Newington Walk
Open Space Subdivision

New Inland Wetlands and Watercourses Application

Newington, Connecticut

Eastern Connecticut
Environmental Review Team Report

Eastern Connecticut Resource Conservation & Development Area, Inc.

Newington Walk
Open Space Subdivision
New Inland Wetlands & Watercourses Application

Prepared by the
Eastern Connecticut
Environmental Review Team

Of the Eastern Connecticut Resource Conservation & Development Area, Inc.

For the Conservation Commission
Newington, Connecticut

December 2012

 # 632

Acknowledgments

This report is an outgrowth of a request from the Newington Conservation Commission to the Connecticut River and Coastal Conservation District (CRCCD) and the Eastern Connecticut Resource Conservation and Development Area (RC&D) Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The Eastern Connecticut Environmental Review Team Coordinator, Elaine Sych, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this report.

The field reviews took place on Monday, November 19, 2012, Wednesday, November 28, 2012, and Monday, December 3, 2012.

Robin Adamcewicz	Wildlife Technician DEEP – Eastern District Headquarters (860) 295-9523
Nelson DeBarros	Botanist/Ecologist DEEP – Wildlife Division Natural History Survey – Natural Diversity Data Base (860) 424-3585
Kelly Starr	Natural Resource Specialist Connecticut River and Coastal Conservation District (860) 346-3282
Charlotte Pyle	Landscape Ecologist USDA – Natural Resources Conservation Service (860) 871-4066
Neal Williams	Environmental Analyst III DEEP – Stormwater Management (860) 424-3356
Christopher Malik	Watershed Coordinator DEEP – Water Resources (860) 424-3959

I would also like to thank Chris Greenlaw, town engineer, Eric Hinckley, Newington engineering technician, and Raymond Gradwell, civil engineer, BL Companies, for their cooperation and assistance during this environmental review.

Prior to the review days, each Team member received a summary of the proposed project with location and aerial photos. During the field reviews Team members received additional information, reports and plans. Following the field reviews the Team members received additional consultant reports and revised plans in electronic form. Reports from each Team member were submitted to the ERT coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site plans or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project - all final decisions rest with the Town and applicant. This report identifies the existing resource base and evaluates its significance to the proposed use, and also suggests considerations that should be of concern to the town. The results of this Team action are oriented toward the development of better environmental quality and the long term economics of land use.

The Eastern Connecticut RC&D Executive Council hopes you will find this report of value and assistance in reviewing the proposed plans for this open space subdivision.

If you require additional information please contact:

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Introduction

Introduction

The Newington Conservation Commission requested Environmental Review Team (ERT) assistance in reviewing a new inland wetlands application for the Newington Walk Open Space Residential Subdivision. The ERT conducted a study and a report was issued August 2011 for a previous inland wetland application. The ERT agreed to a limited review of the new application.

The 73.73 acre site is located in northeast Newington on the west side of Russell Road (SR424). The site is bounded by Russell Road to the east, the Connecticut Humane Society to the southeast, undeveloped forest to the south, property owned by the Town of Newington to the southwest, Mountain Road to the west, and property owned by the Balf Company and the State of Connecticut to the north.

The project site is currently undeveloped forest with wetlands and watercourses. Although privately owned there are numerous hiking trails that have been used by the public for many years.

The site is zoned for residential development and the applicant is proposing an Open Space Residential Development allowing a minimum lot size of 12,000 square feet with 80 feet of road frontage. The site will be served by public water and sewer.

The proposed project has been revised to include a 48 lot subdivision with four public roads that end in cul-de-sacs. The access to the project will be from Russell Road. A stormwater management system will be constructed with five detention basins. Development will take place on approximately 29 acres with the remaining 44 acres to be dedicated open space.

The plans incorporate new environmental design features such as an amphibian tunnel to connect two of the three wetlands, a biofilter swale to intercept and remove contaminants prior to releasing down gradient to the wetlands. Also a mitigation area is offered as an enhancement to the total wetland area.

Objectives of the ERT Study

The town is requesting a review of the new application as it pertains to the ecology, wildlife biology, erosion and sediment control plans, stormwater management and water quality so that town commissioners can make decisions based on adequate information regarding the environmental impacts and potential mitigation measures regarding the proposed development. The town has also hired private consultants to review the geology and blasting and ecological concerns.

The ERT Process

Through the efforts of the Newington Conservation Commission this environmental review and report was prepared for the Town of Newington.

This report provides an information base and a series of recommendations and guidelines which cover some of the issues of concern to the town. Team members were able to review maps, plans and supporting documentation provided by the town and the applicant.

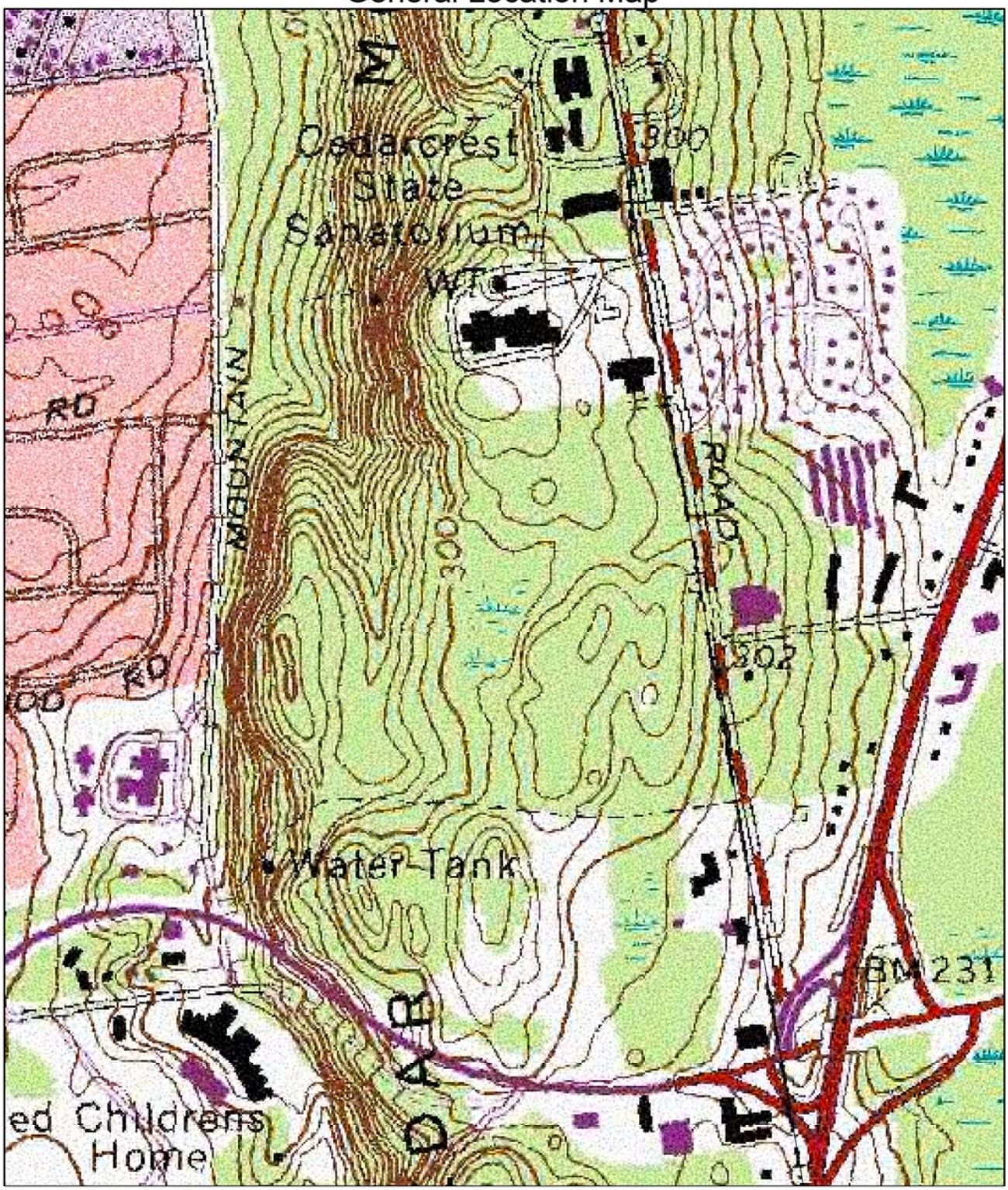
The review process consisted of four phases:

1. Inventory of the site's natural resources;
2. Assessment of these resources;
3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

The data collection phase involved both literature and field research. The field reviews were conducted Monday, November 19, Wednesday, November 28 and Monday, December 3, 2012. All but one team member had participated in the August 2011 ERT report. One team member did a plan and report review only, and did not re-visit the site. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into this final ERT report.

Newington Walk Open Space Residential Subdivision
General Location Map



The Connecticut Environmental Review Team

This map was prepared by Amanda Fargo-Johnson for the Connecticut Environmental Review Team.
This map is for educational use only.
It contains no authoritative data.
June 2011.

0 0.045 0.09 0.18 0.27 Miles

Newington, CT

Newington Walk Open Space Residential Subdivision
Aerial Map

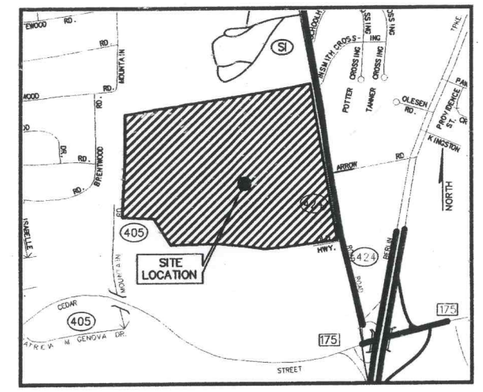
The Connecticut Environmental Review Team

This map was prepared by Amanda Fargo-Johnson for
the Connecticut Environmental Review Team.
This map is for educational use only.
It contains no authoritative data.
June 2011.

