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Salmon River Watershed Municipal Land Use Evaluation Project

Draft Assessment Report

June 26, 2009



Submitted to:
The Nature Conservancy
Lower Connecticut River Program
45 Main Street
Essex, CT 06426

Submitted by:
Horsley Witten Group, Inc.

The Nature Conservancy
Salmon River Watershed First Draft Assessment Report
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1.0 INTRODUCTION

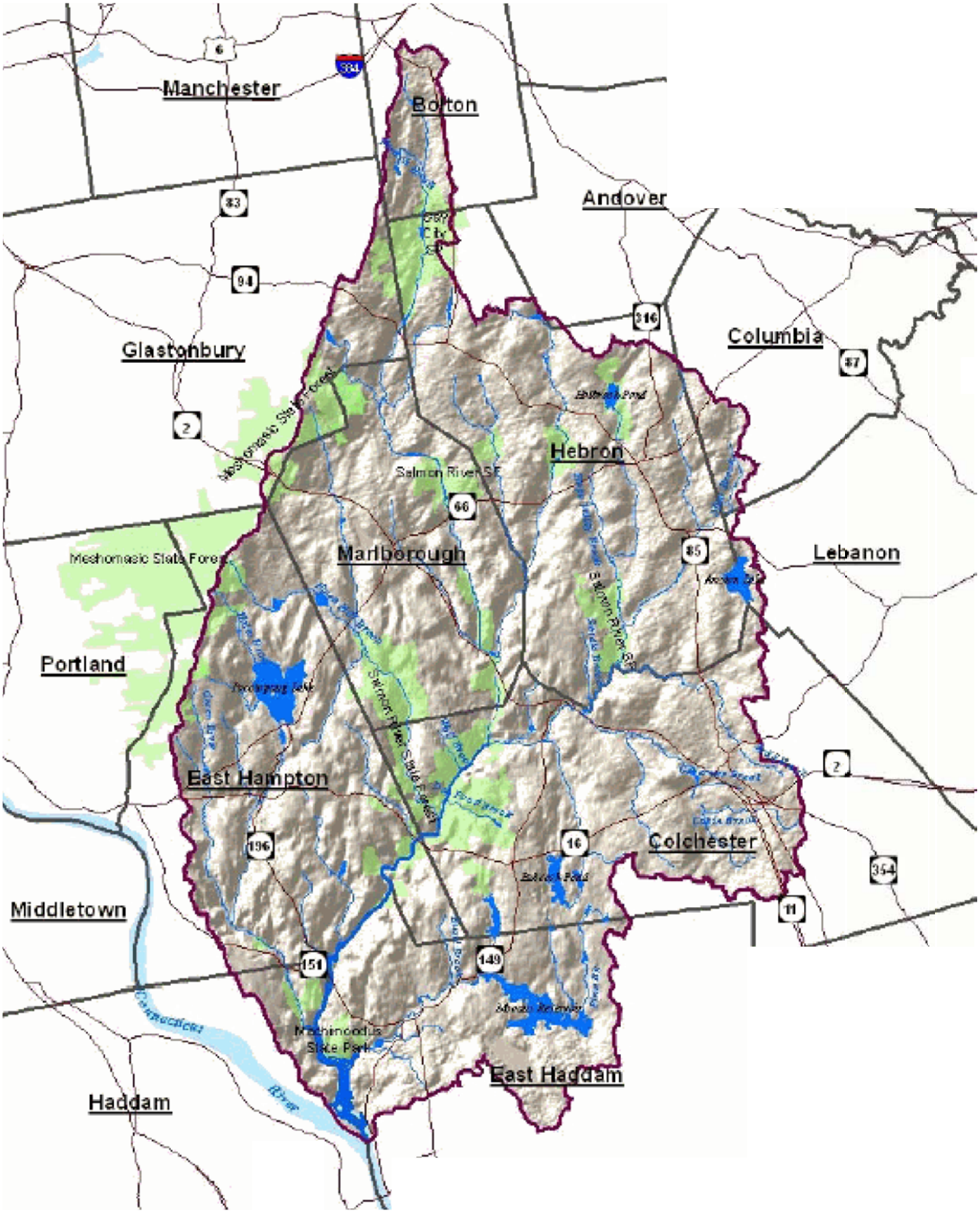
Background

The Salmon River Watershed (SRW) encompasses an area of approximately 150 square miles and drains a surface water basin that includes all or part of ten Connecticut municipalities (Figure 1). The Salmon River is home to a wide diversity of fish, macro-invertebrates, and high-quality cool- and cold-water stream habitat, making it one of the State's most viable trout streams. Like many cool- and cold-water streams and rivers in the eastern United States, the resource is extremely sensitive to the impacts of urbanization, particularly to development activities that contribute to increases in-stream water temperatures and/or pollutant loading to the aquatic environment.

It is well established that the cumulative amount of impervious cover can be a robust indicator or measure of adverse impacts to aquatic and terrestrial ecosystems through various mechanisms, including the direct impact of converting natural habitat to pavement and buildings, and indirect impacts such as altering groundwater and surface water hydrology & chemistry. These hydrologic and chemical alterations lead to facilitating the accumulation and transport of pollutants, and decreasing aquatic community diversity, among other measurable effects (Center for Watershed Protection (CWP), 2003, Calhoun and Klemens 2002, Carter 1996, Coles, et al., 2004, National Research Council 2008, Schiff and Benoit 2007, Schueler 1987, Skidds, et al., 2007). The Nature Conservancy (TNC) has recently completed preliminary analyses for impervious cover within the watershed to help identify potential impairments today and into the future at full development buildout (Figures 2 and 3). A summary of TNC's buildout analysis methods is provided in Appendix A of this report. Threats from development are particularly urgent at this point for the Salmon River as the watershed is located within one of the fastest growing areas in the State. It is therefore a high priority for TNC and other stakeholders to evaluate the potential sources of impact and strengthen management strategies to protect this sensitive resource.

