Project Overview

Aquarion Water Company (AWC) is subdividing an 80.271 ac. parcel of Class III watershed land in Greenwich, Connecticut. An additional 18+ acre parcel of Class I and II lands will be retained by AWC. The parcel is located north of the Merritt Parkway and is bounded by Lake Avenue on the east, Old Mill Road North on the south side, and Cherry Valley Road on the west. The property lies within the watershed for Converse Pond Brook.

The majority of the Class III property (approximately 72.3 acres) is being conveyed to the Greenwich Land Trust with a conservation easement being conveyed to the Town of Greenwich for open space purposes. Aquarion is subdividing out two – 4 acre building lots in the southwest corner of the parcel for residential use. The property is zoned RA-4. Access is from proposed driveways off Cherry Valley Road. The lots will be served by on-site wells and subsurface sewage disposal systems.

The property contains a number of inland wetlands that were delineated by William Kenney Associates and surveyed by Ochman Associates, Inc.. Refer to the Plan Set prepared by DyMar Corp. dated June 18, 2020 for additional information.

This report analyzes the drainage impacts from the two proposed lots, and documents compliance with Greenwich Low Impact Development (LID) and Stormwater Management Manual.

1.2 Stormwater Management Standards Narrative

Low Impact Development (LID) methods have been used in preparing the proposed plans in keeping with Town of Greenwich requirements.

1.3 Protection of Natural Hydrology

Most of the property is being preserved as open space along Converse Pond Brook and the associated wetlands. The areas that are being developed for two lots are primarily wooded uplands along Cherry Valley Road. Grading and drainage on both lots maintains existing drainage patterns. The access driveway on Lot #2 has 3 culverts conveying runoff where existing wetlands are being crossed to maintain the existing drainage patterns. Development plans contain a variety of
stormwater Best Management Practices that are designed to promote infiltration, and distribute runoff to the downhill wetlands in a diffuse pattern that mirrors existing conditions.

1.4 **Stormwater Best Management Practices:**

The residential project has designed using Low Impact Development (LID) methods in keeping with Town of Greenwich and Connecticut Department of Energy and Environmental Protection guidelines. Some of the BMP’s used on this application include:

1.4.1 **Land Preservation:**

Preservation of most of the property (72.3 ac.) as open space being conveyed to the Greenwich Land Trust in favor of a conservation easement being conveyed to the Town of Greenwich.

1.4.2 **Lot 1:**

- Maintaining existing drainage patterns.
- Limited clearing and grading.
- Porous Paver Driveway for groundwater recharge.
- Porous Patio around swimming pool. A porous concrete patio with a crushed stone base was assumed for design.
- Porous walks are used.
- Pervious Decks are used around rear of house.
- Detention Galleries for groundwater recharge from building roof and other areas.
- Level Spreader at the stormwater outlet to diffuse point discharges and avoid erosion.
- Existing stone walls being maintained.
- Tree protection measures incorporated into sediment and erosion controls.
- Amended soils are being used.

1.4.3 **Lot 2:**

- Maintaining existing drainage patterns.
- Crushed Stone Infiltration Trenches along driveway to infiltrate runoff. No curbs are proposed for most of driveway.
- Grass swales to direct runoff along driveway.
- Porous Pavers used for Driveway and Parking near house.
- Porous Patio around swimming pool. A porous concrete patio with a crushed stone base was assumed for design.
- Pervious Decks are used around rear of house
- Rain Gardens (3) are proposed to collect runoff from house, parking and drives.
- Detention Galleries for groundwater recharge from building roof and other areas.
- Level Spreader at the stormwater outlet to diffuse point discharges and avoid erosion.
- Stone walls are being rebuilt to match existing drainage patterns.
- Tree protection measures incorporated into sediment and erosion controls.
- Amended Soils are being used.

1.5 **Credits for LID BMP's**

The project is applying for use of LID BMP’s noted above. All of the developed areas on both lots drain through one or more of the various LID BMP’s. Refer to drawings C10A & C10B Low Impact Development Plans by DyMar for location of the various BMPs.

2.0 **Stormwater Management Plans and Analysis**

2.1 **Existing vs. Proposed Hydrology Summary**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Q1 Yr. Storm (cfs)</th>
<th>Q2 Yr. Storm (cfs)</th>
<th>Q5 Yr. Storm (cfs)</th>
<th>Q10 Yr. Storm (cfs)</th>
<th>Q25 Yr. Storm (cfs)</th>
<th>Q50 Yr. Storm (cfs)</th>
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<td>+1.82</td>
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<td>1.38</td>
<td>2.55</td>
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<td>13.18</td>
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<tr>
<td>Proposed with LID BMP's</td>
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<td>2.42</td>
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<td>-5.1%</td>
<td>-3.6%</td>
<td>-4.4%</td>
<td>-5.2%</td>
<td>+2.0%</td>
<td>-1.4%</td>
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</table>
The existing conditions model (19037 Dymar EX-1.hcp) analyzed both lots and the total to the eastern property line of the proposed development. Refer to Drawing DA-1 Existing Drainage Basins in Appendix B for locations.

The proposed conditions model (19037 Dymar PR-1.hcp) analyzed both lots and the resulting totals assuming conventional development without any stormwater BMP's. This was used to evaluate Runoff Reduction Volume (RRV) effectiveness of the LID BMP’s. Refer to Drawing DA-2 Proposed Drainage Basins in Appendix B for tributary watersheds.

LID Design calculations are enclosed in Appendix C.

The proposed conditions HydroCAD model (19037 Dymar PR-2.hcp) incorporating all the LID BMP’s and recharge galleries. That analysis demonstrates that there is no increase in peak runoff rates from the proposed development. See Table 1 above and Appendix B for additional information.

2.2 Hydrology Methods

The site was analyzed using HydroCAD Computer Program, which is based on using the U.S. National Resource Conservation Service Hydrology Methods (formerly TR-20). The pre and post development analysis was prepared for:

- TR-20 analysis using HydroCAD ver. 10 Hydrology Program by HydroCAD Software Solutions, LLC
  - Q = flow (cfs)
  - A = area (ac.)
  - CN = curve number
- 24 Hour Duration Storms using a Type III SCS Rainfall Distribution
- Antecedent Moisture Condition (AMC) = 2 (moist)
- The 1, 2, 5, 10, 25, 50 and 100 Year Storms were analyzed using the rainfall amounts listed in the Greenwich Stormwater Manual
- 24 Hour Storm Durations
- Time of Concentration: NRCS Method
  - 8 min. minimum - all areas
- 15 min. minimum - areas that were primarily treed or landscaped

The Existing Conditions analyzed were for the current property conditions. The soils are primarily Hydrologic Soil Group B as identified by the NRCS study and confirmed by William Kenney Associates. Refer to Appendix A: Soils for additional information.

The Proposed Conditions analysis without BMP’s does not take into account the impact of LID BMP or detention system. That analysis assumes that there are no stormwater BMP’s.

The Proposed Conditions analysis with BMP’s (19037 Dymar PR-2.hcp) performs a reservoir routing of all the LID BMP’s to verify reductions of peak runoff rates. Appendix B contains summary tables of all the Areas and Curve Numbers for the various LID BMP areas.

2.3 **Land Use Regulations**

The project has been developed in accordance with the Greenwich Drainage Manual as part of a Greenwich Inland Wetlands application.

The project will also be seeking a subdivision approval from the Greenwich Planning & Zoning Commission, which will have a staff report from the Greenwich Engineering Department, and the Greenwich Health Department.

2.4 **Site Inventory and Evaluation**

Refer to Drawings C-2 & C-3 of the plan set for existing natural resource information and potential impact analysis. The tree survey and FEMA Flood Lines can be also found on plans prepared by Ochman Associates, Inc. sheets C-2 and C-3A, respectively.

2.5 **Define Development Envelope**

Refer to Drawings C4A & C4B for lot development and grading. These plans show the location of the stormwater systems. Other plans in the drawing set show the tree preservation and construction staging areas.

The upland soils on both lots are Hydrologic Class B; Charlton-Chatfield Soils, and are noted on Drawing C-2. Additional soils information is included in Appendix A: Soils.
2.6 **LID Control Strategies**

Various LID BMP’s have been incorporated into both lots, as noted previously.

Existing and Proposed hydrology calculations are included in Appendix B: Hydrology.

LID analysis calculations are included in Appendix C.

The two lots contain LID BMP’s in a treatment train approach using the “Static” design method to size stormwater volumes for proposed designs. Where possible, all directly connected impervious areas discharge to some infiltration BMP, such as a rain garden or recharge gallery prior to overflow. Vegetated BMP’s such as grass swales and rain gardens were used, where possible.

Lot 1 is a more compact layout than Lot 2 due to the location near Cherry Valley Road. Lot 2 contains a variety of BMP’s along the access drive; no curb, infiltration trenches, grass swales, rain gardens, as well as BMP’s around the house site for control of runoff from all impervious areas.

2.7 **Structural BMP’s**

2.7.1 **Water Quality Volume and TSS Removal**

<table>
<thead>
<tr>
<th>Location</th>
<th>WQV_req'd (cf)</th>
<th>WQV_prv'd (cf)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot 1</td>
<td>898</td>
<td>1,394</td>
<td>OK</td>
</tr>
<tr>
<td>Lot 2</td>
<td>2,723</td>
<td>5,485</td>
<td>OK</td>
</tr>
</tbody>
</table>

The proposed Water Quality Volumes exceed required amounts based on the “Static” design method. Refer to Appendix C for calculations.

This analysis may be conservative because an 8” thick stone reservoir under porous pavement areas, and the detail on Drawing C-8A has a thicker base of 18".
The porous concrete patios around the pools assumed a 6” thick crushed stone base. Refer to Appendix C: LID Analysis for additional information.

The BMP’s storage capacity would exceed that required for the 80% Total Suspended Solids (TSS) removal outlined in the Drainage Manual. Refer to Appendix C for calculations.

2.7.2 Runoff Reduction Volume

The volume of a 1 Year, 24 Hour Storm was compared for each lot, assuming no BMP’s for proposed conditions.

<table>
<thead>
<tr>
<th>Location</th>
<th>Existing Volume (ac-ft)</th>
<th>Proposed Volume (ac-ft)</th>
<th>RRV (cf)</th>
<th>Vol. Provided (cf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot 1</td>
<td>0.093</td>
<td>0.126</td>
<td>1,440</td>
<td>3,340</td>
</tr>
<tr>
<td>Lot 2</td>
<td>0.130</td>
<td>0.159</td>
<td>1,265</td>
<td>5,485</td>
</tr>
</tbody>
</table>

The proposed volume provided includes the volume of all the LID BMP’s'. Refer to Appendix C for calculations.

Rain Gardens were assumed to have 6” of ponding depth (PD) and 18” of sandy soil depth (SD).

2.7.3 Groundwater Recharge Volume

The groundwater recharge volume requirement is also being met by the storage volumes in the LID BMP’s.

<table>
<thead>
<tr>
<th>Location</th>
<th>GRV req’d (cf)</th>
<th>GRV prv’d (cf)</th>
<th>Status</th>
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</thead>
<tbody>
<tr>
<td>Lot 1</td>
<td>127</td>
<td>1,394</td>
<td>OK</td>
</tr>
<tr>
<td>Lot 2</td>
<td>368</td>
<td>5,485</td>
<td>OK</td>
</tr>
</tbody>
</table>
2.7.4 Peak Flow Control

Both lots are equipped with underground detention galleries in addition to the other LID BMP’s. The galleries are equipped with orifices designed to restrict peak flow rates. The proposed conditions HydroCAD model (19037 Dymar PR-2.hcp) incorporates all the LID BMP’s.

Refer to Appendix B for additional information on LID compliance.

3.0 Conclusion

The development of the proposed two new building lots will result in a small increase in runoff volume and peak flow rate toward Converse Pond Brook if no stormwater measures were proposed. A series of LID BMP’s is proposed for those two lots, and those BMP’s will offset any impacts from the proposed development to the Brook and downstream properties. No diversions of runoff patterns are proposed, and a large amount of open space will be acquired by the Town as part of the subdivision.

The proposed development will meet the requirements of the Town of Greenwich’s Drainage Manual, specifically for: Groundwater Recharge, Runoff Reduction, TSS Removal, Water Quality Volumes, Peak Flow Rate, Peak Velocities, and Sediment and Erosion Controls during construction.

Refer to Appendix D for compliance with the elements of the “Stormwater Management Standards Narrative.”
DESIGN STANDARDS & REFERENCES

The following standards and references were used in preparation of the proposed plans and Stormwater Report:

- **Town of Greenwich Drainage Manual revised thru June 2019.**
- **Connecticut Stormwater Quality Manual, Connecticut Department of Environmental Protection, 2004, with LID Addendum.**
- **Soil & Erosion Control Guidelines, Connecticut Council on Environmental Quality, 2002, with LID Addendum**
NOTES:


2. Parcel is in Zone RA-4.

3. Property is shown as Parcel ID 10-1255

4. Parcel is in FIRM Zone AE, Zone X (Shaded) and Zone X (Unshaded) on Map No. 09001C0482F. Effective Date June 18, 2010.