0 0.045 0.09 0.18 0.27 Miles

Newington, CT

VICINITY MAP



LOCATION MAP

SCALE: 1"=800'

ZONING INFORMATION

LOCATION:	NEWINGTON, CONNECTICUT			
ZONE:	R20 (OPEN SPACE SUBDIVISION TO CONFORM WITH LOT REQUIREMENTS FOR THE R-12 ZONE)			
USE:	OPEN SPACE SUBDIVISION			
ITEM #	ITEM	REQUIREMENTS	PROPOSED	VARIANCE
1	MINIMUM LOT AREA	20,000 S.F.	> 12,000 S.F.	NO
2	MINIMUM LOT FRONTAGE	100 FEET	> 80 FEET	NO
3	MINIMUM FRONT SETBACK	35 FEET	> 35 FEET	NO
4	MINIMUM SIDE SETBACK	10 FEET	> 10 FEET	NO
5	MINIMUM REAR SETBACK	35 FEET	< 30 FEET	NO
6	MAXIMUM BUILDING HEIGHT	2.5 STORIES/35 FEET	2.5 STORIES/35 FEET	NO
7	MAXIMUM BUILDING COVERAGE	90 PERCENT	< 90 PERCENT	NO

MAXIMUM DENSITY

SITE AREA (X) – WETLANDS (Y)/ MINIMUM AREA FOR R-20 ZONE = (Z)

(3,211,817.48 S.F. – 167315.9) / 20,000 S.F. = 150 UNITS ALLOWED
48 UNITS PROPOSED

MAXIMUM CUL-DE-SAC LENGTH

MOUNTAIN DRIVE = 1,378 L.F. TO RUSSELL ROAD

TRAP ROCK WAY = 930 L.F. TO RUSSELL ROAD

TRAIL SIDE DRIVE = 382 L.F. TO RUSSELL ROAD

VISTA DRIVE = 925 L.F. TO RUSSELL ROAD

MAXIMUM ALLOWABLE CUL-DE-SAC LENGTH = 1,600 LINEAR FOOT FROM CENTERLINE INTERSECTION OF STREETS TO END OF CUL-DE-SAC.

MAXIMUM OPEN SPACE

– MINIMUM OF 5 ACRES OR PERCENTAGE OF ENTIRE PARCEL WHICH EACH LOT WILL BE REDUCED 12,000/ 20,000 = 0.40 X 100 = 40%

– OPEN SPACE REQUIRED 0.4 X 3,211,817.48 S.F. = 1,284,726.99 S.F. (29.49 AC.)

– OPEN SPACE PROPOSED = 1,951,310 S.F. (44.8 AC.)

LEGEND

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- SETBACK LINE
- UTILITY EASEMENT (20' WIDE)
- DRAINAGE EASEMENT (WIDTH VARIES)
- DRIVEWAY AND SIDEWALK EASEMENT (WIDTH VARIES)
- PROPOSED BOUNDARY MONUMENT
- PROPOSED IRON PIN

CEDAR MOUNTAIN TRAPROCK RIDGELINE

CEDAR MOUNTAIN TRAPROCK RIDGELINE MEANS THE LINE ON THE CEDAR MOUNTAIN TRAPROCK RIDGE CREATED BY ALL POINTS AT THE TOP OF A FIFTY PER CENT SLOPE, WHICH IS MAINTAINED FOR A DISTANCE OF FIFTY HORIZONTAL FEET PERPENDICULAR TO THE SLOPE AND WHICH CONSISTS OF SURFICIAL BASALT GEOLOGY, IDENTIFIED ON THE MAP PREPARED BY STONE ET AL., UNITED STATES GEOLOGICAL SURVEY, ENTITLED "SURFICIAL MATERIALS MAP OF CONNECTICUT". THE BASE MAP FOR TRAPROCK RIDGELINE TOPOGRAPHIC DELINEATION SHALL BE THE CURRENT PUBLICLY AVAILABLE METROPOLITAN DISTRICT COMMISSION MAPS FOR THE TOWN OF NEWINGTON. (EFFECTIVE 5-20-05)

RIDGELINE SETBACK AREA: MEANS THE AREA BOUNDED BY (A) A LINE THAT PARALLELS THE RIDGELINE AT A DISTANCE OF ONE HUNDRED FIFTY FEET ON THE MORE WOODED AREA OF THE RIDGE, AND (B) THE CONTOUR LINE WHERE A RIDGE OF LESS THAN FIFTY PERCENT IS MAINTAINED FOR FIFTY FEET OR MORE ON THE ROCKIER SIDE OF THE SLOPE. MANMADE SLOPES OF 50% OR GREATER SHALL NOT BE CONSIDERED AS A PART OF ANY TRAPROCK RIDGELINE. THE BURDEN OF PROOF THAT SUCH A

APPROVED BY THE NEWINGTON CONSERVATION COMMISSION

PETITION NO _____

AT THE MEETING OF: _____

CHAIRMAN: _____

BL Companies

ARCHITECTURE
ENGINEERING
PLANNING
LANDSCAPE ARCHITECTURE
LAND SURVEYING
ENVIRONMENTAL SCIENCES

355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

NEWINGTON WALK

RUSSELL ROAD
NEWINGTON, CONNECTICUT

XZ10C364101 ; XZ10C364102 ; XZ10C364103 ; XC10C364101 ; tsmith1 ; B010C364101

REVISIONS

No.	Date	Desc.

Designed	R.G.
Drawn	T.A.M.
Checked	
Approved	
Scale	1"=200'
Project No.	10C3641
Date	09/13/12

CAD File: RS10C364100

Title

RECORD SUBDIVISION PLAN

VICINITY MAP

LEGEND

- PROPOSED PROPERTY LINE
- STORM SEWER
- CONSTRUCTION LIMIT LINE — LOD —
- LIMITS OF CLEARING
- SANITARY SEWER — S — S —
- WATER LINE — W — W —
- TELECOMMUNICATIONS LINES — ETC —
- DRAINAGE EASEMENT (WIDTH VARIES)
- DRIVEWAY AND SIDEWALK EASEMENT (WIDTH VARIES)
- STORM FLARED END SECTION
- STORM WATER QUALITY STRUCTURE
- STORM MANHOLE
- STORM CATCH BASIN
- EXISTING STORM CATCH BASIN
- FIRE HYDRANT
- ELECTRIC TRANSFORMER
- SANITARY MANHOLE
- EXISTING LIGHT POLE

LEGEND

WQ – WATER QUALITY UNIT TO REMOVE 80% TOTAL SUSPENDED SOLIDS ON AN ANNUAL BASIS

CB – CATCH BASIN TYPE "C" OR TYPE "C–L". ALL CB'S TO BE TYPE "C" UNLESS OTHERWISE NOTED.

MH – MANHOLE

ES – FLARED END SECTION

HOME FINISHED FLOOR ELEVATIONS

UNIT #	T.W. (TOP OF WALL)	G.F. (GARAGE FLOOR ELEVATION)	B.F. (BASEMENT FLOOR ELEVATION)	NOTES
1	316.37	315.70	307.83	WALKOUT
2	322.37	321.70	313.83	WALKOUT
3	327.97	327.30	319.43	WALKOUT
4	332.97	332.30	324.43	WALKOUT
5	336.87	336.20	328.33	WALKOUT
6	337.17	336.50	328.63	WALKOUT
7	321.35	320.68	312.81	
8	336.57	335.90	328.03	WALKOUT
9	313.97	311.30	305.43	2' DROP SLAB
10	320.27	317.60	311.73	2' DROP SLAB
11	325.87	323.20	317.33	2' DROP SLAB
12	329.47	328.80	320.93	
13	334.27	333.60	325.73	
14	338.87	338.20	330.33	
15	339.27	336.60	330.73	2' DROP SLAB
16	345.07	344.40	336.53	WALKOUT
17	343.47	342.80	334.93	WALKOUT
18	340.07	339.40	330.53	WALKOUT
19	338.67	338.00	330.13	WALKOUT
20	336.47	335.80	327.93	WALKOUT
21	334.27	333.60	325.73	WALKOUT
22	332.07	331.40	323.53	WALKOUT
23	332.37	331.70	323.83	
24	334.19	333.52	325.65	

UNIT #	T.W. (TOP OF WALL)	G.F. (GARAGE FLOOR ELEVATION)	B.F. (BASEMENT FLOOR ELEVATION)	NOTES
25	335.81	335.14	327.27	
26	338.05	337.38	329.51	WALKOUT
27	339.94	339.27	330.73	WALKOUT
28	341.02	340.35	332.48	WALKOUT
29	342.54	341.87	334.00	WALKOUT
30	341.87	341.20	333.33	WALKOUT
31	328.87	328.20	320.33	WALKOUT
32	322.17	321.50	313.63	WALKOUT
33	324.67	324.00	316.13	WALKOUT
34	328.67	328.00	320.13	
35	326.87	326.20	318.33	
36	320.07	319.40	311.53	
37	316.57	315.90	308.03	
38	327.21	319.00	319.67	TUCK UNDER
39	329.47	326.80	320.93	2' DROP SLAB
40	330.87	330.20	322.33	
41	328.47	327.80	319.93	
42	325.07	324.40	316.53	
43	317.47	316.80	308.93	
44	313.17	312.50	304.63	WALKOUT
45	314.17	313.50	305.63	WALKOUT
46	317.47	316.80	308.93	
47	325.07	324.40	316.53	
48	324.07	323.40	315.53	

BL Companies

ARCHITECTURE
ENGINEERING
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NEWINGTON WALK
RUSSELL ROAD
NEWINGTON, CONNECTICUT

REVISIONS

No.	Date	Desc.

Designed	R.G.
Drawn	A.B.U.
Checked	
Approved	
Scale	1"=200'
Project No.	10C3641
Date	09/13/12

CAD File: GD10C364101

Title

GRADING AND DRAINAGE PLAN

0C364101 ; XZ10C364102 ; XZ10C364103 ; XC10C364101 ; tbmelbel ; BD10C364101 ; XC10C364103 ; XC10C364102 ; XC10C364104

Connecticut River Coastal Conservation District Review

The following are general comments and recommendations regarding the revised plans submitted for the proposed 73.3 acre Newington Walk subdivision on Russell Road, Newington, CT. Activities proposed include the development of 48 residential building lots, four subdivision roads and cul-de-sacs, five detention structures, a road drainage system including catch basin hoods, catch basin sumps and hydrodynamic separators, and associated utilities; and the preservation of approximately 60% of the site as open space.