In January 2007, TNC launched the Salmon River Watershed Partnership (SRWP) as a collaborative and integrated approach to managing the watershed. As a resource which includes land within 10 municipalities, the SRWP looks to employ regional tools for engaging municipalities in the watershed and improving their capacity to protect the River. The first action taken by the SRWP was the development of a Conservation Action Plan through a series of regional stakeholder workshops. Chief elected officials subsequently voted to support the plan in January 2008 and have contributed financial and human resources to the project since the development of that report. In May 2008, the watershed communities signed the Salmon River Conservation Compact, recognizing the importance of the River and committing each signatory community to the implementation of a regional stewardship program.

In February 2009, TNC retained the services of the Horsley Witten Group, Inc. (HW) to perform the next critical component of this initiative within the watershed: the Salmon



Legend

- Salmon Watershed
- Salmon River
- Other Streams
- Conservation Ownership
- Roads

**Image Source: The Nature Conservancy*

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Salmon River Watershed Locus Map

6/24/09 ec
R:\8126 TNC-Salmon River\GIS

Figure 1

CURRENT AVG: 5.6

SUB-BASINS

Percentage of Impervious Surface

- 0.89 - 2.00
- 2.01 - 4.00
- 4.01 - 6.00
- 6.01 - 8.00
- 8.01 - 10.00
- 10.01 - 12.00
- 12.01 - 15.00
- 15.01 - 20.00
- 20.01 - 22.67

617673

BUILDOUT AVG: 6.7

*Image Source: The Nature Conservancy

Calculated using ISAT Tool from NOAA/NEMO.
Calculation based on the 2000 Census population density.
Landcover: CLEAR/UCONN 2002 Landcover
Current landcover changed to reflect 1/4 Acre developed area around every current home as developed by J. Parent & K. Geisler.
For the build out, landcover changed to reflect 1/4 Acre developed area around every new home as developed by the build out.
Commercial/Industrial zones assumed to be developed at build-out.
Build Out calculated using the UVM Community Build Out Tool.