5. Owner of Record: Aquarion Water Company of Connecticut

6. Underground utility, excavation and facility locations depicted and related herein have been compiled, in part, from record mapping supplied by the respective utility companies or governmental agencies. Such locations can be different than the actual physical locations of such utilities, excavation and facilities. Such locations are approximate and are subject to design and construction. The existence and location of the utility, excavation and facilities information herein is believed to be correct and complete as of the date of such mapping and is based on information and data provided to Ochman Associates Inc. The exact location and existence of such items are unknown to Ochman Associates Inc. The size, location and existence of all such items must be verified by the appropriate authorities prior to construction. CALL BEFORE YOU DIG 1-800-922-4455.

7. Photogrametric Mapping provided by Golden Aerial Surveys Inc. Imagery (provided July 18, 2019).

8. Gray Datum MVD(SDV).

NOTES:
2. Parcel is in Zone RA-4.
3. Property is shown as Parcel ID 10-1255.
4. Parcel is in FIRM Zone AE, Zone X (Shaded) and Zone X (Unshaded) on Map No. 09001C0482F. Effective Date June 18, 2010.
5. Owner of Record: Aquarion Water Company of Connecticut.
6. Underground utility, structure and facility locations depicted and related features shown are for planning purposes only and may not be in the correct location or at the correct distance. These locations MUST be considered approximate in nature. Additionally, other such features may exist on the site, the existence of which is unknown to Ochman Associates, Inc. The size, location and existence of all such features must be field determined and verified by the appropriate authorities prior to construction. CALL BEFORE YOU DIG 1-800-922-4455.
7. Photogrammetric Mapping provided by Golden Aerial Surveys Inc. Imagery (provided July 18, 2019).
8. Vertical Datum NAVD(88).

LEGEND
Existing Contour
Existing Spot Elevation
FEMA 100 Year Flood Zone
FEMA 500 Year Flood Zone
Watershed Division Line
100’ Upland Review Area
Wetland Flags for Class III Land Only

TREE SPECIES CODE:

- Ash (As)
- Beech (Be)
- Birch (Bi)
- Cherry (Ch)
- Oak (Oa)
- Hickory (Hck)
- Locust (Lo)
- Maple (Ma)
- Tulip (Tp)

SIGHT DISTANCE /
PLAN & PROFILE

PREPARED FOR:
AQUARION WATER COMPANY
OF CONNECTICUT

836 LAKE AVENUE
GREENWICH, CONNECTICUT
JUNE 16, 2020

OCHMAN ASSOCIATES, INC.
CONSULTING ENGINEERS & SURVEYORS
P.O. BOX 76
EASTON, CONNECTICUT 06612
PHONE (203) 268-9194
4 LOT RESIDENTIAL SUBDIVISION
LAKE AVENUE AND CHERRY VALLEY ROAD
GREENWICH, CONNECTICUT
Sequence of Construction

Lot Dewatering, Infrastructure and House Construction

1. Layout clear limit lines, tag trees to be saved and install tree protection
2. Clear and grub limit lines
3. Backfill tracking pad, site lines, straw waddles and fill area per plan
4. Strip-seeded for drive cross sections and culverts as shown
5. Install protective fencing around sensitive areas and systems
6. Rough grade site and import clean and amended fills required for infiltration systems
7. Layout foundation and excavate for footings and walls, including pool area
8. Pour concrete for footings, install tracking pad and create fill
9. Complete rough grade of cuts and fills, including additional import clean fill and amended fill
10. Complete house framing and weather tight construction of windows, roofing, walls, including pool area
11. Install utilities, septic, well, drainage and infiltration systems
12. Complete House and pool construction
13. Complete box out for drive and garage area to subgrade; complete installation of driveways, concrete, and pavement; pour footing and backfill
14. Complete fine grading of the site; rest topsoil and mulch restoration for lawns and landscaping
15. Upon completion of site, remove sift fines and any remaining erosion and sediment protection

General Notes:

1. Reference is made to Sheets C6C-6E for additional Erosion and Sedimentation control specifications and details.
2. Monitoring of erosion and sediment controls shall be done weekly by a certified erosion and sedimentation control specialist or professional engineer, provide reports as required by the Town. If additional controls are required than shown, the contractor shall provide them as directed. Any deviation of the plan approved by the Town shall be submitted to the Town for review prior to construction.
3. Review prior to construction.
4. Natural Vegetation shall be maintained and protected as is reasonably possible.
5. An additional 10% of trap rock and gravel, hay bales, straw waddles, snow fencing and soil tiers shall be maintained at the site at all times.
Sequence of Construction

Phase 1 – Completion of 480 feet 1/2 of Access Drive

1. Layout clear limit lines, tag lines to be used and install tree protection
2. Clear and grub to limit lines to edges, 15-60 ft.
3. Install tracking pad, site lines, minor utilities and EQAR controls per plan
4. Strip topsoil for drive cross section, load and stockpile as shown
5. Install temporary lowering pit and dirt bag in vicinity of P.31
6. Install cross slope pipes complete with inlet and outlet local upducers
7. Complete drive to original, importing clean fill and amended fill material to
   Reapir to station 13+80, including construction of walls to reposition
   cross draining pipe culverts
8. Install temporary lowering pit and dirt bag for regrade crossing at drive
   Station 13+00; install YD #1 and both cross pipe culverts complete
9. Complete drive to original, importing clean fill as required to station
10. Install temporary lowering pit and dirt bag for regrade crossing at drive
    Station 12+80; install cross pipe culverts and end wells complete with inlet
    and outlet protection
11. Complete drive to subgrade at station 12+40 +/-; install utilities
12. Compact subgrade and complete box out of drive; remove tracking pad, install
    processed subbase
13. Install 3' wide goodwill shoulder infiltration trench on both shoulders
14. Grade grass mounds and topsoil, install and topsoil edges to limits of
    disturbance; provide erosion blanket on slopes greater than 4:1
15. Install atlanta drainage systems for ditch
16. Place and compact Reinforcement (F.T.I.)

Phase 1 – Completion of Access Drive and House Construction

1. Layout clear limit lines for balance of site, tag lines and install tree protection
2. Clear and grub site
3. Install tracking pad and site fence
4. Strip topsoil to clear limits and stockpile as shown
5. Rough grade site and construct a temporary sedimentation basin in area of
   rain garden #2B; provide temporary stone faced drainage swales as required
6. Install protective barrier around apron, driveway area
7. Lay topsoil and formulate for berms and grade, including property
8. Fill from cuts and provide additional import clean fill and amended fill for area
    out of foundation
9. Complete house framing and weather tight construction of windows, roofing
    and siding
10. Install septa, wells and drain fields and infiltration systems, and rain gardens #2A
11. Complete box out for drive and grading into subgrade; complete installation
    of utilities
12. Complete House and pool construction
13. Complete final grading of the site; install and maintain vegetation for lawns
    and borders areas
14. Complete temporary sedimentation basin and complete construction/specification
    of rain gardens #2B
15. Upon stabilization of site, remove silt fence and any remaining erosion and
    sedimentation controls

General Notes:

1. Reference is made to Flans (O-S-0) for additional Excavation and Sedimentation
   control specifications and details
2. Monitoring of sedimentation and erosion controls shall be done weekly by a
   certified erosion control specialist or professional engineer; provide reports as
   required by the Town. If additional controls are required than shown, the
   contractor shall provide them as directed. Any deviation of the plan approved
   by the Town shall require prior approval by the engineer.
3. In accordance with Section 6-153.1 of the Town Building Zone Regulations, a
   Plan of Erosion, Sedimentation and Stormwater Control Plan shall be submitted to the Town for
   approval prior to commencement of work
4. Natural Vegetation shall be maintained and protected as is reasonably possible.
5. At an additional 10% of top soil and gravel, hay bales, stone wall face, more
   fencing and silt fence shall be maintained at the site at all times
EARTH WORK SPECIFICATIONS

1. GENERAL

1.1. Bearing in mind that the specifications herein stated are for the guidance and information of the Bidders, and in no way form part of the terms and conditions of this Contract, the Bidders will be assumed to have provided for every detail not specifically specified herein.

1.2. The details provided herein are intended to indicate the quality and nature of materials and workmanship, and the work to be done. They are not to be interpreted as indicating a preference for any material, method, or procedure, or as limiting the discretion of the owner in the matter of estimation and specification, or as affecting the basis of the contract price.

1.3. Materials and labor shall be furnished and used in the manner and in the quality described herein, and the Contractor shall construct, excavate, and construct work in strict accordance with the plans and specifications for the work. If the materials and workmanship are not in accordance with specifications and plans, as determined by the owner or their agent, the Contractor shall, at their own cost, make such repairs and changes in work as are necessary to make the materials and workmanship conform to specifications and plans.

1.4. Materials shall be used in such quantity and in such proportions as are necessary to accomplish the work in accordance with specifications and plans.

1.5. The Contractor shall furnish all labor, materials, equipment, and supervision necessary to perform the work described herein.

1.6. The Contractor shall perform the work in a good and workmanlike manner and shall ensure that all materials and labor conform to specifications and plans.

1.7. The Contractor shall perform all work in good faith and in accordance with the plans and specifications, and shall not be responsible for any delays or difficulties due to acts of God or unforeseen circumstances.

2. SPECIFICATIONS

2.1. The plans and specifications for the work are in accordance with the requirements of the owner.

2.2. The specifications shall be subject to the owner's approval, and the Contractor shall perform all work in accordance with the plans and specifications.

2.3. The owner reserves the right to make changes in the plans and specifications at any time.

2.4. The owner reserves the right to reject all or any portion of the work if it is not in accordance with the plans and specifications.

2.5. The Contractor shall furnish all labor, materials, equipment, and supervision necessary to perform the work described herein.

2.6. The Contractor shall perform all work in a good and workmanlike manner and shall ensure that all materials and labor conform to specifications and plans.

2.7. The Contractor shall perform all work in good faith and in accordance with the plans and specifications, and shall not be responsible for any delays or difficulties due to acts of God or unforeseen circumstances.

2.8. The Contractor shall perform all work in accordance with the plans and specifications, and shall not be responsible for any delays or difficulties due to acts of God or unforeseen circumstances.

3. CONSTRUCTION

3.1. The Contractor shall construct the work in accordance with the plans and specifications.

3.2. The Contractor shall be responsible for the work performed by the Contractor and its subcontractors.

3.3. The Contractor shall furnish all labor, materials, equipment, and supervision necessary to perform the work described herein.

3.4. The Contractor shall perform all work in a good and workmanlike manner and shall ensure that all materials and labor conform to specifications and plans.

3.5. The Contractor shall perform all work in good faith and in accordance with the plans and specifications, and shall not be responsible for any delays or difficulties due to acts of God or unforeseen circumstances.

4. ACCEPTANCE

4.1. The owner or their agent shall have the right to inspect all materials and workmanship at any time during the progress of the work.

4.2. The owner or their agent shall have the right to reject all or any portion of the work if it is not in accordance with the plans and specifications.

4.3. The owner or their agent shall have the right to require the Contractor to remove and replace any materials or workmanship which is not in accordance with the plans and specifications.

4.4. The owner or their agent shall have the right to require the Contractor to perform any additional work which is necessary to make the materials and workmanship conform to the plans and specifications.

4.5. The owner or their agent shall have the right to require the Contractor to make any changes in the work which are necessary to make the materials and workmanship conform to the plans and specifications.

5. PAYMENTS

5.1. The owner shall pay the Contractor for the work performed in accordance with the plans and specifications.

5.2. The owner shall pay the Contractor in accordance with the terms and conditions of the contract.

5.3. The owner shall pay the Contractor in accordance with the terms and conditions of the contract, and shall not be responsible for any delays or difficulties due to acts of God or unforeseen circumstances.

5.4. The owner shall pay the Contractor in accordance with the terms and conditions of the contract, and shall not be responsible for any delays or difficulties due to acts of God or unforeseen circumstances.

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5.7. The owner shall pay the Contractor in accordance with the terms and conditions of the contract, and shall not be responsible for any delays or difficulties due to acts of God or unforeseen circumstances.

5.8. The owner shall pay the Contractor in accordance with the terms and conditions of the contract, and shall not be responsible for any delays or difficulties due to acts of God or unforeseen circumstances.

6. RECORDS

6.1. The Contractor shall keep accurate records of all materials and labor used in the performance of the work.

6.2. The Contractor shall keep accurate records of all materials and labor used in the performance of the work.

6.3. The Contractor shall keep accurate records of all materials and labor used in the performance of the work.

6.4. The Contractor shall keep accurate records of all materials and labor used in the performance of the work.

6.5. The Contractor shall keep accurate records of all materials and labor used in the performance of the work.

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6.7. The Contractor shall keep accurate records of all materials and labor used in the performance of the work.