Comments in this report are based on a review of:

- a series of site plans entitled "Town of Newington Inland Wetlands & Watercourses Submission, Toll Brothers, Inc., Newington Walk, Russell Road, Newington, CT" prepared by B.L. Companies and dated September 13, 2012 rev. November 13, 2012
- correspondence dated November 28, 2012, from REMA regarding questions for the applicant presented at the 11-13-2012 public hearing
- correspondence dated November 30, 2012, from Dru Associates, Inc. to the Newington Inland Wetland Commission regarding responses to comments from the 11-13-2012 public hearing
- correspondence dated December 5, 2012 from LBG, Inc. regarding hydrological responses to REMA comments from the11-30-2012 public hearing
- Questions regarding blasting for the Newington Walk Project
- Newington Walk Blast Plan prepared by DRS Seismic Consultants, Inc
- two (2) Cut/Fill Location reports/maps, prepared by Toll Brothers, Inc. dated November 30, 2012
- Individual Cut/Fill report prepared by Toll Brothers, Inc. dated November 30, 2012
- correspondence dated November 12, 2012 from BL Companies regarding responses to comments
- correspondence dated November 8, 2012 from Dru Associates, Inc. to the Newington Inland Wetland Commission regarding Public Hearing Comment Responses
- correspondence dated November 8, 2012 from LBG, Inc. to the Newington Inland Wetland Commission regarding responses to questions and comments from the 10-16-2012 public hearing
- a mitigation plan prepared by Dru Associates, dated August 2012
- a narrative submitted to the Town of Newington Inland Wetland and Watercourse Commission prepared by BL Companies, dated September 13, 2012
- correspondence dated August 29, 2012 from LBG to the Town of Newington regarding the Hydrological Impact Assessment Report
- correspondence dated August 29, 2012 from Dru Associates, Inc. to the Newington Inland Wetland Commission regarding the Connecticut Environmental Review Report

- Newington Walk Open Space Residential Subdivision, Newington, Connecticut, Eastern Connecticut Environmental Review Team Report (ERT), dated August 2011
- a site walk on November 19, 2012

The comments below are advisory in nature and are intended to assist municipal land use commissioners in their charge.

Current Site Conditions

The proposed development site consists of a large parcel of undeveloped woodland, with three wetlands located on the site. In the western portion of the site, there is a wetland system and watercourse that flows south to north. The second wetland system is located in the central portion of the site and has been described in this application by Dru Associates, Inc. as a large isolated horseshoe shaped pond and wetland. Field studies conducted by Dru Associates, Inc. determined that this pond supports large populations of obligate aquatic breeding herpetofauna, including spotted salamanders and wood frogs. In the eastern portion of the site, there is a pond depression that fills with water seasonally. In field studies conducted by Dru Associates, abundant populations of snails and mosquito larvae were observed in the small pond depression. One of the unique features of this parcel is the Cedar Mountain Traprock Ridgeline, located in the western portion of the property. The topography of the site is moderate (in the eastern central portion of the site) to steep in the western portion of the site, where the ridgeline is located. A description of the soils located on the site is included in the Conservation District comments in the August 2011 ERT Report.

Comments and Recommendations

The proposed development is an open space residential subdivision, located in the eastern portion of the parcel (approximately 29 acres). The remaining portion of the parcel (approximately 44 acres) will remain as open space.

In this application, there are no activities proposed within the wetlands/watercourses or regulated areas identified. Although there are no direct impacts to these areas, there is the potential for indirect impacts caused by construction activities and land development that alters the hydrology and habitat of the site. Construction impacts can be minimized through the design, installation, and maintenance of soil erosion and sedimentation controls; project phasing/sequencing and scheduling construction activities to avoid disruption to wildlife during mating/nesting and migration seasons. Changes to site hydrology can be minimized by installing appropriate stormwater management practices, including Low Impact Development (LID) practices, and maintaining upland buffers. Indirect impacts to habitat can be minimized by site designs that avoid fragmentation, limiting onsite clearing, and controlling invasive species.

Erosion and Sedimentation Control Recommendations

The E&S control plan should be developed and implemented in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Controls (2002 Guidelines).

- The amount of land and duration of disturbance should be kept to a minimum during the construction of the subdivision road, driveways, stormwater management structures, and residential lots. Additional details should be included on the site plan concerning phasing and sequencing.

- Three temporary sediment traps (contributing drainage area < 5 acres) are shown on the site development plan. Both the wet and dry storage volumes for the sediment traps should be included on the plans. A sediment removal threshold of one foot is identified on the site plan. It should be confirmed that this volume is equivalent to half of the wet storage volume as detailed in the 2002 Guidelines.

  The temporary sediment traps are proposed for removal once the contributing drainage areas are stabilized. The development plan should detail a restoration plan to re-grade, re-vegetate, and stabilize the areas.

- There are five sediment basins proposed; four of these basins are in the same location as future detention basins. Sediment removal and functional improvement strategies should be detailed for each structure.

- Maintenance requirements for permanent E&S control measures (e.g. sediment forebays, level spreaders, riprap splash pads, etc.) should be included.

- The E&S control plan should specify or include the following:

  a) Temporary seeding or non-vegetated protection of all exposed soils and slopes will be initiated within the first 7-days of suspending work in any area left longer than 30 days and less than one year.
  b) Stockpiles are to be seeded and stabilized if left undisturbed for a period of 30 days or more (located on page 5-2-3 of the 2002 Guidelines); not 2 months, as stated in the notes of the Erosion and Sedimentation Control plan.
  c) Erosion control blankets will be inspected once a week and within 24 hours of the end of a rainstorm (with a rainfall amount of 0.5” or greater) for failure, washouts or breakouts, in accordance with guidance maintenance of erosion control blankets in the 2002 Guidelines.
  d) The name of the contractor and a contact person responsible for maintaining the E&S control measures should be included on the site plan.
  e) A winter stabilization plan should be provided in case there are disturbed areas or exposed soil if/when construction halts in the late fall/early winter.

Stormwater Management Recommendations

- As previously recommended in the August 2011 ERT report by the Conservation District and the Department of Energy and Environmental Protection (DEEP), low impact development (LID) design practices (in addition to those currently proposed, cluster development and bioswale filters) should be incorporated into the site design. The 2004 Connecticut Stormwater Quality Manual (2004 Stormwater Manual) defines LID as "a site design strategy intended to maintain or replicate predevelopment hydrology through the use of small-scale controls integrated throughout the site to manage run-off as close to the site as possible."

  a) Some of the LID practices outlined in the previous ERT report included incorporating the use of pervious pavers; shared driveways; modifications to curbing (notch curbing or no curbing) to direct the water into vegetated swales; tree box trenches; and rain gardens.

  One specific LID recommendation (mentioned in the previous report) that should be strongly considered, is installing a rain garden/infiltration island in the center of the four cul-de-sacs, if site conditions are favorable and allow for proper infiltration. This will minimize the amount of stormwater run-off generated from the impervious road surface. The rain gardens can be planted with native species that are adapted to the site conditions and require relatively little maintenance.

  b) The discharge location for footing drains, curtain drains, and roof leaders should be shown on the site development plans. Discharge of clean ground water and stormwater from footing drains and roof leaders to the road drainage system should be discouraged. Instead, localized infiltration should be incorporated (e.g., rain gardens, bioretention).

- A bioswale filter is proposed in the rear of lots 27-30, 32 and 37.

  a) Additional details regarding the bioswale filter should include:

    i. Requirements for maintaining the constructed bioswale filter.

    ii. A schedule for routine maintenance.

    iii. Details on invasive species monitoring and control.

    iv. The organization responsible for routine maintenance and inspections should be identified.

  b) To ensure that the bioswales are accessible for inspection and maintenance, they should be located within an easement.

- As shown on the site plan, detention basins are a major component of the stormwater management system. Additional details as outlined below should be included on the site plan.

  a) The planting plan for the detention basins should include:

    i. A monitoring plan/schedule for plant establishment and survival, and replacement if necessary.

ii. Details on invasive species monitoring and removal.

b) The site plan identified that the Homeowner's Association (HOA) will be responsible for the maintenance of the detention basins. Details should be provided as to when the HOA will assume responsibility for the detention basins. The HOA should be provided with a detailed guidance and maintenance plan to ensure the detention basins are maintained and functioning properly.

Wetlands and Watercourses Recommendations

- Pre-development hydrology should be preserved to the greatest extent possible. Maintaining intact vegetated wetland buffers will help maintain pre-development hydrology and water quality. In addition, opportunities to minimize the amount of residential lawn, semi-impervious, and impervious surfaces in the upslope contributing drainage area of the wetlands and detention basins, should be evaluated and incorporated where appropriate.

- The proposed location of Traprock Way isolates the pond depression wetland from the available habitat (horseshoe shaped wetland and wooded uplands) located to the west. An amphibian crossing is proposed to allow movement between these areas.

  a) If the following have not been addressed, additional information should be provided regarding the amphibian tunnel crossing:

  i. Details regarding the proposed schedule for installation of the crossing, and measures that will be implemented during construction to minimize potential impacts to the amphibian populations that have been documented in this area.

  ii. A plan detailing the maintenance and inspection requirements of the amphibian tunnel. Information should also be provided concerning who will be responsible for routine inspection and maintenance.

  iii. A monitoring plan to document movement of species through the tunnel.

  b) Consideration should be given to installing an educational sign at the amphibian crossing, which discusses the species that have been identified using the wetland habitat, the intended function of the tunnel, and ways homeowners in the development can help protect the wetlands.

- The site plan should specify that dust control chemicals (other than water) will not be used in wetland crossing areas on in the 100-foot upland review buffer.

General Comments

- Erosion Control Notes – Contingency Erosion Plan – The Town of Newington is located within the Connecticut River Coastal Conservation District. This note should be changed to reflect this.

Stormwater Management Review
(August 2011/Addendum December 2012)

Runoff from construction and post-construction activities has the potential to pollute wetlands and watercourses downstream of stormwater discharge locations. During the period of construction, the discharge of sediment, particularly during significant storm events, could occur even when non-structural and structural erosion and sediment controls are installed. Post construction, the increase in the quantity and peak flow of stormwater runoff, could contribute to downstream flooding and erosion problems. Additionally, the quality of stormwater runoff (post construction) could be degraded by the presence of pollutants such as total suspended solids, nutrients, and pesticides from streets and yards.