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Salmon River Watershed Sub-Basin Buildout Analysis

Figure 2

6/24/09 ec
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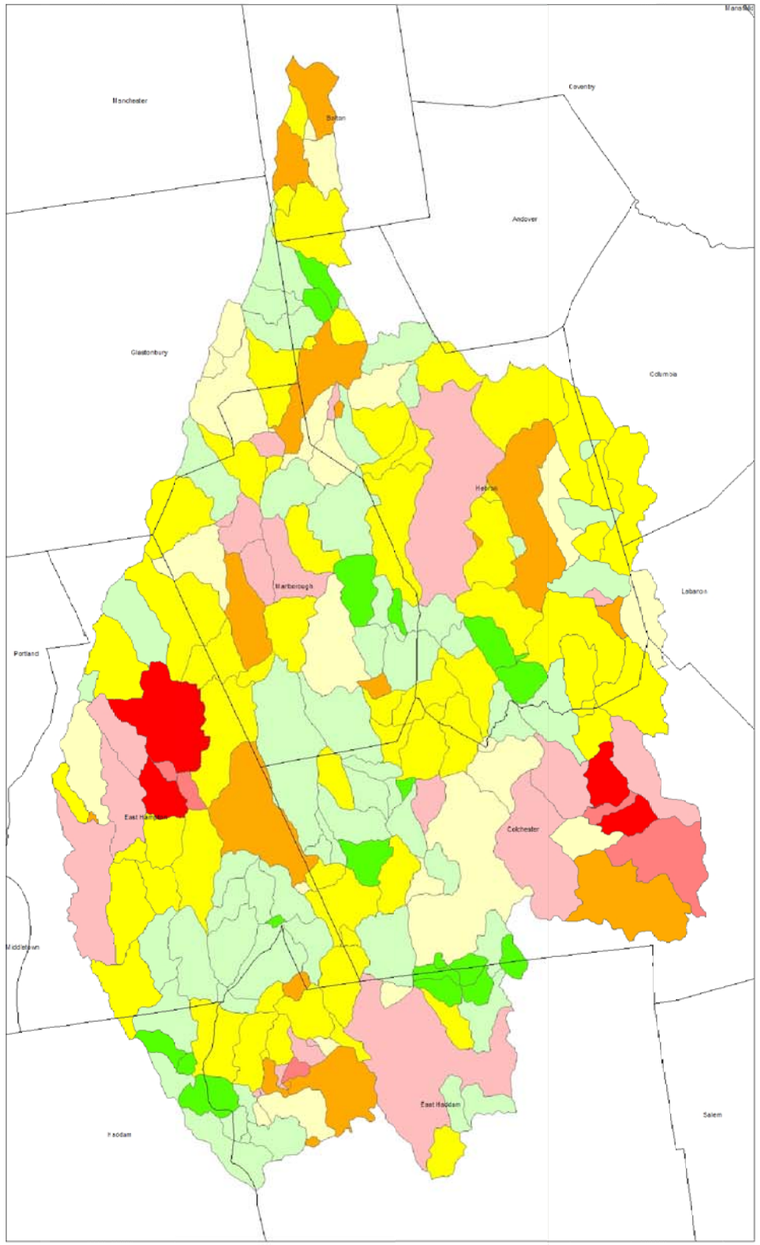
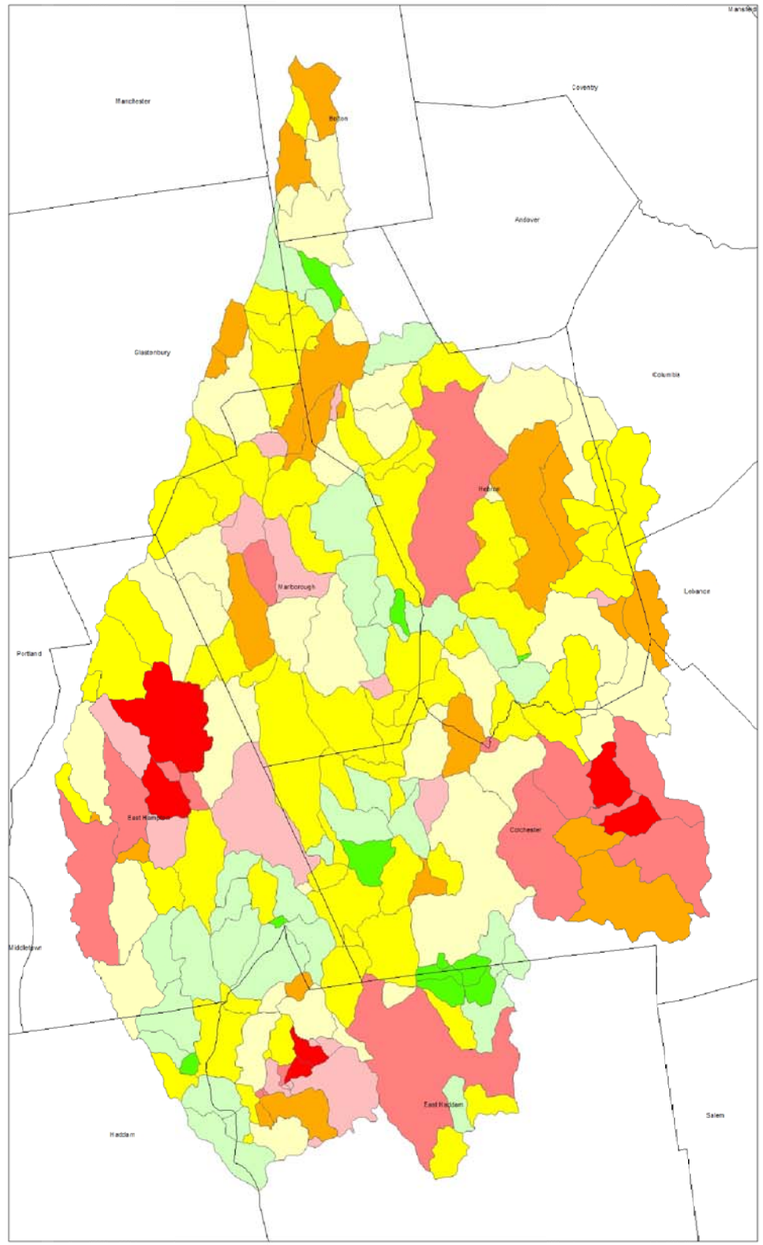
CURRENT AVG: 5.8