6.8. The Contractor shall keep accurate records of all materials and labor used in the performance of the work.

6.9. The Contractor shall keep accurate records of all materials and labor used in the performance of the work.

6.10. The Contractor shall keep accurate records of all materials and labor used in the performance of the work.

6.11. The Contractor shall keep accurate records of all materials and labor used in the performance of the work.

7. COMPLIANCE

7.1. The Contractor shall comply with all laws and regulations applicable to the performance of the work.

7.2. The Contractor shall comply with all laws and regulations applicable to the performance of the work.

7.3. The Contractor shall comply with all laws and regulations applicable to the performance of the work.

7.4. The Contractor shall comply with all laws and regulations applicable to the performance of the work.

7.5. The Contractor shall comply with all laws and regulations applicable to the performance of the work.

7.6. The Contractor shall comply with all laws and regulations applicable to the performance of the work.

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7.8. The Contractor shall comply with all laws and regulations applicable to the performance of the work.

7.9. The Contractor shall comply with all laws and regulations applicable to the performance of the work.

7.10. The Contractor shall comply with all laws and regulations applicable to the performance of the work.

7.11. The Contractor shall comply with all laws and regulations applicable to the performance of the work.

8. DISPUTE RESOLUTION

8.1. Any dispute arising out of or relating to the work shall be resolved through arbitration in accordance with the rules of the American Arbitration Association.

8.2. Any dispute arising out of or relating to the work shall be resolved through arbitration in accordance with the rules of the American Arbitration Association.

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8.11. Any dispute arising out of or relating to the work shall be resolved through arbitration in accordance with the rules of the American Arbitration Association.

9. TERMINATION

9.1. The owner may terminate the contract for default or non-performance of the contractor.

9.2. The owner may terminate the contract for default or non-performance of the contractor.

9.3. The owner may terminate the contract for default or non-performance of the contractor.

9.4. The owner may terminate the contract for default or non-performance of the contractor.

9.5. The owner may terminate the contract for default or non-performance of the contractor.

9.6. The owner may terminate the contract for default or non-performance of the contractor.

9.7. The owner may terminate the contract for default or non-performance of the contractor.

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9.11. The owner may terminate the contract for default or non-performance of the contractor.
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Appendix C  Natural Diversity Database Determination Letter
1.0 INTRODUCTION

On behalf of Aquarion Water Company of Connecticut (Aquarion), William Kenny Associates LLC (WKA) investigated a portion of an approximate 98-acre property located in Greenwich, Connecticut to conduct an ecological assessment to inventory and evaluate existing and proposed conditions of onsite natural resources including wetlands, watercourses, wildlife and their habitat, soils, and geologic and hydrologic conditions. Approximately 80.3 acres were assessed by WKA (Figure 1). The work was completed through the review of publications and public agency databases, as well as several onsite investigations. Field investigations were completed in April and May of 2019. WKA identified two upland forest ecological communities and four wetland and watercourse communities, including four vernal pools. Proposed conditions were assessed based on a review of the 4 Lot Residential Subdivision plan set prepared by Dymar, Inc., last revised June 24, 2020. One lot is an approximate 72-acre area of forested wetlands, watercourses and upland areas that will be preserved as Open Space through the Greenwich Land Trust. Two residential lots are proposed in the southwestern portion of the property. Each lot is approximately 4 acres and includes one single-family dwelling, garage, drive, pool, pool deck, deck and related site improvements. An approximate 18-acre lot in the northeastern portion of the property will remain Aquarion property. This lot was not investigated by WKA for the purposes of this project. William L. Kenny, Timothy F. Veit and Carolyn H. Matthews completed the ecological assessment and the preparation of this report. Resumes for these individuals are provided in Appendix A.

In summary, we find that the property will result in the permanent protection of significant inland wetlands and watercourses and adjacent upland areas with only minor wetland disturbance. Approximately 72 acres of forested wetlands, watercourses and upland areas will be protected in perpetuity as Open Space and approximately 0.75 acres of habitat will be enhanced on the residential lots. In addition, best management practices will be employed during and following construction to prevent indirect impacts to wetlands and watercourses from the two proposed residential properties. Wetland loss (approximately 0.05 acres) is unavoidable and will be minimized to the greatest extent practicable. No other wetlands or watercourses will be impacted by proposed activity and most improvements are proposed outside the 100-foot Regulated Upland Review Area (RURA).
FIGURE 1: PROJECT LOCATION MAP
2.0 SITE LOCATION, SURROUNDINGS & LAND USE

The approximate 80.3-acre investigated area is located in the southwestern portion of Fairfield County in Greenwich, Connecticut (Figure 1). The property is undeveloped and is surrounded by residential properties to the north, east and west. Lake Avenue borders the property to the east and Cherry Valley Road borders the property to the southwest. Old Mill Road and the Merritt Parkway are south of the property. Access to the property is gained from Cherry Valley Road, Old Mill Road North and Lake Avenue. The property consists of forest and woodland areas and wetlands and watercourses. Several historic stonewalls are present throughout the property and there are two horse-riding trails in the western portion of the property, extending from north to the south.

3.0 HYDROGEOLOGIC CONDITIONS

3.1 Landform and Drainage

The property is located in the southwestern portion of the Southern New England Coastal Plains and Hills ecoregion of Connecticut, in close proximity to the transition to the Long Island Sound Coastal Lowland. Ecoregions are specific regions that differ primarily based on location, climate and geomorphic conditions. There are eight ecoregions in Connecticut. The Southern New England Coastal Plains and Hills ecoregion is located in both the eastern and western portions of the state, on either side of the Connecticut Valley, and is characterized by its diverse elevations and landforms. The Long Island Sound Coastal Lowland encompasses the entire southern border of Connecticut along the Long Island Sound. This ecoregion is characterized by its relatively mild climate (due to its close proximity to the Long Island Sound) and its low elevations.

The property contains a valley that extends north to south through the western portion of the property. Converse Pond Brook extends and flows north to south through the valley. The western side of the valley is steeply sloped, decreasing in elevation from the western property boundary down to Converse Pond Brook (approximately a 70-foot change in elevation). East of the brook, the site is relatively level and moderately increases in elevation towards the eastern property boundary. As such, the majority of surface and subsurface water at the site drains into Converse Pond Brook.
The property lies within the watershed of the Byram River watershed, which drains to the Long Island Sound approximately 7.5 miles southwest of the site. The brook exits the property in the southwest corner of the site and joins the Byram River approximately 2.5 miles downstream. The Byram River is a class B stream per the CT DEEP. As such, its designated uses are recreation, fish and wildlife habitat, navigation and agricultural and industrial water supply.

3.2 Geology

The study area is located in the Iapetos (Oceanic) Geologic Terrane of the Western Uplands of Connecticut. Metamorphic gneiss and schist rocks that formed from oceanic deposits characterize the Iapetos Terrane. According to the Bedrock Geology Map of Connecticut, (Rodgers, 1985), the site is underlain by grey to silvery, partly rusty weathered, medium grained well layered schist and gneiss rocks composed of quartz, biotite, muscovite and garnet of the Trap Falls Formation. The eastern side of the of the site contains several bedrock outcroppings along the slope. The bedrock geology in the western and central portions of the property has very limited effect on the ecological conditions as the bedrock is overlain with a relatively thick layer of unconsolidated surficial materials.

The primary surficial materials at the site consist of loose and compact glacial till, glaciofluvial deposits and alluvium (Stone et al., 1992). Glacial till is unsorted material of various sizes (clay particles to boulders) and shapes that were transported and deposited by glacial ice. Two major types of till are onsite: lodgement and ablation till. Ablation till is deposited by melting ice at the margins of the glacier and does not include compacted layers. Lodgement till includes compacted layers that usually begin 20 to 30 inches below the surface and continue with depth. Because of the compacted layers, groundwater may intermittently perch directly above the layers. Glacial outwash is also present in the western portion of the site and consists of sand and gravel that was deposited by water running from melting glaciers. Lastly, surficial materials in several portions of the wetland adjacent to Conserve Pond Brook are derived from alluvial deposits, which are loose, unconsolidated materials, mainly stratified sand and silt, deposited by post-glacial streams.
3.3 Soils

A variety of soil types are found at the study area. The soils differ primarily based on their slope (nearly level to 40 percent), drainage class (well drained to very poorly drained) and parent material (glacial till, glacial outwash and alluvium). The onsite soil conditions are common in this area. The location and scope of these soil types were mapped (Figure 2) and reveal a general agreement with the survey published by US Natural Resource Conservation Service. Soil types found at the study area and their primary characteristics are noted in Table 1.

<table>
<thead>
<tr>
<th>Table 1: Soil Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Map Unit</strong></td>
</tr>
<tr>
<td>Sym.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Upland Soil</strong></td>
</tr>
<tr>
<td>21</td>
</tr>
<tr>
<td>29</td>
</tr>
<tr>
<td>50</td>
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<td><strong>Wetland Soil</strong></td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>103</td>
</tr>
</tbody>
</table>
4.0 ECOLOGICAL COMMUNITIES

Six distinct ecological communities were identified at the property (Figure 3), distinguished by primary vegetative cover type. These communities are comprised of upland (U) and wetland (W) communities that are common to the region based on the classification of ecological communities through the New York National Heritage Program (NYNHP). The symbol, size and name of each community are provided in Figure 3.

An ecological community is “a variable assemblage of interacting plant and animal populations that share a common environment” (Edinger et al. 2002). Classifications of these types of systems are prevalent in the literature and allow for the presentation of information in a clear and brief format. In addition to the NYNHP descriptors, two additional classification systems were used to evaluate the onsite wetland areas: the Hydrogeomorphic (HGM) approach and the United States Fish and Wildlife Service (USFWS) system. The HGM system groups communities according to their hydrologic and geomorphic conditions and is useful for identifying and accessing the physically-based functions of wetlands. The USFWS classification system includes vegetation and other modifiers, which are useful in understanding biological (flora and fauna) aspects of wetlands. The wetland classifications for the wetland communities are provided in the Wetland and Watercourse Classifications table in Figure 4.

Ecological communities at the site were mapped using field observations and a collection of field data and remote sensed data (aerial photographs and topographic surveys). Field investigations were completed in April and May of 2019 and were conducted on foot. Observations were made while walking systematically through the property and along and within critical habitats (i.e. wetlands, watercourses and significant topographic features). The weather conditions at the time of the site investigations varied from clear to overcast and air temperatures ranged from 50 to 60 degrees Fahrenheit. Descriptions of the upland and wetland communities are presented below and their locations are shown on Figure 3. The site is comprised of approximately two-thirds upland communities (54.6 acres) and one-third regulated wetlands and/or watercourses (25.7 acres). Lists of observed vegetation and expected and observed wildlife species are provided in Appendix B.
ECOLOGICAL COMMUNITIES

<table>
<thead>
<tr>
<th>SYM</th>
<th>NAME</th>
<th>SIZE (AC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U1</td>
<td>BEECH-MAPLE WYSE FOREST</td>
<td>41.0</td>
</tr>
<tr>
<td>U2</td>
<td>OAK-TULIP FOREST</td>
<td>11.7</td>
</tr>
<tr>
<td></td>
<td><strong>SUBTOTAL</strong>:</td>
<td><strong>54.6</strong></td>
</tr>
<tr>
<td>W1</td>
<td>RED MAPLE HARDWOOD SWAMP</td>
<td>24.3</td>
</tr>
<tr>
<td>W2</td>
<td>ROCKY LEDAN WATER STREAM</td>
<td>0.8</td>
</tr>
<tr>
<td>W3</td>
<td>VERNAL POOL</td>
<td>0.7</td>
</tr>
<tr>
<td>W4</td>
<td>DITCH/ARTIFICIAL INTERMIT</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td><strong>SUBTOTAL</strong>:</td>
<td><strong>25.7</strong></td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong>:</td>
<td><strong>80.3</strong></td>
</tr>
</tbody>
</table>

ECOLOGICAL ASSESSMENT REPORT

FIGURE 3: ECOLOGICAL COMMUNITIES MAP

OWNER: AQUARIUM WATER COMPANY OF CONNECTICUT
LOCATION: LAKE AVENUE, GREENWICH, CONNECTICUT
DATE: JUNE 2020
SCALE: 1"=100'  1"=400'

REF. NO. 4178
4.1 Upland Ecological Communities

**U1 - Beech-Maple Mesic Forest**

The beech-maple mesic forest community is present in the eastern and western portions of the property. The community is characterized by hardwood canopy trees that are codominated by red maple and American beech. Northern red oak, tulip poplar, shagbark and pignut hickory, American elm, sugar maple, American hornbeam and sweet birch are also present within the community. The eastern portions of the community contain more mature beeches as compared to the western portion which has more mature red maples. Both portions have a relatively dense canopy cover (approximately 70 to 80 percent) and tree snags (many of which are ash trees) and fallen trees are present at a significant concentration of approximately three trees per acre, which provides an important habitat niche for local fauna.

The shrub layer is characterized by isolated stands of invasive species such as multiflora rose, wineberry and burning bush dispersed throughout the community. There are areas that are extremely dense with multiflora rose. Some native shrub species including spicebush, arrowwood viburnum and witch hazel are also present, and the native greenbriar is common throughout the community. Groundcover density is low and is composed of trout lily, jewelweed, Christmas fern, lady fern and sensitive fern. The forest floor is dominated by leaf litter, downed trees, and boulders and stones. Soils are predominantly fine sandy loams from glacial till deposits and surface rocks are present in a low density throughout the community. Surface rocks increase in abundance near the onsite wetlands.