In order to minimize the pollution potential from stormwater, the following is a list of recommended management measures:

- Establish setback or buffer areas (50 feet, minimally, to 100 feet, preferably) within upland areas that are adjacent to wetlands or watercourses.
- Promote sheet flow to the maximum extent possible, by eliminating curbs, utilizing pervious pavement, installing vegetative swales, and employing level spreaders.
- Infiltrate stormwater discharges to the maximum extent possible to promote groundwater recharge and lessen the quantity of runoff needing treatment.
- Install structural stormwater management measures to treat stormwater runoff during construction. Such measures include, but are not limited to, earthen dikes/ diversions, sediment traps, check dams, level spreaders, gabions, temporary or permanent sediment basins and structures.
- Prepare a stormwater management plan, which considers both quantity and quality of runoff for the entire development site, rather than piecemeal during development of each lot.

The construction of the Toll Brothers Newington Subdivision, (“site”) will be regulated by the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities (“the construction general permit”). In accordance with Sections 4(c) and 6(b)(6) of the construction general permit, respectively, a registration form must be filed and a Pollution Control Plan (“PCP”) must be prepared and implemented. The following review comments are based upon the requirements of the construction general permit.

Prior to submitting a registration form to the DEP, a review to verify compliance with State and National Historic Preservation statutes, regulation and policies and Endangered and Threatened Species Statutes must be conducted. Please contact the Historic Commission at 860-566-3005 for the historic preservation review. Endangered & Threatened species Information is available online at http://www.dep.state.ct.us/cgnhs/nddb/nddbpdfs.asp. If endangered/ threatened species are present in the project area, please contact Dawn McKay of the DEEP Bureau of

Natural Resources at 860-424-3592. The project will not be permitted under the construction general permit until compliance with these regulations/ statues is achieved.

The owner or developer must register the site with the Department of Energy and Environmental Protection ("DEEP") thirty days prior to the commencement of construction activity. The Pollution Control Plan ("the PCP") must be prepared and kept on site during the entire life of the construction project for sites with soil disturbance between 5-10 acres. The PCP is required to be submitted to the DEEP with the registration form for sites with soil disturbance greater than 10 acres.

The PCP must include a site map as described in Section 6(b)(6)(A) of the construction general permit and a copy of the erosion and sedimentation (E & S) control plan for the site. An E & S plan which has been approved by the Town of Newington in conjunction with the DEEP Inland Water Resources Division (IWRD) and the local Soil and Water Conservation District may be included in the PCP. The PCP and site map must include specifics on controls that will be used during each phase of construction, pursuant to Section 6(b)(6)(B) of the construction general permit. Specific site maps and controls must be described in the PCP, as well as construction details for each control used. The construction general permit requires that the plan shall ensure and demonstrate compliance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control ("the guidelines"). The Plan must be flexible to account for adjustment of controls as necessary to meet field conditions.

In order to reduce erosion potential, DEEP recommends that construction activities be phased to the maximum extent possible so that unstable areas are minimized. The construction general permit also requires that any inactive area left disturbed for over 7 days be temporarily stabilized. Areas left disturbed over 30 days must be temporarily seeded. The PCP must specify a stabilization plan (within and outside of the seeding season) which includes such measures as seeding, applying hay/ mulch, and, for slopes 3:1 and steeper, installing an appropriate grade of erosion control matting or a spray-on "soil cement" type of armor mulch.

The PCP must demonstrate that the post-construction stormwater treatment system has been designed with a goal of 80% removal of total suspended solids, pursuant to Section 6(b)(6)(C)(iii)(1) of the construction general permit. Such measures may include, but are not limited to, stormwater detention basins, stormwater retention basins, swirl concentrator technology structures (such as Vortechnics, Downstream Defender, Stormceptor, Stormtreat, or similar), vegetated swales, deep catch basin sumps (4'+) and stormwater infiltration devices. The PCP must also discuss the installation of velocity dissipation devices at all discharge locations as a post construction stormwater management measure. A detail of proposed measures must be provided. If site conditions allow, DEEP recommends the installation of retention or detention basins because of maintenance, cost, and efficiency considerations. The elimination of point sources through the use of level spreaders or curb elimination is also recommended.

The construction general permit (Section 6(b)(6)(D)) requires inspections of all areas at least once every seven calendar days and after every storm of 0.1 inches or greater. The PCP must also allow for the inspector to require additional control measures if the inspection finds them necessary, and should note the qualifications of personnel doing the inspections. Additionally, the PCP must include monthly inspections of stabilized areas for at least three months following stabilization.

The following are comments specific to review of the erosion and sediment control plans for the site, and a site walk conducted on July 13, 2011:

- Special care should be used throughout the construction of the Subdivision. The site has some steep slopes and the soils are highly erodible. It is imperative that all applicable erosion and sediment controls be properly placed and maintained for the duration of the project and inspection schedules be strictly adhered to.

- During construction, a sediment trap and/ or a sediment basin with the ability to store 134 cubic yards of water storage per acre drained must be installed for drainage areas greater than 2 acres. For drainage areas where more than 5 acres is disturbed at any time, a sediment basin with an outlet engineered to remove sediment must be installed. The sediment forebays should be sized for 10% of the water quality volume with a 2:1 length to width ratio and designed in accordance with the guidelines specified in the 2004 CT Stormwater Quality Manual. In order to promote velocity reduction and solids settling, DEP recommends constructing the forebay berms with appropriate size of riprap with a core of stone (DOT #3).

- The detention basin on the western boundary of the subdivision, (detailed on sheet EC-5, “old plans”) shows a level spreader lip that discharges to a slope of greater than 10%. This is not consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control as those guidelines mandate that level spreaders discharge to a slope of no greater than 5%. DEEP is aware of instances where level spreaders discharging to slopes greater than 5% have failed causing erosive releases of sediments into wetlands and watercourses. A discharge of sediment to a wetland or watercourse without a permit would be a violation of Sections 22a-430 and 22a-42a(c)(1) of the Connecticut General Statutes and may require remedial action.

- Place all sediment clean outs from sumps, silt fencing and basins on upland soils.

In order to reduce the impact of development and address stormwater quality issues, the Department strongly encourages the use of Low Impact Development (LID) measures. LID is a site design strategy intended to maintain or replicate predevelopment hydrology through the use of small-scale controls integrated throughout the site to manage stormwater runoff as close to its source as possible. Infiltration of stormwater through LID helps to remove sediments, nutrients, heavy metals, and other types of pollutants from runoff.

Key strategies for effective LID include: infiltrating, filtering, and storing as much stormwater as feasible, managing stormwater close to where the rain/snow falls,

managing stormwater at multiple locations throughout the landscape, conserving and restoring natural vegetation and soils, preserving open space and minimizing land disturbance, designing the site to minimize impervious surfaces, and providing for maintenance and education. Water quality and quantity benefits are maximized when multiple techniques are grouped together. In areas of compacted and/or possibly contaminated soils, soil suitability should be further investigated prior to selecting optimum treatment and/or remediation measures. Where soil conditions permit, we typically recommend the utilization of one, or a combination of, the following measures, some of which have been touched on previously:

- the use of pervious pavement or grid pavers, or impervious pavement without curbs or with notched curbs to direct runoff to properly designed and installed infiltration areas;
- the use of vegetated swales, tree box filters, and/or infiltration islands to infiltrate and treat stormwater runoff (from building roofs and roads);
- the minimization of access road widths and parking lot areas to the maximum extent possible to reduce the area of impervious surface;
- the use of dry wells to manage runoff from building roofs;
- the installation of rainwater harvesting systems to capture stormwater from building roofs for the purpose of reuse for irrigation (i.e. - rain barrels for residential use and cisterns for larger developments);
- the use of residential rain gardens to manage runoff from roofs and driveways;
- the use of vegetated roofs (green roofs) to detain, absorb, and reduce the volume of roof runoff; and
- providing for pollution prevention measures to reduce the introduction of pollutants to the environment.

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ADDENDUM: December 11, 2012

The plans dated September 13, 2012 which were resubmitted to this department on December 3, 2012 were reviewed. Although some positive steps have been taken to improve overall stormwater quality over the previous submittal, certain aspects of the design are not in accordance with the standards specified in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control and /or appear to be lacking needed information.

There remains a detention basin (#4) that discharges via a level spreader to a slope greater than 5%. As articulated in the preceding report, the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control mandate that level spreaders discharge to a **vegetated slope of no greater than 5%.** DEEP is aware of instances where level spreaders discharging to slopes greater than 5% have failed causing erosive releases of sediments into wetlands and watercourses. A discharge of sediment to a wetland or watercourse without a permit would be a violation of Sections 22a-430 and 22a-42a(c)(1) of the Connecticut General Statutes and may require remedial action.

Basin 1 and 2, as well as all associated appurtenances adjacent to Russell Road, will need complete vetting by the Connecticut Department of Transportation to assure these structures and discharges do not pose a threat to public safety.

Although not discussed in the plans E&S narrative, phasing on the site will need to be kept to the suggested five acre disruption. The five acre phasing will be necessary to control runoff from this steep and rocky site and to assure minimal impact to its thin and erodible soils.

Proper field placement and maintenance of all E&S controls cannot be overly stressed on this site. In addition, qualified personnel will need to adhere to all inspection guidelines. It may be in the host community's best inertest to draft a document specifically calling out the inspector's qualifications as well as inspection schedules.

A Watershed Perspective

General Watershed Characterization

The review area is known as Cedar Mountain within the Town Newington, Connecticut. The property is privately owned, but the public has accessed it for many years, and it is one of the few remaining parcels of undeveloped land in Newington. The Town of Newington requested assistance in conducting a natural resources inventory and assessment of this undeveloped area which is currently owned by a large construction and earth materials company. A proposal has been presented by a developer to purchase the property and create a 48 unit subdivision of single family homes and preserve a portion of the tract containing a traprock ridgeline, by donating it to the Town. Plans describing the proposed development were provided for review, as submitted to the Town for Inland Wetlands approvals. In addition, verbal commitments have been made by the developer to provide wetland mitigation in the form of a created wetland.