BUILDOUT AVG: 6.9



Percentage of Impervious Surface

- TOWNS
- 0.89 - 2.00
- 2.01 - 4.00
- 4.01 - 6.00
- 6.01 - 8.00
- 8.01 - 10.00
- 10.01 - 12.00
- 12.01 - 15.00
- 15.01 - 20.00
  6.17673
- 20.01 - 22.67

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Salmon River Watershed Basin Buildout Analysis

Figure 3

6/24/09 ec
R:\8126 TNC-Salmon River\GIS

**Image Source: The Nature Conservancy*

Calculated using ISAT Tool from NOAA/NEMO.
Calculation based on the 2000 Census population density.
Landcover: CLEAR/UCONN 2002 Landcover
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River Watershed Municipal Land Use Evaluation Project. This document represents the culmination of the first phase of this project and initiates the process of developing recommendations for revising municipal codes and management practices/policies that would be more protective of watershed health and cool- and cold-water stream habitat in particular.

Project Scope and Framework

The principal purpose of this project is to evaluate the municipal land use policies and practices within each of the nine participating SRW communities: Bolton, Colchester, Columbia, East Haddam, East Hampton, Glastonbury, Haddam, Hebron, and Marlborough. Lebanon, the tenth watershed community, contains an extremely small fraction of the watershed relative to the other nine communities and did not participate in the study (Figure 1). HW's evaluations focused on identifying current resource protection tools and preparing watershed-wide and town-specific recommendations to ensure better protection in the future. To achieve this objective, it is critical to understand the role that local regulations can play in protecting—or not protecting—a sensitive aquatic water resource such as the Salmon River. Our recommendations are guided by series of "resource oriented" goals that seek to address the issues of direct impacts on wetlands and watercourses as well as the broad municipal policies that dictate the general patterns of development that affect water resource quality. The overarching project goal was to provide information to the participating municipalities on tools and practices that would accomplish the following:

- Limit the impacts of land development projects near wetland and watercourse edges;
- Increase conservation areas throughout the watershed through innovative land use management practices;
- Manage and mitigate impacts from impervious surfaces within existing and new development; and
- Improve municipal operation and maintenance practices that impact surface water runoff quality.