The westernmost portion of this community is disturbed by human activity. Moreover, invasive tree and shrub species are encroaching from the neighboring residential properties. Norway maple is scattered throughout a beech and hickory stand, and a defined stand of Japanese angelica tree is also present. Multiflora rose, wineberry, porcelainbriar and bittersweet are very dense in this area. Garlic mustard is more abundant here than in the surrounding areas. The canopy cover is low (approximately 25 percent).
Due to the variety of vegetation and relatively undisturbed nature of much of this upland community, it has a high potential for wildlife use. The mature trees that are present within the forest provide nesting, shelter and a food source for a variety of arboreal and semi-arboreal animals and the mast crop provides a food source for white-tailed deer and turkey. Many trees contain cavities, excavated by woodpeckers or other natural means, which are utilized by a wide variety of arboreal and semi-arboreal mammals, such as white-footed deer mice, gray squirrels and red squirrels. Avian species common to these physical structures include Northern Flicker, White-breasted Nuthatch and House Wren, in addition to the sparrow hawk, screech owl, and the saw-whet owl.

The downed and standing tree boles present throughout this upland community provides a food source for a wide variety of insects and fungi. These primary producers (fungi) assist in the breakdown of organic matter, replenishing soil nutrients and completing the microbial cycle. Bacteria, while specifically decomposers, also provide a food source themselves for higher trophic level species.

**U2 - Oak-Tulip Tree Forest**

The oak-tulip tree forest is located in the central portion of the property. Though the community is similar to the beech-maple community, the density of vegetation and tree species and age class differs substantially enough to designate it as separate from its upland counterpart. In contrast to the mature maples and beech of U1, this community is dominated by mature red oaks and tulip trees. Red maples and American beech are present, but in a lower density and at a smaller size. Sweet birch, shagbark hickory, American elm and sugar maple are also present. The tree canopy is a slightly thinner at approximately 60 to 70 percent coverage.

Unlike the beech-maple forest, there is a higher abundance of invasive shrubs including privet, wineberry, multiflora rose, spicebush and burning bush distributed throughout the community. Invasive vines such as porcelainberry and oriental bittersweet, as well as the native greenbriar, are present at a low abundance. Groundcover is dominated by leaf litter, fallen trees, and surface stones, with a low abundance of Christmas and lady fern, Canadian mayflower and trout lily. Soils are primarily fine silt loams with areas of
stratified sand and gravel. Surface rocks are present in low density throughout the community, though their density increases in abundance in proximity to the wetland communities. This community offers habitat opportunities consistent with those of U1.

### 4.2 Wetland Ecological Communities

Four wetland communities were delineated at the property (Figure 4). The wetland and watercourse delineations were conducted in accordance with the laws and regulations of the Connecticut Department of Energy and Environmental Protection (CT DEEP) and the Town of Greenwich, Connecticut. The primary characteristics of these communities are identified in the *Wetland and Watercourse Community Primary Characteristics* table in Figure 4.

**W1 - Red Maple Hardwood Swamp**

The largest wetland community is present in the western, central and eastern portions of the property. This community varies in size from a couple hundred square feet to many acres. The hydrogeomorphic structure of the community is relatively flat (zero to three percent slope) in the central and eastern portions of the property and sloping (five to 20 percent) in the western portion of the property. In general, the canopy trees are uniformly distributed throughout the community and the percent canopy coverage within the western and eastern portions of the community are fairly high (approximately 80 percent). The central area of the community has a thinner tree canopy. Tree species within the community includes red maple, American elm, white ash, swamp white oak, tulip poplar, American beech, yellow birch and American hop hornbeam. Shrubs consist of spicebush, privet, winterberry and Japanese barberry. Groundcovers consist of sensitive fern, skunk cabbage, trout lily and eastern woodland sedge. Surface stone coverage is low to moderate (zero to 75 percent) within the western portion of the community and moderate to high (50 to 100 percent) in the central and eastern portions of the property. Leaf litter and organics are the dominant surficial material. Due to the stone coverage and areas of significant seasonal ponding leading to the creation of hummock formations, the microtopography is pit and mound within various portions of the community. Tree snags and fallen, decaying trees are present at a high density (greater than three per acre) in the
western and eastern portions of the property. Several old, stone farming walls extend through the community. This community offers similar wildlife opportunities as those of the upland communities. However, with the increase of downed, decaying wood, there is a greater opportunity to support fungi, bacteria and decomposers.

**W2 - Rocky Headwater Stream**

This system, known as Converse Pond Brook, originates approximately 1.75 miles north of the site at Converse Lake and enters the site from the north and extends and flows north to south in the western portion of the site. The Brook exits the site to the south, flowing beneath Old Mill Road North. Prior to entering the site, the watercourse flows through an area of relatively densely settled residential area. Onsite the brook’s width ranges between 10 to 15 feet and has a water depth between two inches to three feet. Streambed composition consists predominately of sand with gravel- and cobble-sized stone though boulder-sized stone are present in various portions of the watercourse. Aquatic vegetation within the system was not observed. Several larger, fallen trees span the Brook at numerous points within the site and woody debris is also common within the system. According to the CT DEEP Water Quality Classification Map for Greenwich, Converse Pond Brook is considered a Class A stream, indicating the Brook is a potential drinking water supply, provides fish and wildlife habitat and serves as a potential recreational resource. However, due to the stream depth it is unlikely that there is a significant presence of fish. Wetland vegetation is sparse along the stream bank, limited to areas of skunk cabbage and false hellebore, as well as several isolated areas that are heavily vegetated with shrubs including spicebush, multiflora rose, wineberry and privet.

Due to this lack of vegetation and the nature of rocky headwater streams, the capacity of the community to provide habitat opportunities for mammals and birds is limited. The stream potentially supports some small, cold water fish species such as the creek chub and common shiner, though the abundance is likely low. Microinvertebrates are also likely supported by the system and include stoneflies, midges, crayfish, caddisflies and blackflies, which are a good food source for avian species. The fallen trees are an important habitat for fungi, bacteria and other decomposers.
W3 - Vernal Pools

In April and May 2019, five depressional wetland systems with significant ponding were identified as potential vernal pools. These systems were assessed in accordance with the Connecticut Association of Wetland Scientists (CAWS) Vernal Pool Monitoring Protocol, which includes sampling with dipnets to search for free-swimming organisms and visual observation for amphibian egg-masses and immature amphibians. Based on these assessments, four of the identified systems are characterized as vernal pools (W3 in Figure 4). Determinations were made based on the presence of one or more vernal pool species, including, but not limited to, fairy shrimp, spotted salamander and wood frog.

The pools range in size from approximately 0.01 acres to 0.52 acres and maximum water depths were observed between six inches to two feet. The canopy coverage is fairly dense (approximately 70 percent) and stonewalls are present within 20 to 40 feet of the pools. Surface composition is primarily leaf litter and muck while rock coverage is moderate in and along the pool edges. Hummock formations and other microtopographic relief are present within three of the pools. Vegetation in and immediately adjacent to the pools are primarily native wetland species and include red maple, American elm, sweet pepperbush, spicebush, witch hazel, sensitive fern and skunk cabbage. Some invasive plant species are also present, such as multiflora rose, common privet and Japanese barberry.

W4 - Ditch/Artificial Intermittent Stream

This system is an artificial ditch located in the center of the property. The system is small and narrow (approximately 0.003 acres) and extends and flows east to west, originating directly adjacent to the east side of Converse Pond Brook. The western end of the ditch extends into a wetland in the central portion of the property, ultimately terminating at the edge of a large exposed face of bedrock. The system is relatively level with steeply sloped banks. At the time of the investigation, the water was approximately four feet wide and four to eight inches deep. Despite the excavation required to create the ditch, the soil profile primarily remains intact and thus the soils are poorly drained fine sandy loams formed from loose glacial till. Surface stone coverage is low. There were no aquatic plants observed in the system and there is limited vegetation along the banks.
consisting of young tree saplings and shrubs from the surrounding upland and wetland communities such as American beech, viburnum and spicebush. Fallen trees and other woody debris are also present within the system. In contrast to the rocky headwater stream, this system is slow moving and, in some areas, has standing water offering a refuge for micro-invertebrates and local aquatic fauna, including ducks observed within the system. Similar to the rocky headwater stream, the fallen trees and woody debris provide habitat opportunities for decomposers and microorganisms.

5.0 WETLAND/WATERCOURSE COMMUNITY FUNCTIONAL EVALUATION

The biophysical elements (e.g. landscape position, geology, hydrology, substrate and vegetation) of wetlands determine their functions and to what capacity they are performed. The functions they provide and the capacity of those functions vary for each individual wetland. To better understand these differences as they relate to the onsite wetlands, a functional evaluation was completed for the identified wetlands. Each wetland was assessed to determine its capacity to provide eight wetland functions:

1. Modification of groundwater discharge
2. Modification of groundwater recharge
3. Storm and floodwater storage
4. Modification of stream flow
5. Modification of water quality
6. Export of detritus
7. Contribution to abundance and diversity of wetland vegetation
8. Contribution to abundance and diversity of wetland fauna

The evaluation completed for this project was based in part on *The Rapid Assessment Procedure for Assessing Wetlands Functional Capacity* (Hollens and Magee, 1998). This method assesses the relative importance of the wetlands for performing functions and provides a logical framework for observations, a structure for standardizing results and a basis for achieving repeatable results among users. The results of the completed assessment for each wetland are provided in the *Wetland & Watercourse Community Functional Assessment* table in Figure 4.

The classification system utilized to evaluate the functionality is based on the biophysical characteristics of the wetlands, which are primarily a function of landscape position and associated hydrology. Varying vegetation cover types may be found within each of the
delineated wetland; however, the functionality of the wetlands was assessed from a broader, “macro-scale” perspective. Each wetland was evaluated as a whole, rather than segmenting it into smaller cover type parts, as the small shifts in vegetative cover types over relatively small areal extents within each wetland do not affect the overall functioning of the wetlands to the same degree as the location and associated hydrologic position of the wetland.

The capacity for the onsite wetlands to perform a wetland functions vary for each wetland and each function. These differences are due to natural (hydrogeomorphic) and human (e.g. past and current land use activities) conditions. Generally, W1, W2 and W3 are high quality systems performing most functions at a moderate to high capacity. All three contribute to the abundance and diversity of wetland flora and fauna, despite the presence of invasive vegetation. However, if left unmanaged, the invasive vegetation will continue to spread and dominate these systems. The artificial ditch, W4, is relatively small and its primary function is water conveyance.

### 6.0 ENDANGERED AND THREATENED SPECIES

The study area was investigated to determine the presence or absence of state or federal plant and animal species listed as endangered, threatened or special concern. None of these species were observed onsite; however, according to the National Diversity Database (NDDB) Maps, the property is within the general location of state and federal listed species and significant natural communities. In response to our request for further information, we received a determination letter indicating that a portion property is a protected habitat for the northern long-eared bat, the tri-colored bat and the little brown bat. All three species are listed as state endangered species and the northern long-eared bat is listed as a federally threatened species. The letter identifies restriction areas of no tree clearing without further coordination with the USFWS and includes protection strategies outside the restriction area to follow during construction activities to minimize potential impacts to the bats. Please refer to Appendix C for the full determination letter.

### 7.0 PROPOSED ACTIVITIES & POTENTIAL IMPACTS AND MITIGATION

#### 7.1 Proposed Activities

The proposed project involves the subdivision of an approximate 98-acre lot to create four separate lots: one 72-acre Open Space lot, one 18-acre lot to remain...
as Aquarion land and two 4-acre residential lots. The Open Space will be preserved as a forest owned and managed by the Greenwich Land Trust. No improvements are proposed on this lot. The Aquarion lot is in the northeastern portion of the property and no improvements are proposed related to this application. The residential lots are proposed in the southwestern portion of the property: Lot 1 to the south and Lot 2 to the north. Each lot will include a single-family dwelling, garage, drive, pool, pool deck, deck and related site improvements. Each lot will have an onsite septic system and a private well. Site grading is required to accommodate these improvements. A stormwater management plan is also included to mitigate for changes to stormwater runoff resulting from increases in impervious cover and other changes to groundcover. The plan has been designed to comply with or exceed the Town of Greenwich Drainage Manual for groundwater recharge, runoff reduction, TSS removal, water quality volumes, peak flow rates and peak velocities. Stormwater runoff will be managed via subsurface infiltration systems, rain gardens and porous pavement. Temporary control measures, such as a construction sequencing plan, a soil erosion and sediment control plan and water handling measures, are proposed during construction activity to minimize indirect adverse impacts to the wetlands and watercourses.