The major natural resources include a dry wooded bedrock ridge, basalt outcroppings and ledge, forest, vernal pools, and inland wetlands. Drainage on the west side of the property discharges northward to Piper Brook watershed, and on the east side is split between Cemetery Brook to the north and Goff Brook watersheds to the south, and east. Goff Brook (4010) is a tributary to the main stem of the Connecticut River. Piper Brook (4402) and Cemetery Brook (4400) both discharge to the South Branch of the Park River.

The property contains wetlands that are relatively isolated headwater wetlands. Headwater wetlands and streams can be very sensitive to changes in land cover that will occur if this proposed development is constructed. Extensive excavation, blasting, topographic modification will occur on adjacent developed areas. The potential for increases in impervious areas and stormwater volumes will result in long term changes to the wetland systems on site and downstream. Most of the wetlands downstream have already been affected by other developments in the area, but the scale of this development will result in hydraulic changes which could affect storm flows downstream. In particular, discharges to wetlands east of Russell Road and to the ConnDOT storm drainage systems serving Russell Road must be accurately quantified and easements negotiated where appropriate. The watersheds affected include a moderate density of residential and commercial development as well as highly developed commercial areas.

Water Quality Conditions

Surface and Ground Water Classification

The current State of Connecticut surface water quality classification for the South Branch Park River and its tributary Piper Brook is B. The River may not be meeting one or more of the water quality criteria, which support designated uses. These surface waters have designated uses for: aquatic life and wildlife; recreational uses; and agricultural/industrial

water supplies. The State of Connecticut Water Quality Standards, with associated Criteria for Surface Waters and Ground Waters, is available on-line at: www.ct.gov/deep/wqsc .

Goff Brook and Cemetery Brook are not classified so would default to Class A streams, with designated uses of potential water supplies; fish and wildlife habitat; recreational uses; and agricultural/industrial water supplies.

The current Connecticut ground water classification for the majority of the proposed development area is GA. There is a small area on the northeast side of the parcel, near Russell Road that is classified GA impaired. The designated uses for GA waters are: existing private and potential public or private supplies of water suitable for drinking without treatment; baseflow of hydraulically connected surface water bodies. CT DEP presumes that ground water in such areas is, at a minimum, suitable for drinking or other domestic uses without treatment. The management goal is to protect these designated uses of the ground water resources.

Water Quality Assessment

Existing water quality issues have been documented for Piper Brook and the South Branch of the Park River. The 2010 Connecticut Integrated Water Quality Report to Congress indicates that both are not meeting their water quality goals, so are classified as impaired for both primary contact recreation and aquatic life use support. As a result, the Town of Newington should require stormwater best management practices to reduce the likelihood of further degradation of water quality. New stormwater outfalls should not discharge unmanaged stormwater into jurisdictional wetlands, or sensitive areas.

Stormwater Management and Planning Considerations

The 2004 Connecticut Stormwater Quality Manual should be utilized for project design considerations. Information about urban stormwater characteristics can be found in Volume 2 of that manual, available on the Connecticut DEP website, at: http://www.ct.gov/dep/cwp/view.asp?a=2721&q=325704&depNav_GID=1654. The DEEP promotes this manual for use as a planning tool and design guidance document. The manual assists local (and state) land use commissions and government officials to design and review projects in a technically sound and consistent manner. A strong emphasis of the Manual is dedicated to site planning and design. This consists of preventative measures that address core causes of stormwater problems by maintaining the pre-development hydrologic functions and pollutant renovation mechanisms to the extent practical. Elements of such site design and planning include concepts raised in this review: alternative site design for transportation infrastructure and lot layout, watershed planning, and LID management practices. The manual recommends downstream resource selection criteria for several categories affecting estuary and coastal waterbodies. These categories include: stormwater ponds, stormwater wetlands, infiltration practice, filtering practices, and water quality swales.

The stormwater treatment for wetlands proposed should be managed to maximize pollutant removal specifically by maximizing detention times to promote pollutant removal by sedimentation; filtering practices (including sand filters and bioretention areas) to promote medium to high bacteria removal; and water quality swales to provide pretreatment of stormwater runoff and some minimal bacteria removal. Detention times greater than the Town's standard specification may be warranted given the intensity of land use proposed.

The long term success of intensive storm water best management practices in densely developed areas requires monitoring and maintenance as needed. A plan should be in place to manage all stormwater facilities, as well as guarantees that access to perform periodic maintenance will be maintained, and that this maintenance will be carried out.

A management plan for the preserved areas that will be deeded to the Town to preserve ecological integrity, and limit uses that may result in erosion, illegal dumping, or other detrimental practices would be useful to assist with maintenance of water quality. Provisions for pet waste management and litter control and management are recommended.

LID Site Planning and Design Considerations

The geological location of this proposed development on an area with relatively shallow soil depths to bedrock, and soils that are of low to moderate suitability for infiltration, makes some low impact practices less practical, or requires greater area and more engineering and construction costs than standard LID design strategies might allocate.

Low Impact Development (LID) is a combination of techniques designed to lessen our human impact on the broader environment. There are many well-documented ways, from nature-based site design to best management practices (BMPs) used across the region and beyond to accomplish this, and include open space residential design, rain garden/bioretention areas, permeable pavers and other "hard" surfaces, green roofs, water quality swales, and use of native or naturalized plantings. A major goal of LID is to mimic or restore the pre-development hydrology and natural processes of the site, or a similar undeveloped site nearby, by recognizing water on the site as an asset. This is accomplished, in part, by managing the resulting site runoff through evapotranspiration through vegetation and natural retention and infiltration to the ground to replenish nearby wetlands and streams and the regional groundwater resources, rather than a more traditional pipe and conveyance stormwater system.

More information can be found at CT DEEP's website:
Specific recommended links:

DEEP Low Impact Development and Municipal Outreach
http://www.ct.gov/dep/cwp/view.asp?a=2719&q=464958&depNav_GID=1654

2004 Connecticut Stormwater Quality Manual, including Low Impact Development Appendix:
http://www.ct.gov/dep/cwp/view.asp?a=2721&q=325704&depNav_GID=1654

2002 Connecticut Guidelines for Soil Erosion and Sedimentation Control, including Low Impact Development Appendix:
http://www.ct.gov/dep/cwp/view.asp?a=2720&q=325660&depNav_GID=1654

Connecticut Department of Environmental Protection Stormwater General Permits
http://www.ct.gov/dep/cwp/view.asp?a=2721&q=325702&depNav_GID=1654

Connecticut Integrated Water Quality Report to Congress
http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325610&depNav_GID=1654

The Center for Watershed Protection also publishes a great deal of useful and downloadable guidance on urban stormwater management practrices.
http://cwp.org/store/free-downloads.html

Landscape Ecologist Review

I. Explanation of Dru Associates' Inappropriate Use Harper *et al.*'s Model
Dru Associates' response to comments made by the ERT Landscape Ecologist in the 2011 ERT report is discussed below. The response was included in the letter dated August 29, 2012 sent by Dr. R.W. Abrams, CEP, of Dru Associates to the Newington Inland Wetlands Commission. Note that "Harper *et al.*" is shorthand for a scientific article entitled "Demographic Consequences of Terrestrial Habitat Loss for Pool-breeding Amphibians: Predicting Extinction Risks Associated with Inadequate Size of Buffer Zones" written by E.B. Harper, T.A.G. Rittenhouse, and R.D. Semlitsch and published in 2008 in the journal *Conservation Biology*, Volume 22, pages 1205-1215.

Dru Associates' letter said, "*The Landscape ecologist explained their interpretation of the Harper et al. research paper, but did not substantiate their contention that our use of the model was flawed.*"
Below, by summarizing the model and the goals of Harper *et al.*, the Landscape Ecologist will try again to explain why information about the model was used inappropriately by Dru Associates.

Dru Associate's letter said, "*Harper's work follows from a need for guidance on this topic, and Dru Associates applied the findings for expressly that purpose.*
The Harper *et al.* paper is not about providing numbers for people to use in real landscapes. Rather, the starting point for Harper *et al*. is a concern that the standard 30 meter (100 foot) buffer width of upland habitat around wetlands is not adequate wildlife habitat. As Harper *et al.* put it in the second paragraph of their Introduction:

> "For example, Massachusetts protects a terrestrial "buffer zone" of 30 m around some isolated wetlands. This buffer area protects wetlands somewhat, but does not provide adequate terrestrial habitat to maintain populations of many wetland-dependent birds, mammals, amphibians, reptiles, and plants…"

The stated point of Harper *et al.*'s research is found (as is standard) at the end of the paper's Introduction which says:

> "**To evaluate the population-level consequences of <u>reductions in terrestrial habitat</u> for pool-breeding amphibians**, we used published demographic data to develop matrix population models for 2 amphibian species, the wood frog (*Rana sylvatica*) and spotted salamander (*Ambystoma maculatum*). Both species depend on forest and breed in isolated wetlands throughout the northeastern United States. Nevertheless, differences in their life-history strategies and population dynamics may result in differing responses to terrestrial habitat loss.
>
> "**Through model simulations**, we **predicted** the **decline** and **risk of extinction** of wood frog and spotted salamander populations **resulting from truncation of terrestrial habitat** surrounding wetland breeding sites. Using an approach similar to that taken by Trenham and Shaffer (2005), we ran simulations for both species to estimate population size and

> probability of persistence resulting from a range of terrestrial habitat areas. We also evaluated how these predictions are influenced by **reductions in habitat quality** within the remaining terrestrial habitat and by the degree of **connectivity** among local populations." (Bolding and underlining added)

What Harper *et al.* are saying here is that given their concern that a 30 meter (100 foot) buffer was inadequate for pool-associated wildlife's upland habitat needs, they developed some population simulation models to look at what effects there are on the population numbers and the risk of extinction of wood frog and spotted salamander populations when (1) upland habitat is lost, (2) the quality of the remaining upland habitat is impaired, and (3) different amounts of connectivity are allowed.

The Harper *et al.* models simulate changes in population numbers by adding in new individuals (eggs) and taking away individuals (deaths). How many new individuals are added relates to how many adult females there are. How many deaths occur is a function of levels set by Harper *et al.* for the probability of continued survival at different stages of an individual's life. The probabilities were based on published field data from various sources. (Both in the real world and in the model, not many eggs make it to the reproductive adult stage even in ideal conditions.) Harper *et al.* worked with field data to make their model as "real" as possible in regard to things that affect births and deaths and the distances amphibians are found from vernal pools. They got their model working so that it had stable populations of frogs and salamanders.