To reach the developable portion of Lot 2, the proposed drive will cross three small segments of the western wetlands and approximately 0.05 acres of wetlands will be permanently lost. Adverse impacts to the system have been minimized through the design and location of the drive. The primary compensation for the loss is the protection of 72 acres of mature upland and wetland forest, including four vernal pools. The 72-acre Open Space lot will be owned and managed by the Greenwich Land Trust. The Land Trust will convey a Conservation Easement to the Town immediately upon the purchasing of the lot. Additional compensation includes the protection and enhancement of approximately 0.75 acres of upland and wetland habitat on the two residential lots. This is shown on the Wetland & Buffer Habitat Enhancement Plan, prepared by WKA and includes the control of invasive shrubs and vines and the establishment of native vegetation.
7.2 Potential Impacts and Mitigation

Land development has the potential to cause short- and long-term as well as direct and indirect impacts to wetlands and watercourses from activities such as vegetation clearing, soil filling, excavation or pollution of stormwater. The proposed site improvements are designed to minimize short- and long-term net adverse impacts to wetlands and watercourses.

In the long-term, the proposed project will directly alter a small portion of the W1. The proposed drive from Lot 2 will cross three narrow and sloping segments of W1. This results in a total loss of approximately 0.05 acres of wetlands which have been previously disturbed by the existing horse-riding trails through this portion of the property. Although this is a loss of wetlands, impacts have been minimized through the location of the proposed drive as it crosses the wetland in the narrowest portions. The drive crossings will be constructed with culverts approximately 30 to 50 feet long in each location through the existing wetlands. The culvert inlets and outlets will be constructed with natural gravel to capture the water flowing in and to reduce to the velocity of the water exiting the culvert to minimize the potential for erosion. By incorporating the culverts, the water from the wetland is able to continue flowing downhill and therefore the overall change to hydrology is isolated to only the portion of the wetland that will be filled. Permanent disturbance to the wetland is also minimized through the specification of retaining walls, which limit the quantity and extent of necessary fill to construct the drive. The drive crossing work will occur during low-flow conditions to protect downstream resources from turbid, sediment laden water. Water handling measures are proposed, including a temporary dewatering pit for each wetland crossing. The pits will collect sediment through dirt bags and/or crushed stone and the clean water will drain to downslope wetlands or to temporary swales.

To compensate for the permanent loss of wetlands, approximate 72-acre Open Space forest lot will be sold to the Greenwich Land Trust. The Land Trust has agreed to immediately convey a Conservation Easement to the Town of Greenwich following the transaction. The Conservation Easement will preserve the forest, which includes the majority of onsite forest wetlands. The long-term preservation of these wetlands is
substantially larger than the 0.05 acres of wetlands lost to develop the two proposed residential lots.

A *Wetland and Buffer Habitat Enhancement Plan* also is included to mitigate the wetland loss by removing and controlling invasive vegetation and establishing native vegetation on Lot 1 and 2. The portion of wetlands on Lot 1 and 2 are primarily dominated by multiflora rose. The plan proposes to revegetate approximately 450 square feet of disturbed wetland with native ferns, wildflowers and grasses. A long-term maintenance plan will control invasive species follow project completion. Additionally, approximately 0.75 acres of the adjacent upland vegetative buffer will be enhanced following the same plan, which will create a naturalized protective buffer to the downslope wetlands. Overall, this creates an improved habitat on the developed lots.

In the short-term, wetland and watercourse systems can be indirectly impacted from sediment-laden stormwater from the proposed site improvement construction activities. For this project, the area of disturbance is a total of approximately 3.4 acres. Approximately 1.08 acres of disturbance will occur within the RURA. The RURA disturbance is primarily proposed on Lot 2 to accommodate approximately 480 linear feet of drive and associated grading and drainage improvements. Disturbance within the RURA for Lot 1 is limited to grading and drainage improvements to accommodate the proposed dwelling. Due to the sloping topography and proximity to wetlands, the project proposes a construction sequencing plan which includes extensive soil erosion and sediment control measures in accordance with the 2004 CT E&S Guidelines. For both lots, soil erosion control fencing and/or haybales will be installed along the northern, southern and western limit of disturbance. A double row of fencing is proposed along the eastern limit of disturbance to prevent sediment from migrating downslope towards wetlands. Anti-tracking pads and inlet protection are also proposed to prevent sediment from leaving the site. Monitoring and maintenance of the measures will be critical to ensure their effectiveness and will be installed and maintained by the contractor and inspected by a qualified and approved site monitor. In addition to proposing control measures, the proposed construction sequencing plan minimizes the area and duration of soil disturbance at any time. While a sequencing plan is provided for Lot 1, the plan is more critical for Lot
2, as it includes disturbance within and adjacent to onsite wetlands. To minimize the potential for soil erosion or sedimentation impacts, the construction activity for Lot 2 is split into two phases. Phase 1 only includes activity required to accommodate the southern approximate 480-linear feet of drive and associated improvements. This includes the wetland crossings and the previously described protective measures. Phase 1 also encompasses the majority of the disturbance proposed within the RURA. Once the drive activity and the associated drainage improvements are complete, remaining disturbed areas will be stabilized through seeding, mulching and/or erosion mats. The final stabilization of these areas is critical to the protection of onsite and downgradient wetlands. By completing this in Phase 1, the duration and area of exposed soils is limited to only that which is required to accommodate the drive and associated improvements. The remaining lot improvements will be completed in Phase 2, including the remaining portion of the drive, parking areas, dwelling, pool, septic system and drainage improvements.

In the long-term and if not properly mitigated, wetlands and watercourses can be indirectly adversely impacted by stormwater runoff that flows from structures, pavement and ornamentally vegetated surfaces. For this project, no improvements are proposed in the Open Space, therefore the full extent of the wetland buffers and upland forest north and east of Lot 1 and 2 will remain as 72 acres of undisturbed contiguous forest. On Lot 1 and 2 an approximate 25 to 35-foot wide enhanced buffer will be established along the eastern lot boundaries (as previously discussed) to provide additional protection to onsite and downgradient wetlands.

A combined total of approximately 0.39 acres of impervious surface coverage will be added to the two residential lots: 0.10 acres on Lot 1 and 0.29 acres on Lot 2. This results in combined 4.9 percent of impervious surface between the two lots. An additional combined total of approximately 2.24 acres will be converted to landscaped areas with ornamental trees, shrubs and lawn. According to the results of studies conducted in many areas of the country, water quality is degraded and streams become impacted as the impervious cover of a watershed increases. Based on assessments of the water habitat and quality and the watershed impervious cover for numerous streams in Connecticut, and after careful consideration, the CT DEP Bureau of Water Management concluded that 12 percent
impervious cover is a good threshold for protecting streams. This conclusion was used to develop a Total Maximum Daily Load implementation plan for the Eagleville Brook in Mansfield, Connecticut that is based on impervious cover. In this plan, a TMDL target of 11 percent maximum impervious cover is used (reduced from 12 to 11 for margin of safety). Further the TMDL plan acknowledges that the effects of impervious coverage on water quality can be reduced through the use of engineered stormwater management measures. With no mitigation (ignoring the proposed stormwater management measures), the proposed project is well below the impervious coverage goal for protecting streams.

While this project is within at acceptable threshold, the project includes stormwater management plan to provide additional protection. Overall, the plan manages stormwater runoff up to and including the 100-year storm through incorporation of several low impact development BMPs including areas of permeable surfaces, infiltrations systems, rain gardens, vegetated swales, level spreaders and energy dissipater pads. The most significant low impact development measure that is proposed to manage stormwater runoff from this project is the preservation in perpetuity of 72 acres of land.

The two primary methods for stormwater management on Lot 1 are two subsurface infiltration systems proposed on the southeastern portion of the lot and two areas of permeable surfaces. The drive and pool deck will be constructed with permeable pavement and pavers which will allow stormwater falling on these surfaces to infiltrate the subgrade aggregate below where the water will be filtered and cleaned as it moves through the surrounding soils. The drive includes a surface drain to capture stormwater in a significant event and the pool deck includes a subsurface drain. Each drain will pipe water to one of the proposed infiltration systems for water storage and treatment. Additionally, the infiltration systems will retain and infiltrate stormwater runoff from the dwelling and garage. Should systems reach capacity in a significant storm event, they will overflow via subsurface piping to a level spreader locate a few feet via within western boundary of the RURA. The level spread will allow the water to be evenly distributed as it reaches the soil surface and the water will filter through approximately 100 feet of the enhanced buffer and undisturbed RURA before entering the nearest wetland area.
Several methods for stormwater management are proposed on Lot 2 including areas of permeable surfaces, subsurface infiltration systems, rains gardens and vegetated swales and gravel trenches. Similar to Lot 1, the stormwater runoff from portions of the dwelling, garage, drive, pool deck will be captured in subsurface infiltration systems proposed on the southern side of the dwelling. The pool deck and northern portion of the drive will be constructed with permeable pavement and pavers. Lot 2 also includes three rain gardens proposed on in eastern portion of the lot, downslope of the drive and pool. The rain gardens will capture overflow from the infiltration systems and subsurface pool deck drain and will also capture runoff from portions of the dwelling, parking areas and drive. The rain gardens will be planted with native vegetation and will treat water through biofiltration. The southern portion of the drive will be constructed with infiltration trenches along the eastern and western boundaries to capture stormwater runoff. Stormwater within the trenches will infiltrate into the soils below or will be directed to rain gardens for storage and treatment. As a result of these measures, long-term net adverse indirect impacts to wetlands and watercourse are avoided.

7.2.1 Wetlands Functions: Existing Conditions versus Proposed Conditions

A comparison of the ecological attributes of the existing wetland conditions and the proposed wetland conditions was completed by conducting an evaluation within the context of typical wetland functions and values as established by the Normandeau Associates Inc. in the publication *A Rapid Procedure for Assessing Wetland Functional Capacity*. Wetland functions are those self-sustaining properties of a wetland that exist in the absence of society, while wetland values are benefits that derive from either one or more functions and the physical characteristics associated with a wetland.

The comparison of the existing wetland and watercourse functions and the anticipated wetland and watercourse functions following implementation of the proposed project revealed that the wetland functions will be maintained from the existing condition. A summary of this evaluation is presented in the table below.
## Table Two: Wetland & Watercourse Functions: Existing versus Proposed Conditions

<table>
<thead>
<tr>
<th>WETLAND FUNCTIONS</th>
<th>RELATIVE CAPACITY TO PERFORM FUNCTION</th>
<th>FUNCTIONAL DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing Capacity</td>
<td>Proposed Capacity</td>
</tr>
<tr>
<td><strong>WETLAND 1 - RED MAPLE HARDWOOD SWAMP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Modification of Groundwater Discharge</td>
<td>HIGH</td>
<td>HIGH</td>
</tr>
<tr>
<td>2. Modification of Groundwater Recharge</td>
<td>MODERATE</td>
<td>MODERATE</td>
</tr>
<tr>
<td>3. Storm and Flood Water Storage</td>
<td>MODERATE</td>
<td>MODERATE</td>
</tr>
<tr>
<td>4. Modification of Water Quality</td>
<td>MODERATE - HIGH</td>
<td>MODERATE - HIGH</td>
</tr>
<tr>
<td>5. Export of Detritus</td>
<td>MODERATE</td>
<td>MODERATE</td>
</tr>
<tr>
<td>6. Contribution to Abundance and Diversity of Wetland Flora</td>
<td>MODERATE - HIGH</td>
<td>MODERATE - HIGH</td>
</tr>
<tr>
<td>7. Contribution to Abundance and Diversity of Wetland Fauna</td>
<td>MODERATE - HIGH</td>
<td>MODERATE - HIGH</td>
</tr>
</tbody>
</table>
## WETLAND 2 - ROCKY HEADWATER STREAM

<table>
<thead>
<tr>
<th>Activity</th>
<th>Levels</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Modification of Groundwater Discharge</td>
<td>HIGH</td>
<td>Unchanged - The capacity of the wetland to influence the amount of water moving from ground water to surface water is not expected to be altered.</td>
</tr>
<tr>
<td>2. Modification of Groundwater Recharge</td>
<td>LOW</td>
<td>Unchanged - The capacity of the wetland to influence the amount of water moving from surface water to ground water is not expected to be altered.</td>
</tr>
<tr>
<td>3. Storm and Flood Water Storage</td>
<td>LOW - MODERATE</td>
<td>Unchanged - The capacity of the wetland to store floodwater is not expected to be altered.</td>
</tr>
<tr>
<td>4. Modification of Water Quality</td>
<td>MODERATE - HIGH</td>
<td>Unchanged - The capacity of the wetland to modify water quality is not expected to be altered.</td>
</tr>
<tr>
<td>5. Export of Detritus</td>
<td>HIGH</td>
<td>Unchanged - The capacity of the wetland to export organic detritus from the wetland to the adjacent and downstream aquatic ecosystems is not expected to be altered.</td>
</tr>
<tr>
<td>6. Contribution to Abundance and Diversity of Wetland Flora</td>
<td>MODERATE - HIGH</td>
<td>Unchanged - The wetland’s capacity to contribute to the abundance and diversity of wetland flora is not expected to be altered.</td>
</tr>
<tr>
<td>7. Contribution to Abundance and Diversity of Wetland Fauna</td>
<td>MODERATE - HIGH</td>
<td>Unchanged - The wetland’s capacity to contribute to the abundance and diversity of wetland fauna is not expected to be altered.</td>
</tr>
</tbody>
</table>

## WETLAND 3 - VERNAL POOLS

<table>
<thead>
<tr>
<th>Activity</th>
<th>Levels</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Modification of Groundwater Discharge</td>
<td>LOW - MODERATE</td>
<td>Unchanged - The capacity of the wetland to influence the amount of water moving from ground water to surface water is not expected to be altered.</td>
</tr>
<tr>
<td>2. Modification of Groundwater Recharge</td>
<td>HIGH</td>
<td>Unchanged - The capacity of the wetland to influence the amount of water moving from surface water to ground water is not expected to be altered.</td>
</tr>
<tr>
<td>3. Storm and Flood Water Storage</td>
<td>HIGH</td>
<td>Unchanged - The capacity of the wetland to store floodwater is not expected to be altered.</td>
</tr>
</tbody>
</table>
### Proposed Activities & Potential Impacts and Mitigation

<table>
<thead>
<tr>
<th>Activity</th>
<th>Impact Rating</th>
<th>Impact Rating</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Modification of Water Quality</td>
<td>HIGH</td>
<td>HIGH</td>
<td>Unchanged - The capacity of the wetland to modify water quality is not expected to be altered.</td>
</tr>
<tr>
<td>5. Export of Detritus</td>
<td>LOW</td>
<td>LOW</td>
<td>Unchanged - The capacity of the wetland to export organic detritus from the wetland to the adjacent and downstream aquatic ecosystems is not expected to be altered.</td>
</tr>
<tr>
<td>6. Contribution to Abundance and Diversity of Wetland Flora</td>
<td>HIGH</td>
<td>HIGH</td>
<td>Unchanged - The wetland’s capacity to contribute to the abundance and diversity of wetland flora is not expected to be altered.</td>
</tr>
<tr>
<td>7. Contribution to Abundance and Diversity of Wetland Fauna</td>
<td>HIGH</td>
<td>HIGH</td>
<td>Unchanged - The wetland’s capacity to contribute to the abundance and diversity of wetland fauna is not expected to be altered.</td>
</tr>
</tbody>
</table>

**Wetland 4 - Ditch/Artificial Intermittent Stream**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Impact Rating</th>
<th>Impact Rating</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Modification of Groundwater Discharge</td>
<td>MODERATE</td>
<td>MODERATE</td>
<td>Unchanged - The capacity of the wetland to influence the amount of water moving from ground water to surface water is not expected to be altered.</td>
</tr>
<tr>
<td>2. Modification of Groundwater Recharge</td>
<td>LOW</td>
<td>LOW</td>
<td>Unchanged - The capacity of the wetland to influence the amount of water moving from surface water to ground water is not expected to be altered.</td>
</tr>
<tr>
<td>3. Storm and Flood Water Storage</td>
<td>LOW</td>
<td>LOW</td>
<td>Unchanged - The capacity of the wetland to store floodwater is not expected to be altered.</td>
</tr>
<tr>
<td>4. Modification of Water Quality</td>
<td>LOW</td>
<td>LOW</td>
<td>Unchanged - The capacity of the wetland to modify water quality is not expected to be altered.</td>
</tr>
<tr>
<td>5. Export of Detritus</td>
<td>HIGH</td>
<td>HIGH</td>
<td>Unchanged - The capacity of the wetland to export organic detritus from the wetland to the adjacent and downstream aquatic ecosystems is not expected to be altered.</td>
</tr>
<tr>
<td>6. Contribution to Abundance and Diversity of Wetland Flora</td>
<td>LOW - MODERATE</td>
<td>LOW - MODERATE</td>
<td>Unchanged - The wetland’s capacity to contribute to the abundance and diversity of wetland flora is not expected to be altered.</td>
</tr>
<tr>
<td>7. Contribution to Abundance and Diversity of Wetland Fauna</td>
<td>LOW - MODERATE</td>
<td>LOW - MODERATE</td>
<td>Unchanged - The wetland’s capacity to contribute to the abundance and diversity of wetland fauna is not expected to be altered.</td>
</tr>
</tbody>
</table>
7.2.2 Vernal Pool Assessment: Existing Conditions versus Proposed Conditions

The percentage of undeveloped land surrounding vernal pools is a key metric in determining vernal pool productivity (Calhoun and Klemens, 2002). Two buffers surrounding each pool are calculated: the Vernal Pool Envelope (VPE, 100 feet from the periphery of the pool) and the Critical Terrestrial Habitat (CTH, the area between 100 feet and 750 feet from the periphery of the pool). Best management practices indicate to protect the productivity of a vernal pool, the VPE requires 75 percent undeveloped land within the buffer and the CTH requires 50 percent undeveloped land within the buffer. Figure 5 maps the vernal pool buffers and the proposed development. With the proposed subdivision, the VPE for all four vernal pools will remain undeveloped and the CTH will remain undeveloped for Vernal Pool 2, 3 and 4 (the CTH of Vernal Pool 2 will decrease by less than 0.1 percent). The CTH of Vernal Pool 1 will decrease from 97 percent to 91 percent. This is well above the 50 percent threshold and, due to the proposed Open Space, there is little opportunity for the percentage undeveloped land within the buffer to decrease in the future.

7.2.3 Endangered and Threatened Species: Protection

As previously discussed, the property is a habitat for three protected bat species: the northern long-eared bat, the tri-colored bat and the little brown bat. All three are listed as state endangered species and the northern long-eared bat is a federally threatened species. The NDDB determination letter provided a tree cutting restriction area. Tree cutting should not be conducted within this area without consultation from the USFWS. Figure 6 depicts the location of restriction area at the property. Lot 1 and 2, the two residential lots, are located outside the restricted area of tree cutting. The letter also details additional steps to protect the bats during construction activity, such as conducting tree clearing during hibernation periods, retaining large diameter trees and retaining dead and dying trees. The proposed project achieves tree perseverance via the preservation of 72 acres of Open Space forest.
ECOLOGICAL ASSESSMENT REPORT

FIGURE 6: NORTHERN LONG-EARED BAT HABITAT PROTECTION ZONE MAP

OWNER: AQUARIUM WATER COMPANY OF CONNECTICUT
LOCATION: LAKE AVENUE GREENWICH, CONNECTICUT

NOTES:
The limit of the Northern Long-Eared Bat Habitat Protection Zone is taken from a map provided by CT DEEP regarding NEBB Determination No. 2019-1527. Northern Long-Eared Bats are federally listed as threatened and state endangered.
8.0 ALTERNATES

Alternate development plans were considered by the Applicant. These alternate plans are subdivisions with eleven, four and three residential lots each. The alternate plans are described below.

Alternate 1

This plan includes 11 residential lots and proposes disturbance to and development on the majority of the upland areas onsite, including additional work adjacent to and within the RURA along steep slopes. Eight lots are proposed on the western portion of the property and three lots are proposed on the east portion of the property. While the development would not increase direct impacts to wetlands, it would expand the residential lots to approximately 50.2 acres (or 51.4 percent of the total property) and reduce the proposed Open Space to approximately 47.4 acres. This plan would require tree clearing in the bat protection area.

Alternate 2

This plan includes four residential lots and proposes disturbance to and development on approximately 16 acres (or 19.9 percent) of the property. Three lots are proposed on the eastern portion of the property and one lot is proposed on the western portion of the property. Each lot would be larger than those proposed in the current proposal and the Open Space would be approximately 64.3 acres. This plan would also require tree clearing in the bat protection area.

Alternate 3

This plan includes three residential lots and proposes disturbance to and development on approximately 19.8 percent of the property. Two lots are proposed on the eastern portion of the property and one lot is proposed on the western portion of the property. These proposed lots are larger than Alternate 2 and the total area of development is only slightly reduced (by less than 0.1 acres). The Open Space would be approximately 64.4 acres. This plan would also require tree clearing in the bat protection area.
The proposed project minimizes the area of developed land (a total of approximately 8 acres) and the area of protected land (the Open Space, approximately 72 acres). These measures provide protection to the overall health and value of the onsite wetlands, watercourses and vernal pools. Potential impacts to endangered and threatened bats are also minimized as no tree clearing is proposed within the bat protection radius. As such, we find the current proposal to be the most feasible and prudent alternative.

9.0 CONCLUSIONS

On behalf of the Aquarion Water Company of Connecticut, WKA conducted an ecological assessment on a portion of an approximate 98-acre property in Greenwich, Connecticut. The investigation included the identification, delineation and assessment of regulated wetlands and watercourses, the assessment of vernal pools and the mapping of vegetation, wildlife communities and soil types on approximately 80.3 acres. The project proposes permanent protection of significant inland wetlands and watercourses and adjacent upland areas with only minor wetland disturbance. Approximately 72 acres of forested wetlands, watercourses and upland areas will be protected in perpetuity and approximately 0.75 acres of upland and wetland habitat will be enhanced on the proposed residential lots. In addition, best management practices will be employed during and following construction to prevent indirect impacts to wetlands and watercourses from the two proposed residential properties. The residential lots will not adversely impact the critical terrestrial habitat for onsite vernal pools and required tree clearing will be outside the tree protection radius for endangered and threatened bat species. As such, we find that the proposed project provides significant long-term ecological benefits to compensate for the relatively minor impacts to onsite wetlands.
10.0 REFERENCES


Water Quality Classifications Map of Connecticut, South Central Coast, compiled by Bureau of Water Management, Planning and Standards Division, Connecticut Department of Environmental Protection, dated 1993.
APPENDIX A:

RESUME OF INVESTIGATORS AND AUTHORS
Mr. William L. Kenny has more than 30 years of experience in site and environmental assessments, planning and construction. Mr. Kenny is a Registered Landscape Architect, Certified Professional Wetland Scientist, and a Soil Scientist.

**Education**


University of Connecticut, BS, 1987. Bachelor of Science Degree in Landscape Design.

**Representative Work Experience**

**Site Planning and Landscape Architecture**

Mr. Kenny has more than 30 years of experience with site planning and landscape architectural projects either as the primary designer and project manager, a collaborating design professional, or construction contractor. Mr. Kenny has design and management experience with all project phases: from master planning and conceptual design to construction and bid document preparation and construction observation.

**Wetland Delineation, Assessment, and Impact Mitigation**

Mr. Kenny has extensive experience with tidal and inland wetland and watercourse delineation, assessment, and impact mitigation projects and obtaining related regulatory approvals as a project scientist and manager. Project work has included approval and construction documents for residential, commercial, recreational, and institutional developments. Specific tasks Mr. Kenny has completed include: (1) wetland delineations and functional assessments in Connecticut and New York in accordance with federal, state, and local requirements; (2) development planning and design consultation to minimize wetland impacts; (3) impact assessments and wetland construction mitigation designs; and (4) hydrologic evaluations for inland and tidal wetland restoration and creation projects.

**Water Resource Management**

Mr. Kenny has a wide range of experience with water resource management projects and attaining related development approvals and permits as a project manager and scientist. Project work has included stormwater pollution prevention plan preparation in accordance with New York City, New York State, and Connecticut requirements; stormwater treatment Best Management Practices design; stormwater pollutant loading and BMP effectiveness modeling; groundwater modeling for subsurface sanitary disposal
systems, and erosion and sediment control plan preparation for residential, commercial, recreational, and institutional developments.

**Ecological Inventories and Impact Assessments**

Mr. Kenny has broad experience with preparing ecological inventories and impact assessments and attaining related development approvals and permits as a project manager and scientist. Project work included Environmental Impact Statement (EIS) preparation to fulfill New York State requirements. Specific management or technical responsibilities included mapping and assessing existing conditions and potential impacts to bedrock and surficial geology, soils, vegetative communities, wetlands, surface and groundwater bodies, and wildlife and their habitat.

**Regulatory Agency Consulting**

Mr. Kenny has been retained by Connecticut municipalities to conduct analyses and prepare reports regarding inland wetlands and watercourses permit applications to be heard by local agencies. This work includes the review of wetland boundary delineations.

**Public Speaking**

- CT Audubon – Recurring annual lecture since 2015 regarding native plants and communities.
- Yale University – Lecturer regarding sustainable and ecological landscape design.
- UConn – Advanced Master Gardener Program – Lecturer regarding innovative strategies for wetland restoration and management.
- CT ASLA – Lecturer regarding innovative strategies for wetland restoration and management.
- Connecticut Association of Conservation & Inland Wetlands Commissions - Lecturer regarding innovative strategies for wetland restoration and management.
- New York Botanical Garden – Lecturer regarding innovative strategies for wetland restoration and management.