The point of the simulation model was to have a way to test their questions about how a population would be affected by (1) reductions in upland habitat amount, (2) reductions in habitat quality and (3) different levels of connectivity (immigration of extra individuals from other pools). Under the starting conditions of the simulation, the stable populations were modeled as living in an upland habitat that extended out to 1000 meters from the pool. Based on another model that was based on some field data, Harper *et al.* came up with proportions of the modeled population that would be found at certain distances from the pool. Applying those proportions to their population model, they came up with numbers of wood frogs and spotted salamanders that would be found at various distances from the pool in the model.

Harper et al. used some words in confusing ways in their Table 3:
"Radius" means distance from the pool's edge.
"Carrying Capacity" means the maximum numbers of frogs or salamanders that would be allowed to "live" **in their model** in the upland habitat. As the radius decreases, the maximum number of frogs and salamanders allowed decreases.

In the world of the model, when the upland habitat is intact, there are 150 salamanders within a radius of 1000 meters. Table 3 of Harper *et al*. shows how the maximum number of salamanders allowed to live decreases with reductions in the amount upland habitat. As parameterized in the model, a radius of 290 meters contains 0.996 of the full population (149 salamanders) while a radius of 30 meters contains 0.365 (slightly more than 1/3) of the full population (55 salamanders).

The inputs to the population model were based on many variables, some of which were probabilities, not constants. Each time the model was run (30 times), there was a different outcome. Thus, the overall results of the simulation also are expressed in probabilities (*i.e.*, an *x* percent chance of population extinction). The Carrying Capacity in Table 3 came into play only when random chance made the population larger than allowable by the rules of the model. (In the real world, you could think of this maximum number as being disease or some other factor that would come into play and cause deaths when the habitat was overcrowded.)

The point of Harper *et al.*'s Table 3 is to help the reader understand how Carrying Capacity was set for use in the model. The numbers in Table 3 are not "proven science" provided as "guidance" as was suggested in Item 19 of Dru Associates' November 30, 2012 letter to the Newington Inland Wetland Commission. And, the numbers are not meant to represent a means to calculate "Conservation Area *Needs*" (as was depicted on p. 14 of the Dru Associates July 2011 Herpetological Assessment – italics added).

It is important to realize that Harper *et al.* did not test the validity of numbers in Table 3. **What Harper *et al.* reported upon in their paper is how they made and used a simulation model in order to test the question of "How does losing different proportions of a wood frog or spotted salamander population affect the probability that the population will go extinct in 20 years."** (Refer back to the title of their article.)

Harper *et al*. realized that in the real world, the problem with having development reduce the size of buffer areas around wetlands is not just that habitat is lost, but also that the remaining habitat *quality* is likely to be decreased. In their population model, they simulated reductions in habitat quality by giving individuals reduced probabilities of surviving to reproductive age.

Harper *et al.* modeled habitat connectivity by running the model with a factor that allowed a chance of five extra individuals to be added to the population each year. They found that this had a much larger effect on frog populations than salamander populations. (Frogs breed at a young age, so extra individuals are more likely to live long enough to add to the population.)

The above discussion clarifies how Dru Associates misapplied the model of Harper *et al.* Further, it should be recognized that the comment (August 29, 2012 letter to Newington Inland Wetland Commission) about the journal Conservation Biology not accepting frivolous work is irrelevant to the fact that the numbers from Table 3 in the Harper *et al.* article were used inappropriately when they were taken as guidance for how many amphibians would be expected to be supported by a given amount of habitat in Newington.

In addition, even if it actually had been appropriate to consider Harper et al.'s model rules to be "Conservation Area Needs", Dru Associates' estimate of 0.72 acres of habitat

to support 55 female salamanders in a 100 foot buffer area (pp. 10 and 14 of July 2011 Herpetological Assessment) is based on another misunderstanding of Table 3. As used in Table 3, the word "radius" refers to the distance from the model pool's edge (*i.e.*, the buffer distance). (This is not how mathematicians use the term *radius*.) In calculating the upland habitat area covered by different buffer distances, one would need to visualize the area as a doughnut of upland around a pool. Dru Associates used the formula for a circle which is based on the mathematical definition of the term radius where a radius is the distance from a circle's centerpoint to the edge of the circle. In effect, Dru Associates calculated a doughnut hole by starting in the center of the pool, grossly underestimating the acreage of the 100 foot upland buffer area surrounding the 450 foot diameter pool.

II. Are Soil Depths Limiting to Salamanders on the East Side of Basin 2?

Although the soils are shallow east of Basin 2 (the "heart-shaped pool"), spotted salamanders do not dig deep burrows. In fact, they often use shrew (*Blaurina brevicauda*) burrows which are usually found in the upper 4 inches of soil, rarely as deep as 20 inches. Thus, the soil depths should not be limiting on the east side of Basin 2.

References:

http://www.uri.edu/cels/nrs/paton/LH_spotted_sal.html

http://www.epa.gov/region1/ge/thesite/restofriver/reports/final_era/B%20-%20Focus%20Species%20Profiles/EcoRiskProfile_short-tailed_shrew.pdf

III. Likely Effects of Development on Basin 2 (the heart-shaped pool)

- Blasting, road construction, and house building will destroy much of the upland habitat on the east side of the pool.
- Children and pets are unlikely to respect the signs defining the 100 foot pool buffer.
- Homeowners in an upscale development are likely to have landscaping that involves use of fertilizers and pesticides.
- Unusually intense storm events would likely send polluted water from roads and landscaped yards to the basin regardless of protective practices
- If detention basins hold any water year round, they can provide habitat for bullfrog tadpoles. Bullfrogs are a species that can outcompete other amphibians. Dispersing bullfrogs may come to breed in Basin 2; and, in occasional wet years during which their tadpoles were able to overwinter in Basin 2, they would harm the next year's hatch of wood frogs and spotted salamanders.
- With reduced upland habitat area on the east side and many potential insults to the remaining habitat and the pool itself, it is highly likely that wood frog and spotted salamander populations will decline, or even go extinct in Basin 2.
- Wood frog tadpoles are thought to have a beneficial effect on water quality because they remove algae. Larval spotted salamanders' consumption of other organisms is an important component of nutrient cycling between the pool and the surrounding uplands. Wood frog and spotted salamander population declines or extinctions in the pool would alter the water quality and nutrient cycling in the pool.

IV. Herp Tunnel to Basin 3

Although the herp tunnel sounds like it will get the frogs and salamanders safely under the road to reach Basin 3, this reviewer is not convinced that this is a good idea. The tunnel is not connecting Basin 2 to an area of major habitat importance. For juvenile spotted salamanders and wood frogs attempting to exit Basin 2 on the east side, will this not channel them into a place where there the upland habitat is impaired? *IF* this reviewer correctly understands how this would work, it seems like the risk of routing young dispersing amphibians to a small area surrounded by a wall and houses outweighs any possible value this wetland could have as extra breeding habitat for the amphibian populations of Basin 2.

V. Trade-offs Between Development East of Basin 2 and Acquisition of Basin 2 and the Land to the West

In exchange for permitting development east of the Basin 2 (the large, heart-shaped wetland), the Town will receive ownership of the (more or less) 40 acres that includes the traprock ridge, the long, central headwaters stream and Basin 2, itself. It should be noted that the relationship of these features and the setback distances from traprock and wetlands makes most of the area west of the heart-shaped wetland not likely to be found desirable for development. Thus, the immediate trade-off is not that highly likely future development plans are put to bed, but rather that the right to manage the area is gained by the Town.

With adjacent development to the east, it seems reasonable to believe that Basin 2 will lose functionality as amphibian habitat over time. Thus, its acquisition by the Town should not be viewed as "saving" it.

Gaining the right to manage the area west of Basin 2 would be beneficial in that the Town now owns land immediately to the south; thus, this brings together a larger tract of habitat.

VI. Swamp Cottonwood

Swamp cottonwood (*Populus heterophylla*), a tree species listed as "threatened" in Connecticut, has been reported on the west side of Basin 2. The reported cottonwoods are considered a "substantial" population. Given how few populations have been reported in New England (one of which had but one individual), this population (if species identification is confirmed) would be considered an important population in Connecticut.

In general, seed-producing female swamp cottonwood trees are wind-pollinated with pollen from male trees. The seeds sprout right at the soil's surface. For their roots to take hold initially, they need very moist, bare mineral soil. For the seedlings to survive and grow, they need nearly full sunlight and plenty of available moisture especially in the early part of the growing season. (Available soil moisture means that the roots can extract soil moisture, not necessarily that soil appears to be wet.) Ideal conditions occur on sunny, open sites when high water deposits mineral soil and then begins receding just as the cottonwood seeds are flying through the air or being carried in the water. While

the soil is still very wet, the seedlings sprout. Then, as the water table drops, the fast growing roots are able to get moisture. If the water table remains up (as it may well do in a vernal pool), the conditions will not be good for seedling establishment.

Once established, swamp cottonwood is very tolerant of having wet feet. It also is considered **in**tolerant of shade (though not quite as intolerant as the related Eastern cottonwood). The combination of shade intolerance and a tolerance for wet feet makes it a natural species for swamps where the presence of water keeps many of its competitors from growing. At the same time, in parts of its range it is reported growing on well-drained soil rather than in swamps or other very wet places. According to Robert T. McMaster, in New England, swamp cottonwood "prefers wetlands that are flooded for a few weeks to a few months per year, but saplings and mature trees may tolerate almost constant inundation." (Refer to Robert T. McMaster (2003), "*Populus heterophylla* (Swamp cottonwood) Conservation and Research Plan for New England", published by the New England Wild Flower Society, Framingham, MA under the auspices of the New England Plant Conservation Program [NEPCoP].)

Swamp cottonwood seeds that fall beneath the mother tree are unlikely to grow because it is too shady and, unless bare mineral soil was initially available, the sprouting seeds would not have been able to establish root systems in the first place. Seeds that are carried away from the mother tree are more likely to find good habitat. The seeds may be wind-blown over 100 meters (roughly 330 feet) or carried by water to suitable germination sites.