**Professional Training**

- OSHA 24-hour HAZWOPER Training
- Organic Land Care
- CT DEP Master Wildlife Conservationist Program
- Pond Management
- Wetland Construction
- Wetland Functional Assessment Techniques
- Urban Stormwater Management Practices
- Erosion and Sediment Control
- Soil Sciences
- Computer Aided Drafting
Publications


Contributing graduate student author to:

Professional Affiliations and Registrations

Flood & Erosion Control Board, Fairfield, Connecticut (Member 2011- 2015)
Connecticut Association of Wetland Scientist (Member 1999-present, Secretary 2001 - 2010)
Society of Soil Scientist of Southern New England (Associate Member 1995-2004, Professional Member 2004 -present)
Society of Wetland Scientists (Member 2001-present)
Certified Professional Wetland Scientist (#1372), Society of Wetland Scientists (2003-present)
Professional registration, Landscape Architecture
    #664, State of Connecticut (1990-present)
    #001869, State of New York (2003-present)
American Society of Landscape Architects (Member 2001-2010, 2013-present)
Ecological Society of America (Member 2020-present)
Northeast Organic Farming Association (2004-present)
Certified Organic Land Care Professional (2005-present)
OSHA Certified (24-hour HAZWOPER Training)
Mr. Timothy F. Veit has experience providing numerous environmental services, including assessing the quality and functionality of various coastal and inland ecosystems, evaluating the potential biological and environmental impacts of proposed projects, delineating wetland and watercourse boundaries and monitoring erosion and sediment control measures during project construction. Prior to this position, Mr. Veit attended Vassar College, where he worked as a biology student research fellow, studying emerald ash borer prevention methods, research that was presented at the Northeast Natural History Conference at the Eagle Hill Institute. Moreover, he participated in ecological restoration projects that focused on the removal and prevention of invasive vines and *Phragmites australis*.

**Education**

Vassar College, Poughkeepsie, NY, 2012-2016. Bachelor of Arts in Biology with a minor in Religion.

**Representative Project Experience**

**Wetland Delineation, Assessment and Impact Mitigation**

Mr. Veit has experience with inland and tidal wetland and watercourse delineations as well as assessing the impacts of proposed projects on the surrounding ecosystem as a project ecologist. Project work includes assisting with attaining approval and construction documents for residential, commercial, recreational and institutional developments. Specific tasks Mr. Veit has completed include: (1) wetland delineations and functional assessments in Connecticut and New York in accordance with federal, state and local standards; (2) impact assessments and for projects in coastal and inland areas.

**Ecological Inventories and Assessments**

Mr. Veit has experience with preparing ecological inventories and impact assessments for properties in coastal and inland areas for the purpose of assisting with attaining development approvals and permits as a project ecologist. Specific management or technical responsibilities included mapping and assessing existing conditions and potential impacts to soils, vegetative communities, wetlands, surface and groundwater bodies, wildlife and their associated habitats.

**Erosion And Sediment Control**

Mr. Veit has experience with erosion and sediment control protocols which include numerous visits at a variety of project sites to ensure compliance with state and town guidelines. This includes reviewing proposed erosion and sediment control measures and routine inspection of their functional status during construction.
Publications

Principal Author


Contributing Author


Ms. Carolyn Matthews has experience providing numerous environmental services, including assessing the quality and functionality of various coastal and inland ecosystems, evaluating the potential biological and environmental impacts of proposed projects, delineating wetland and watercourse boundaries and monitoring erosion and sediment control measures during project construction. Prior to joining WKA, Carolyn spent six years managing an Urban Forestry & Natural Resource Consulting office based in New York City. As Area Manager she was responsible for overseeing a range of environmental conservation projects in the NYC metro area including invasive species eradication programs, urban forestry management planning, tree inventories and risk assessments, pollinator garden installations and ecological restoration projects by working closely with local cemeteries, parks, universities, municipalities, construction and engineering firms, and state and federal agencies.

Education


Representative Work Experience

Wetland Delineation, Assessment and Impact Mitigation
Ms. Matthews has experience with inland and tidal wetland and watercourse delineations as well as assessing the impacts of proposed projects on the surrounding ecosystem as a project ecologist. Project work includes assisting with attaining approval and construction documents for residential, commercial, recreational and institutional developments. Specific tasks Ms. Matthews has completed include: (1) wetland delineations and functional assessments in Connecticut and New York in accordance with federal, state and local standards; (2) impact assessments for projects in coastal and inland wetlands.

Ecological Inventories and Assessments
Ms. Matthews has experience with preparing ecological inventories and impact assessments for properties in coastal and inland areas for the purpose of assisting with attaining development approvals and permits as a project ecologist. Specific management or technical responsibilities included mapping and assessing existing conditions and potential impacts to soils, vegetative communities, wetlands, surface and groundwater bodies, wildlife and their associated habitats.
Erosion and Sediment Control
Ms. Matthews has experience with erosion and sediment control protocols which include numerous visits at a variety of project sites to ensure compliance with state and town guidelines. This includes reviewing proposed erosion and sediment control measures and routine inspection of their functional status during construction.

Tree Inventories and Assessments
Ms. Matthews has experience with various urban forestry projects including Tree Inventories, Tree Risk Assessments, Storm Damage Response and developing Priority Tree Maintenance Plans as a project arborist. Specific tasks and management responsibilities include mapping through GIS software, identifying defects, pests and disease, prescribing maintenance, evaluating risk of failure and overall tree condition, quantifying environmental benefits, creating tree protection plans on construction sites and working with organizations to develop tree community sustainability initiatives.

Professional Certifications and Training

Certified Arborist, International Society of Arboriculture No. NE-6822A (2011)
Tree Risk Assessment Qualification, International Society of Arboriculture (2014)
Davey Institute of Tree Sciences Graduate (2016)
Certified Ecologist, Ecological Society of America (2020)

Professional Affiliations

Connecticut Association of Wetland Scientists
Connecticut Botanical Society
Ecological Landscape Alliance
Ecological Society of America
International Society of Arboriculture
New York State Arborists
New York State Urban Forestry Council

Publications

APPENDIX B:

LIST OF VEGETATION AND WILDLIFE
VEGETATION INVENTORY

<table>
<thead>
<tr>
<th>SCIENTIFIC NAME</th>
<th>COMMON NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trees</strong></td>
<td></td>
</tr>
<tr>
<td>Acer rubrum</td>
<td>Red maple</td>
</tr>
<tr>
<td>Acer platanoides</td>
<td>Norway maple</td>
</tr>
<tr>
<td>Acer saccharum</td>
<td>Sugar maple</td>
</tr>
<tr>
<td>Aralia elata</td>
<td>Japanese angelica tree</td>
</tr>
<tr>
<td>Betula alleghaniensis</td>
<td>Yellow birch</td>
</tr>
<tr>
<td>Betula lenta</td>
<td>Black birch</td>
</tr>
<tr>
<td>Carpinus caroliniana</td>
<td>American hornbeam</td>
</tr>
<tr>
<td>Carya glabra</td>
<td>Pignut hickory</td>
</tr>
<tr>
<td>Carya ovata</td>
<td>Shaqbark hickory</td>
</tr>
<tr>
<td>Fagus grandifolia</td>
<td>American beech</td>
</tr>
<tr>
<td>Fraxinus americana</td>
<td>White ash</td>
</tr>
<tr>
<td>Hamamelis virginiana</td>
<td>Witch hazel</td>
</tr>
<tr>
<td>Ilex opaca</td>
<td>American holly</td>
</tr>
<tr>
<td>Liriodendron tulipifera</td>
<td>Tuliptree</td>
</tr>
<tr>
<td>Juniperus virginiana</td>
<td>Eastern red cedar</td>
</tr>
<tr>
<td>Nyssa sylvatica</td>
<td>Black gum</td>
</tr>
<tr>
<td>Pinus strobus</td>
<td>Eastern white pine</td>
</tr>
<tr>
<td>Prunus serotina</td>
<td>Black cherry</td>
</tr>
<tr>
<td>Quercus alba</td>
<td>White oak</td>
</tr>
<tr>
<td>Ostrya Virginiana</td>
<td>American hophornbeam</td>
</tr>
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<td>Quercus bicolor</td>
<td>Swamp white oak</td>
</tr>
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<td>Chestnut oak</td>
</tr>
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<td>Quercus palustris</td>
<td>Pin oak</td>
</tr>
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<td>Red oak</td>
</tr>
<tr>
<td>Quercus velutina</td>
<td>Black oak</td>
</tr>
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<td>Sassafras albidum</td>
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<td>Tsuga canadensis</td>
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</tr>
<tr>
<td>Ulmus americanum</td>
<td>American elm</td>
</tr>
<tr>
<td><strong>Shrubs and Vines</strong></td>
<td></td>
</tr>
<tr>
<td>Ampelopsis brevipedunculata</td>
<td>Porcelainberry</td>
</tr>
<tr>
<td>Berberis thunbergii</td>
<td>Japanese barberry</td>
</tr>
<tr>
<td>Celastrus orbiculatus</td>
<td>Oriental bittersweet</td>
</tr>
<tr>
<td>Cornus amomum</td>
<td>Silky dogwood</td>
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<tr>
<td>Euonymus alatus</td>
<td>Winged euonymus</td>
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<tr>
<td>Ilex verticillata</td>
<td>Winterberry</td>
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<tr>
<td>Ligustrum vulgare</td>
<td>Common privet</td>
</tr>
<tr>
<td>Lindera benzoin</td>
<td>Spicebush</td>
</tr>
<tr>
<td>Lonicera japonica</td>
<td>Japanese honeysuckle</td>
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<tr>
<td>Lonicera tatarica</td>
<td>Tatarian honeysuckle</td>
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<tr>
<td>Parthenocissus quinquefolia</td>
<td>Virginia creeper</td>
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<tr>
<td>Herbaceous Species *</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
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</tr>
<tr>
<td>Alliaria petiolata</td>
<td>Garlic mustard</td>
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<tr>
<td>Allium spp.</td>
<td>Wild onion</td>
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<tr>
<td>Ambrosia artemisiifolia</td>
<td>Common ragweed</td>
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<tr>
<td>Artemisia trifida</td>
<td>Giant ragweed</td>
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<tr>
<td>Artemisia vulgaris</td>
<td>Common mugwort</td>
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<tr>
<td>Aster divaricatus</td>
<td>White wood aster</td>
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<tr>
<td>Athyrium felix-femina</td>
<td>Lady fern</td>
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<tr>
<td>Boehmeria cylindrica</td>
<td>False nettle</td>
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<tr>
<td>Carex blanda</td>
<td>Eastern woodland sedge</td>
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<tr>
<td>Carex stricta</td>
<td>Tussock sedge</td>
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<tr>
<td>Dennstaedtia punctiloba</td>
<td>Hay-scented fern</td>
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<tr>
<td>Erythronium americanum</td>
<td>Trout Lilly</td>
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<tr>
<td>Fallopia japonica</td>
<td>Japanese knotweed</td>
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<tr>
<td>Fragaria virginiana</td>
<td>Wild strawberry</td>
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<tr>
<td>Impatiens capensis</td>
<td>Common jewelweed</td>
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<tr>
<td>Juncus effusus</td>
<td>Soft rush</td>
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<tr>
<td>Juncus tenuis</td>
<td>Path rush</td>
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<tr>
<td>Maianthemum canadense</td>
<td>Canada mayflower</td>
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<tr>
<td>Mitchella repens</td>
<td>Partridge berry</td>
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<tr>
<td>Onoclea sensibilis</td>
<td>Sensitive fern</td>
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<td>Osmundastrum cinnamomeum</td>
<td>Cinnamon fern</td>
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<tr>
<td>Osmunda regalis</td>
<td>Royal fern</td>
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<tr>
<td>Panicum clandestinum</td>
<td>Deer-tongue grass</td>
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<tr>
<td>Pachysandra terminalis</td>
<td>Japanese pachysandra</td>
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<tr>
<td>Phalaris arundinacea</td>
<td>Reed canary grass</td>
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<tr>
<td>Poa pratensis</td>
<td>Kentucky blue-grass</td>
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<tr>
<td>Polystichum acrostichoides</td>
<td>Christmas fern</td>
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<tr>
<td>Symlocarpus foetidus</td>
<td>Skunk cabbage</td>
</tr>
<tr>
<td>Thelypteris noveboracensis</td>
<td>New York fern</td>
</tr>
<tr>
<td>Urtica dioica</td>
<td>Stinging nettle</td>
</tr>
<tr>
<td>Veratrum viride</td>
<td>Green false hellebore</td>
</tr>
</tbody>
</table>

*Herbaceous list not comprehensive based on seasonal constraints of field work.*
## WILDLIFE SPECIES LIST

**OBSERVED, POTENTIALLY OCCURRING IN, OR UTILIZING VEGETATION & WILDLIFE COMMUNITIES**

<table>
<thead>
<tr>
<th>SCIENTIFIC NAME</th>
<th>COMMON NAME</th>
</tr>
</thead>
</table>

### Amphibians

- *Ambystoma opacum*  
  Marbled salamander
- *Ambystoma laterale*  
  Blue-spotted salamander
- *Anaxyrus americanus americanus*  
  Eastern American toad
- *Plethodon cinereus*  
  Redback salamander
- *Pseudacris crucifer*  
  Northern spring peeper
- *Rana catesbeiana*  
  Bull frog
- *Rana clamitans*  
  Green frog
- *Rana sylvatica*  
  Wood frog