McMaster notes that in the documented swamp cottonwood populations in New England, there is evidence of vegetative reproduction in all stands, but limited evidence of seedling recruitment. McMaster says that the low number of seedlings may be due to "flooding regime, to competition for sunlight from other trees within the wetland or in the adjacent upland, or to absence of both male and female trees within a population." He also notes that, "Vegetative reproduction through root and stump suckering is common and is probably the primary mode of reproduction for most small populations." In general, large tree stumps produce fewer sprouts than smaller stumps. In swamp cottonwood, stumps less than 12 inches in diameter are likely to produce sprouts.

As a species, swamp cottonwood's strategy for persisting in the larger landscape is not to build up a big population in one place, but rather it creates new subpopulations in different places at the times when soil, moisture, and sunlight conditions all come together in an ideal way for the dispersing seeds to take hold. That way, when one subpopulation gets shaded out, there is another to take its place.

In landscapes such as in New England where there are fewer ideal sites (not to mention excessive deer browsing), swamp cottonwood populations are rare. McMaster considers hydrologic alterations, competition from other woody species, native and non-native, and herbivory to be the most important factors contributing to the risk of extinction of the small populations such as are present in New England (which he reported as ranging from

one to 68 trees). McMaster suggests exclusion of deer and beaver. (Note that deer are a problem for seedlings and sprouts, not large trees.)

Management of swamp cottonwood in Connecticut is difficult because when one subpopulation is at risk, it is not reasonable to assume that there is another one somewhere nearby to take its place. So, it is more important to make sure that the existing populations are not damaged. In addition, McMaster recommends for New England that "although this species is known to be difficult to propagate, efforts at artificial propagation should be continued."

McMaster notes that with climate change, the species may be extending its range northward, and mentions the idea of looking for new populations in the region. Now that it is known that Swamp Cottonwood is in the Newington area, it would be worth looking for it by the long central headwaters stream and elsewhere.

To protect existing swamp cottonwood trees, the most important thing is to make sure that the immediately-adjacent trees are not shading them. Where they are growing in wet areas, they will be shallowly rooted and are subject to being windthrown, particularly where the forest has been opened up in a way that allows winds to rush into the wet area.

VII. Long-term Monitoring

The developer is to be commended for effort in attempting to be ecologically sensitive by incorporating various practices designed to protect the water quality and herpetofauna of Basins 2 and 3. Should development be allowed, it would be worth setting up a long-term monitoring plan of Basins 2 and 3 for water quality, water quantity, herpetofauna populations, and Swamp cottonwood beginning with measurements made before the development and continuing 20 years.

VIII. Landscape Plant Schedule LL-O

Pyrus calleryana is on the State of Connecticut Department of Energy and Environmental Protection's CT Early Detection and Priority Invasive Plants List (dated 3-2-11). It is on the list as an early detection species because it has been found to be invasive in other states. This species is not currently (2012) listed by the Connecticut Invasive Plant Council as Invasive or Potentially Invasive in Connecticut and it is not legally banned as most of the plants on the Council's Invasive and Potentially Invasive plant list are. Nonetheless, the known invasive behavior of *Pyrus calleryana* and its presence on the state Early Detection list suggests that it is not a particularly good species to plant.

Environmental Planting Species

The meaning of "Environmental Planting Species" is not clear. For the record, *Callicarpa americana* is not native in New England. (It is native farther south.) There is some risk in planting *Viburnum dentatum* (an otherwise excellent native wildlife plant) because it is highly susceptible to defoliation by the Viburnum Leaf Beetle which has recently arrived in Connecticut.

Wildlife Resources Review

The revised Newington Open Space Residential Subdivision modifies the original proposal to include 48 building lots and four public streets clustered in the southeast corner of the 73.73-acre site. Approximately 44 acres will be dedicated open space, while approximately 29 acres are to be developed. Creation of a new basin south of the central wetland has been proposed, as has an amphibian crossing to provide a migration passage between two wetlands without requiring road crossings.

The request for an additional environmental review came from the Town of Newington in order to assist decision making regarding the environmental impacts of the proposed development and potential mitigation.

A site walk was conducted on November 28, 2012 and included the forested portion as well as the eastern and central wetlands. The bulk of the property is mature deciduous forest dominated by oaks and maples, with a sparse to moderate understory. There are three wetlands on the property including a north-south running watercourse in the western portion of the property, a large pool in the central portion and a smaller pool in the northeastern portion. The traprock ridgeline is found west of the westernmost wetland and is to remain as open space.

Given the requested submission timeframe, this report will concentrate on impacts to wildlife utilizing or potentially utilizing the wetlands in conjunction with the adjacent uplands. Please see the earlier ERT report for a description of existing wildlife habitat.

The new site plan calls for five lots to be developed adjacent to the eastern edge of the central wetland's buffer and for roadways and houses to be developed adjacent to all but the eastern side of the small eastern wetland's buffer. The proposed amphibian tunnel will cross under Trap Rock Way, allegedly allowing herptile movement between the two wetlands.

Housing lots 28, 29, 30, 31, and 32 are proposed to be built adjacent to the eastern buffer of the central wetland. Robust populations of spotted salamanders and large populations of wood frogs have been reported at this site (Dru Associates, Inc., Herpetological Assessment). Although placards will be installed identifying the area as a wetland buffer, it is highly probable that dumping in the wetland will occur, especially given the topography in that particular area. At a minimum, it can be expected that grass clippings and other lawn debris will accumulate, and, potentially, other garbage will too. Depending on the nature of items placed in the wetlands and the intensity level of dumping, the impacts could be minimal or severe, but the potential exists to compromise this currently productive wetland's wildlife habitat value.

The small eastern wetland is proposed to have housing lots adjacent to its northern buffer and roadways adjacent to its western and southern buffers, with a proposed amphibian tunnel connecting it to the larger central wetland, allowing passage between the two wetlands. Spotted salamander egg masses have been reported for this pond (Dru

Associates, Inc., Herpetological Assessment). What remains unclear is in regards to movement away from this small eastern wetland; for both adults post-breeding as well as juvenile dispersal into the uplands. It is unclear how amphibians, particularly juveniles, will be kept from attempting to disperse in directions other than toward the tunnel, only to find roadways, resulting in higher mortality, compounding the increased mortality that may occur during dispersal from the central wetland for those juveniles that attempt to travel east and north.

While the Mitigation Plan provided by Dru Associates, Inc. provides a detailed plan for creating a new basin located south of the central wetland, it should be considered that there is no guarantee that a functional wetland can be successfully created.

As stated in the first report, it should be noted again that development in the upland will result in outright habitat loss, affecting and changing the species composition of the upland area as lawn and pavement will replace the trees and shrubs that now serve as sources of food, cover and shelter. Bird species that use forested wetlands at varying times of the year for breeding, feeding and shelter include northern water thrush, common yellowthroat and eastern phoebe. As the amount of available habitat shrinks, it is likely that populations of these species will decrease, while more common suburban species such as blue jay, American robin and American crow can be expected to increase. This site contains a large amount of intact acreage in a highly developed part of the state, providing some of the only habitat of significant size in the immediate surroundings, which is critical Additionally, it is adjacent to and functions in conjunction with traprock ridge habitat, which is considered one of the 12 key habitats in Connecticut's Comprehensive Wildlife Conservation Strategy and is important habitat for many reptile and amphibian species and species of Greatest Conservation Need.

Currently, housing lots are planned for the eastern portion of the property. With the increased development in this area, the value of the entire site for wildlife will decrease. Again, the only way to maintain the quality of the available habitat is to leave the property undeveloped. While any type of development will diminish the value of the habitat for wildlife, changes in the layout and number of housing units can reduce these impacts. Lots 31 through 48 should remain undeveloped, allowing the wetlands to retain their functionality and productivity, decreasing the likelihood of dumping, and maintaining a larger portion of the property as wildlife habitat rather than suburban housing and lawn.

References

Connecticut Department of Energy and Environmental Protection. Connecticut's Comprehensive Wildlife Conservation Strategy. 2005. Connecticut Department of Energy and Environmental Protection, Wildlife Division, Bureau of Natural Resources, Hartford, CT.

Dru Associates, Inc. July, 2011. Herpetological Assessment. Glen Cove, New York.

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the project area have been reviewed. According to our records, multiple State-listed species (RCSA Sec. 26-306) have been documented on or near the site proposed for the Newington Walk development.

State-Listed Plant Species

Swamp cottonwood (*Populus heterophylla*), a State Threatened plant species, was recently documented at the parcel on Russell Road in Newington, CT.

Robert H. Mohlenbrock. USDA NRCS. 1995. *Northeast wetland flora: Field office guide to plant species*. Northeast National Technical Center, Chester. Courtesy of USDA NRCS Wetland Science Institute. Usage Requirements.

Swamp cottonwood is native to the eastern United States but is described in the *Silvics of North America* as "sparse throughout its range."* The species is relatively short-lived (trees seldom remain sound after 80 years) and is considered an obligate wetland species.

Populations in New England occur in a variety of wetland settings, though several have been observed in small wetlands perched on traprock ridges. Overall, Swamp cottonwood prefers wetlands that are flooded for a few weeks to a few months per year.** This seasonal flooding likely benefits cottonwood by reducing the density of competing vegetation.

Although mature Swamp cottonwood trees can tolerate constant inundation, seasonal water fluctuations are likely critical to the regeneration and long-term survival of the species. In order for its seeds to germinate and become established, an exposed and saturated substrate must be present soon after the seeds fall to the ground. Because the seeds have little or no endosperm, they are only viable for 1-2 weeks.**

Given its reliance on seasonal water fluctuations, Swamp cottonwood may be negatively impacted by changes in the frequency, duration, depth, and/or timing of flooding.

Proposed changes to the site on Russell Road may impact the hydrology of the wetland where Swamp cottonwood has been documented. In the Hydrologic Impact Assessment Report submitted by Legette, Brashears & Graham, Inc., it was acknowledged that the detention/infiltration basin proposed north of the wetland will:

> "…capture runoff during and after storm events, and will allow some of the captured runoff to flow down-gradient to the wetland area, offering the potential to slightly increase the duration of wet conditions in the wetland area."

As noted above, an increase in the duration or frequency of flooding could negatively impact the population of Swamp cottonwood.