### Reptiles

- *Chelydra s. serpentine*  
  Common snapping turtle
- *Clemmys guttata*  
  Spotted turtle
- *Glyptemys insculpta*  
  Wood turtle
- *Sternotherus odoratus*  
  Common musk turtle
- *Storeria dekayi*  
  Northern brown snake
- *Terrapene Carolina carolina*  
  Eastern box turtle
- *Thamnophis s. sirtalis*  
  Eastern garter snake

### Birds

- *Accipiter striatus*  
  Sharp-shinned hawk
- *Agelaius phoeniceus*  
  Red-winged blackbird
- *Anas platyrhynchos*  
  Mallard
- *Asio otus*  
  Long-eared owl
- *Aythya collaris*  
  Ring-necked duck
- *Bacolophus bicolor**  
  Tufted titmouse
- *Bombycillidae cedrorum*  
  Cedar waxwing
- *Bonasa umbellus*  
  Ruffed grouse
- *Branta canadensis**  
  Canada goose
- *Buteo jamaicensis*  
  Red-tailed hawk
- *Buteo lineatus*  
  Red-shouldered hawk
- *Cardinalis cardinalis*  
  Northern cardinal
- *Carduelis tristis*  
  American goldfinch
- *Carpodacus mexicanus*  
  House finch
- *Cathartes aura*  
  Turkey vulture
- *Catharus fuscescens*  
  Veery
- *Chaetura pelagica**  
  Chimney swift
- *Charadrius vociferous*  
  Killdeer
- *Colaptes auratus*  
  Northern flicker
- *Colinus virginianus*  
  Bobwhite quail
- *Columba livia*  
  Rock dove
<table>
<thead>
<tr>
<th>Bird Species</th>
<th>Common Name</th>
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<tbody>
<tr>
<td>Contopus virens</td>
<td>Eastern wood pewee</td>
</tr>
<tr>
<td>Coragyps atratus</td>
<td>Black vulture</td>
</tr>
<tr>
<td>Corvus brachyrhynchos*</td>
<td>American crow</td>
</tr>
<tr>
<td>Cyanocitta cristata*</td>
<td>Blue jay</td>
</tr>
<tr>
<td>Dryocopus pileatus</td>
<td>Pileated woodpecker</td>
</tr>
<tr>
<td>Dumetella carolinensis</td>
<td>Gray catbird</td>
</tr>
<tr>
<td>Euphagus carolinus</td>
<td>Rusty blackbird</td>
</tr>
<tr>
<td>Hirundo rustica</td>
<td>Barn swallow</td>
</tr>
<tr>
<td>Junco hyemalis</td>
<td>Dark-eyed junco</td>
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<tr>
<td>Larus delawarensis</td>
<td>Ring-billed gull</td>
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<tr>
<td>Melanerpes carolinus**</td>
<td>Red-bellied woodpecker</td>
</tr>
<tr>
<td>Melanerpes erythrocephalus</td>
<td>Red-headed woodpecker</td>
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<tr>
<td>Meleagris gallopavo*</td>
<td>Eastern wild turkey</td>
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<tr>
<td>Mniotilta varia</td>
<td>Black-and-white warbler</td>
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<tr>
<td>Parus atricapillus</td>
<td>Black-capped chickadee</td>
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<tr>
<td>Passer domesticus**</td>
<td>House sparrow</td>
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<tr>
<td>Picoides pubescens**</td>
<td>Downy woodpecker</td>
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<tr>
<td>Picoides pubescens</td>
<td>Hairy woodpecker</td>
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<tr>
<td>Quiscalus quiscale**</td>
<td>Common grackle</td>
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<tr>
<td>Sayornis phoebe**</td>
<td>Eastern phoebe</td>
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<tr>
<td>Scolopax minor**</td>
<td>American woodcock</td>
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<tr>
<td>Seiurus aurocapilla**</td>
<td>Ovenbird</td>
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<tr>
<td>Setophaga coronate**</td>
<td>Yellow-rumped warbler</td>
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<tr>
<td>Setophaga pinus**</td>
<td>Pine warbler</td>
</tr>
<tr>
<td>Setophaga ruticilla**</td>
<td>American redstart</td>
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<tr>
<td>Sialia sialis*</td>
<td>Eastern bluebird</td>
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<tr>
<td>Sitta carolinensis</td>
<td>White-breasted nuthatch</td>
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<tr>
<td>Sphyrapicus varius**</td>
<td>Yellow-bellied sapsucker</td>
</tr>
<tr>
<td>Spinus tristis**</td>
<td>American goldfinch</td>
</tr>
<tr>
<td>Spizella arborea*</td>
<td>American tree sparrow</td>
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<tr>
<td>Spizalla passerina</td>
<td>Chipping sparrow</td>
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<tr>
<td>Stelgidopteryx serripennis</td>
<td>Northern Rough-winged swallow</td>
</tr>
<tr>
<td>Strix varia</td>
<td>Barred owl</td>
</tr>
<tr>
<td>Sturnus vulgaris</td>
<td>European starling</td>
</tr>
<tr>
<td>Tachycineta bicolor</td>
<td>Tree Swallow</td>
</tr>
<tr>
<td>Thryothorus ludovicianus**</td>
<td>Carolina wren</td>
</tr>
<tr>
<td>Troglodytes hielmis</td>
<td>Winter wren</td>
</tr>
<tr>
<td>Turdus migratorius*</td>
<td>American robin</td>
</tr>
<tr>
<td>Tyto alba</td>
<td>Barn owl</td>
</tr>
<tr>
<td>Vireo olivaceus**</td>
<td>Red-eyed vireo</td>
</tr>
<tr>
<td>Zenaida macroura</td>
<td>Mourning dove</td>
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</table>

**Mammals**

<table>
<thead>
<tr>
<th>Species</th>
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<tbody>
<tr>
<td>Canis lutrans</td>
<td>Coyote</td>
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<tr>
<td>Didelphus virginiana</td>
<td>Virginia opossum</td>
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<tr>
<td>Glaucomys volans</td>
<td>Southern flying squirrel</td>
</tr>
<tr>
<td>Lynx rufus</td>
<td>Bobcat</td>
</tr>
<tr>
<td>Marmot monax</td>
<td>Woodchuck</td>
</tr>
<tr>
<td>Mephitis mephitis</td>
<td>Striped skunk</td>
</tr>
<tr>
<td>Microtus pennsylvanicus</td>
<td>Meadow vole</td>
</tr>
<tr>
<td>Species</td>
<td>Common Name</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Myotis septentrionalis</td>
<td>Northern long-eared bat</td>
</tr>
<tr>
<td>Myotis sodalis</td>
<td>Indiana bat</td>
</tr>
<tr>
<td>Odocoileus virginianus*</td>
<td>White-tailed deer</td>
</tr>
<tr>
<td>Perimyotis subflavus</td>
<td>Tricolored bat</td>
</tr>
<tr>
<td>Peromyscus leucopus*</td>
<td>White-Footed mouse</td>
</tr>
<tr>
<td>Procyon lotor</td>
<td>Raccoon</td>
</tr>
<tr>
<td>Sciurus carolinensis*</td>
<td>Gray squirrel</td>
</tr>
<tr>
<td>Sylvilagus floridanus*</td>
<td>Eastern cottontail</td>
</tr>
<tr>
<td>Tamias striata*</td>
<td>Eastern chipmunk</td>
</tr>
<tr>
<td>Tamiasciurus hudsonicus</td>
<td>Red squirrel</td>
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<tr>
<td>Urocyon cinereoargenteus</td>
<td>Gray fox</td>
</tr>
<tr>
<td>Vulpes vulpes</td>
<td>Red fox</td>
</tr>
</tbody>
</table>

* Indicates species observed either directly or by sign
** Indicates species observed near the site (<1 mile) during the winter season by local birdwatchers
(Cornell Lab of Ornithology & the National Audubon Society)
APPENDIX C:

NATURAL DIVERSITY DATABASE DETERMINATION LETTER
Dear Mr. Kenny,

I have reviewed Natural Diversity Database (NDDB) maps and files regarding the area delineated on maps provided for Residential development, 836 Lake Avenue, Greenwich, Connecticut. According to our information we have records for Federally Threatened and State Endangered *Myotis septentrionalis* (Northern long-eared bat), and State Endangered *Perimyotis subflavus* (Tri-colored bat) and *Myotis lucifugus* (Little brown bat).

**Northern long-eared bat:**
The Northern long-eared bat is one of the species most impacted by White Nose Syndrome. Populations in Connecticut have declined by over 90%, and it has been Federally listed as Threatened as of May 4, 2015. During the summer northern long-eared bats roost singly or in maternal colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees). Males and non-reproductive females may also roost in cooler places, like caves and mines. Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. This bat has also been found rarely roosting in structures, like barns and sheds. Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula.

The US Fish and Wildlife Service has defined purposeful and incidental take of Federally Threatened Northern long-eared bat under a 4(d) ruling of the Federal Endangered Species Act ([https://www.fws.gov/midwest/endangered/mammals/nleb/FAQsFinal4dRuleNLEB.html](https://www.fws.gov/midwest/endangered/mammals/nleb/FAQsFinal4dRuleNLEB.html)). The 4(d) rule prohibits incidental take that may occur from tree removal activities within 0.25 miles of a hibernation site, year round. This would apply to the northern portion of your project area (see attached map).

**Tri-colored bat:**
The tricolored bat (formerly known as the eastern pipistrelle) was historically, one of the most common species of bats found throughout the eastern forests of America. But, surprisingly little is known about its daytime summer or maternity roosts. These bats are among the first bats to emerge at dusk each night, and their appearance at tree-top level indicates that they may roost in foliage or in high tree cavities and crevices. They are not often found in buildings or in deep woods, seeming to prefer edge habitats near areas of mixed agricultural use. Where information about their foraging is known, these bats have been found to feed on large hatches of grain moths emerging from corn cribs, indicating that they may be of important agricultural benefit. Tricolored bat cannot withstand freezing temperatures and are among the first bats to enter hibernation each fall and among the last to emerge in spring. Hibernation sites are found deep within caves or mines in areas of relatively warm, stable temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year.
**Little brown bat:**
Little brown bat populations, once one of the most common bat species in Connecticut, have declined over 90% as a result of White Nose Syndrome. During summer, they will roost in buildings, trees, under rocks, and in piles of wood. Foraging is focused at edges of forested habitat along bodies of water. Maternity roosts occur in trees or buildings with a southwesterly exposure. During the winter season, Little brown bats will seek refuge in “hibernation roosts,” typically caves, rock fissures, or abandoned mines.

**Conservation Recommendations for Bats:**
- Tree cutting and other land-clearing activities should not be conducted in the area depicted on the attached map prior to consulting with the US Fish and Wildlife Service Ecological Field Office to ensure compliance with the Federal Endangered Species Act. For more information on federal requirements visit: [http://www.fws.gov/midwest/endangered/mammals/nleb/](http://www.fws.gov/midwest/endangered/mammals/nleb/)
- Tree cutting and other land-clearing activities on the remaining portion of the project site should be conducted during the hibernation period of these animals. Tree cutting should be conducted from November 1 through March 30 to ensure that bats are situated in their hibernacula.
- Long-term impacts can be minimized by retaining large diameter coniferous and deciduous trees whenever possible. Establishing this sort of wooded buffer adjacent to the wetland area, will help maintain potential roosting habitat.
- Retaining larger diameter trees (12-inch DBH and larger) wherever possible on-site, may additionally minimize the potential for negative impacts to bats. Trees with loose, rough bark such as maples, hickories, and oaks are more desirable than other tree species due to the increased cover that the loose bark provides. Large trees with cavities are also utilized by different bat species.
- Leave Dead and Dying Trees Standing. Like most eastern bats, the northern long-eared and tri-colored bats roost in trees during summer. Where possible and not a safety hazard, leave dead or dying trees on the property. Northern long-eared and Tri-colored bats and many other animals use these trees.

If these protection strategies are followed then the proposed activities will lessen the impact on bats. This determination is good for two years. Please re-submit an NDDB Request for Review if the scope of work changes or if work has not begun on this project by March 12, 2022.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection’s Natural History Survey, cooperating units of DEEP, landowners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDB should not be substitutes for on-site surveys necessary for a thorough environmental impact assessment. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the database as it becomes available.
Please contact me if you have further questions at (860) 424-3090, or DEEP_Nddbrequect@ct.gov. Thank you for consulting the Natural Diversity Database.

Sincerely,

/sg Geoffrey Krukar
Wildlife Biologist
Location: Lake Avenue, Greenwich, CT
NODDB Determination No.: 201911037
Description: Area restricted from tree cutting and land clearing due to Federally Threatened Northern long-eared bat.
Lake Avenue
Greenwich, CT

Site Photos

PHOTO 1: View towards proposed Lot #1 driveway entry.

PHOTO 2: View south towards Lot #1 proposed house site.
Site Photos

PHOTO 3: View towards Lot #2 driveway entry.

PHOTO 4: View west of wetland-crossing area.
Lake Avenue
Greenwich, CT

Site Photos

PHOTO 5: View north of wetland-crossing area.

PHOTO 6: View south of wetland-crossing area.
PHOTO 7: View north towards Lot #2 proposed house site.