Of additional concern is the possible nutrient loading of the wetland. Runoff from fertilized lawns and gardens located uphill would likely transport nitrogen and other nutrients into the wetland despite the proposed buffer. Although these nutrients are not expected to impact the Swamp cottonwood directly, they could promote the growth of more competitive species such as Red maple (*Acer rubrum*), leading to the eventual exclusion of Swamp cottonwood from the wetland.

For more information regarding State-listed plant species, please contact Nelson DeBarros (nelson.debarros@ct.gov).

State- Listed Wildlife

In response to your request for a Natural Diversity Data Base (NDDB) Review of State Listed Species for Newington Walk, our records indicate the following extent population of species occurs within the vicinity of the site:

Peregrine falcon (*Falco peregrinus)* - State listed threatened species

Though somewhat tolerable of human disturbance, the Peregrine falcon will be negatively affected if work occurs during their nesting season. If this species is present on the site, the DEEP Wildlife Division recommends that the work be done during the non-nesting season (June – March).

For more information regarding the Peregrine Falcon see the attached Fact Sheet or please contact Elaine Hinsch (elaine.hinsch@ct.gov).

Natural Diversity Data Base information includes all information regarding critical biologic resources available to us at the time of the request. This information is a compilation of data collected over the years by the CT Department of Energy & Environmental Protection, Bureau of Natural Resources and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site specific field investigations. Consultations with the Data Base should not be substituted for on-site surveys required for

environmental assessments. 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 Data Base as it becomes available. If the proposed work has not been initiated within 12 months of this review, contact the NDDB for an updated review.

Please contact (nelson.debarros@ct.gov; 860-424-3585) if you have any questions. Thank you for consulting the Natural Diversity Data Base and continuing to work with us to protect State-listed species.

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*Burns, Russell M. and Barbara H. Honkala, tech. coords. Silvics of North America, vol 2. Hardwoods; Populus heterophylla. Agriculture handbook no.654. Washington, D.C.: U.S. Dept. of Agriculture, Forest Service, 1990. p.551-554.

**McMaster, Robert. Conservation and Research Plan for New England: Populus heterophylla L. (Swamp cottonwood). The New England Wildflower Society, 2003. p.i.

WILDLIFE IN CONNECTICUT

STATE THREATENED SPECIES

Peregrine Falcon

Falco peregrinus

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Background

The peregrine falcon was a regular nester in Connecticut from the 1860s through the early 1900s. Prior to the Migratory Bird Treaty Act of 1918 and the strengthening of collection regulations, hundreds of peregrine eggs and many adult specimens were collected in Connecticut and Massachusetts. Some live birds and eggs were collected for use in falconry. Many more eggs and specimens were added to private collections as part of a popular late 19th century hobby. Peregrine nesting activity in Connecticut declined through the 1920s and 1930s, and the last documented nesting occurred on the Travelers Tower in Hartford in the late 1940s. Peregrines remained absent from Connecticut until 1997 when a pair successfully nested once again on the Travelers Tower. The peregrine falcon was listed in 1992 as an endangered species on Connecticut's Endangered Species List. It was reclassified as a threatened species in 2010.

Peregrine falcon populations declined rapidly between 1950 and 1965 throughout the United States and parts of Europe. By 1975, the entire population of peregrines in the eastern United States was considered to be extirpated (disappeared from that region). This decline is directly attributed to the effect of organochlorine pesticides, such as DDT, on breeding populations. The speed and global scale of this species' decline makes it one of the most remarkable events in recent environmental history.

Due to the population crash, the peregrine falcon was declared a federally endangered species, and extensive efforts were made to reestablish birds in the eastern United States. Successful reintroduction programs, using captive-bred birds, helped restore small breeding populations along the East Coast. The Peregrine Fund, a non-profit organization dedicated to restoring peregrine populations, conducted the large captive breeding program. The reestablishment effort, coupled with restrictions placed on the use of organochlorine pesticides in the United States (DDT was banned in 1972), resulted in the recovery of the peregrine falcon population. The peregrine was removed from the federal endangered species list in 1999.

While Connecticut did not participate in any reintroduction programs, the state benefited from our neighboring states' efforts. In 1997, a peregrine pair successfully produced 3 chicks on the Travelers Tower. Leg bands revealed that the female of the pair had come from a 1994 reintroduction project in Greece, New York, sponsored by Rochester Gas & Electric, in cooperation with the New York Department of Environmental Conservation. In the years since peregrine falcons began nesting again in Connecticut, additional pairs have successfully produced young at locations in several towns. Every year, a number of dedicated volunteers and Wildlife Division staff monitor the nests throughout the nesting and fledging seasons. Division biologists also attempt to visit the nests (if they are accessible) to place identifying

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leg bands on the young before they fledge. This is an important management tool for monitoring this state threatened species.

Description

The peregrine falcon is a long-winged, medium-sized bird of prey. Adults have long, pointed wings and a long, rounded tail with narrow, black bands ending with a broad, dark band tipped with white. The barred upper parts are blue-gray, while the underparts are white to light buff and cross-barred with brown. The black crown and nape extend to the cheeks, forming a distinct black helmet. The feet are yellow.

Immature peregrines are similar, but the back and underparts are brown and the throat is heavily streaked with brown. Both adult and immature peregrines have a bold, dark, vertical whisker-like mark (mustache mark) on the sides of the head.

Range

The peregrine falcon is one of the most widespread birds in the world. It is found on all continents except Antarctica, and on many oceanic islands. Although widely distributed, the peregrine is common in only a few places.

Habitat and Diet

A wide variety of habitats are used by peregrine falcons. The birds are found in open country, such as coastal lowlands, as well as along rivers and in urban locations.

Pigeons, waterfowl, crows, jays, starlings, shorebirds, and other medium to small birds are the main prey items of the peregrine. In urban areas, pigeons and starlings comprise most of the diet. Beetles, dragonflies, and migrating monarch butterflies are eaten occasionally.

Life History

Nest sites, known as eyries, are located above an open area so the falcons can launch their aerodynamic hunts. The nest is a hollow, unlined scrape on a cliff, ledge, or rocky outcrop. Abandoned raven or hawk nests in similarly high locations are occasionally used. The most publicized nesting areas have been on roofs and ledges of city buildings. Pairs may use the same nest site for many years. Male peregrines arrive at the nest site first and go through a series of aerial displays to attract the females to the site. Territories are usually reestablished by late March.

Three to 4 cream or buff-colored eggs, covered with red-brown markings, are laid in late April and May at intervals of 2 to 3 days. Incubation, primarily done by the female, begins with the second or third egg and lasts 28 to 29 days for each egg. The hatchlings are closely brooded by the female for the first 14 days. The male typically brings food for all to the nest and the female feeds the young. The young begin flying at 35 to 42 days but remain dependent on the adults for another 2 months.

Peregrine falcons reach sexual maturity at age 3, and they may reach 17-20 years of age.

Interesting Facts

The peregrine falcon is probably best known for its spectacular method of capturing prey in mid-air. It flies faster than most other birds and, when hunting, it increases its speed by making aerial dives with the wings partially or fully pulled in. The peregrine plunges at speeds up to 175 miles per hour (mph) to attack its prey, which is killed instantly. This hunting dive is called a "stoop." Normal flight speed can range between 28 to 60 mph.

Because of its habit of preying on waterfowl, the peregrine falcon has historically been referred to as the duck hawk.

Peregrines can be preyed upon by great horned owls, gyrfalcons, and other peregrines.

Peregrine falcons have adapted to living in cities. Cities offer tall buildings with ledges for nesting, water sources, large populations of pigeons and starlings for food, and have few natural predators.

The scientific name comes from the Latin words *falco*, meaning hook-shaped, possibly referring to the beak or claws, and *peregrinus*, meaning to wander.

As part of the reintroduction effort, The Peregrine Fund released more than 4,000 captive-reared peregrines in 28 states over a 25-year period.

What You Can Do

Respect locations of peregrine nest sites and do not disturb nesting birds.

North American peregrine falcon populations continue to be threatened by the use of DDT in the tropics where some spend the winter. Support for the advancement of alternative methods of pest control in developing nations will help not only the peregrine, but ospreys and countless species of songbirds that nest in the United States and Canada and winter in Central and South America.

State of Connecticut
Department of Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division
www.ct.gov/deep/wildlife

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3/2012

About the Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, soil specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area — an 86 town region.*

The services of the Team are available as a public service at no cost to Connecticut towns with funding provided by the CT DEEP.

Purpose of the Team

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, landfills, commercial and industrial developments, sand and gravel excavations, active adult, recreation/open space projects, watershed studies and resource inventories.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

Requesting a Review

Environmental reviews may be requested by the chief elected official of a municipality and/or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the chairman of your local Conservation District and the ERT Coordinator. A request form should be completely filled out and should include the required materials. When this request is reviewed by the local Conservation District and approved by the ERT Subcommittee, the Team will undertake the review on a priority basis.

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438, e-mail: connecticutert@aol.com.

About the Eastern Connecticut RC&D Area

Resource Conservation and Development (RC&D) is a program of the United States Department of Agriculture (USDA). The Secretary of Agriculture gave the Natural Resources Conservation Service (NRCS) [formerly the Soil Conservation Service] responsibility for administering the program. RC&D is unique because it is led by local volunteer councils that help people care for and protect their natural resources in a way that improves the local economy, environment, and living standards. RC&D is a way for people to work together to plan and carry out activities that will make their area a better place in which to live.

Interest in creating the Eastern Connecticut RC&D Area first started in 1965. An application for assistance was prepared and submitted in June 1967 to the Secretary of Agriculture for planning authorization. This authorization was received in August 1968. In 1983, an application by the Eastern Connecticut RC&D's Executive Council was approved by USDA and NRCS to enlarge the area to an 86 town region.

The focus of the Eastern Connecticut RC&D Program is to help people care for and protect their natural resources, improve local economies, and sustain a high quality of life. The program derives its success from its ability to connect individuals, communities, government entities, and grassroots organizations. These connections and partnerships enable the development of shared visions and resource networks that work toward a healthy future for Connecticut. Current members on the RC&D Council represent the Working Lands Alliance, the Essex Land Trust, The Last Green Valley, the Green Valley Institute, the Thames River Basin Partnership, WINCOG, SECCCOG, NECCOG, CRERPA, NorthCentral Conservation District, Eastern Conservation District and the CT River and Estuary Conservation District. For more information please visit their website at: www.easternrcd-ct.org.