These project goals served to guide the overall assessment process including helping to direct future outreach and fulfill the content of interim and final reports.

Approach

The project approach was designed as an iterative process to incorporate input from local municipal officials of the SRW communities in order to draft recommendations that address the most critical issues facing the watershed. To this end, the process allowed municipal officials and stakeholders to provide input at multiple points in the process to ensure that project recommendations are focused on the right issues and that assessments of local conditions are accurate. One-on-one interaction with municipal officials will continue through subsequent phases of the project leading up to the final report and watershed summit.

The first step of this project was to conduct Preliminary Municipal Audits of existing municipal policies, regulations, and practices that impact surface water conditions. The Preliminary Municipal Audits covered an extensive range of information in each town and focused on the following documents: Zoning Regulations, Subdivision Regulations, Inland Wetland and Watercourse Regulations, and Plans of Conservation and Development. The objective of the audits was to identify the connections between local regulations and the overarching project goals. The audits served an important role in comparing the different regulatory approaches among the different municipalities throughout the watershed and helped to lay the groundwork for more detailed discussions with local officials as the process moved forward. The Preliminary Municipal Audits for each of the nine participating SRW communities can be found in Appendix B of this report.

The next phase of the project involved meeting with municipal officials from the participating SRW communities. These meetings provided an opportunity to discuss the initial findings of the Preliminary Audits and to hear from municipal officials regarding the issues that they perceived to be the most critical related to watershed protection. What emerged from these meetings was that there were a series of priority issues that link directly with specific regulatory areas that if implemented across the watershed will result in more effective water resource protection. The critical regulatory issues and/or management tools that emerged from these discussions include:

- Conservation Subdivision Development;
- Roadway Design Requirements;
- Wetland / Watercourse Buffers and Associated Regulations;
- Stormwater Management;
- Forestry Regulations;
- Development Review Capacity;
- Land Clearing Provisions; and
- Parking Regulations.

The critical issues were presented and discussed at the SRW Steering Committee on April 22, 2009 and there was a general consensus that these topics represented the core of what was needed to be addressed to help ensure sustainable cool- and cold-water stream habitat within the Salmon River watershed. HW used these critical issues to frame the regulatory areas as the basis for our recommendations. As the project moves forward, the next steps will include soliciting feedback from the Steering Committee and municipal officials on the recommendations and a hosting Watershed Summit meeting in the Fall of 2009.

2.0 FINDINGS AND RECOMMENDATIONS

The following sections summarize the findings for each town relative the critical issues/tools identified by HW and the Steering Committee. These recommendations should be viewed as guidelines for each municipality and to provide a foundation for future local regulatory code revisions. In many cases, a close approximation of a recommended policy or practice already exists in one or more of the SRW communities. This demonstrates that some municipalities can build upon their existing regulations, while others, which have yet to consider a particular technique, have a nearby example to consider when making regulatory changes. It is important to note that any proposed regulatory amendment should be carefully considered with input gathered from all affected municipal agencies as well as the community at large. Regulatory tools or standards proposed in this report should be vetted with individuals well-versed in Connecticut land use law to ensure that effective and defensible language is used during the adoption process.

Conservation Subdivision Development

Conservation Subdivision Development (CSD), know by many other names (e.g. Conservation Design, Cluster Subdivisions, Open Space Residential Design), is an approach to residential development that promotes open space preservation based on a range of resource protection priorities. It provides added flexibility within development standards to promote innovative housing and infrastructure designs while minimizing disturbance to the natural features on the land. The basic process of CSD is to first determine how many lots could be developed on a given tract of land using a conventional subdivision approach. This is often referred to as the "site yield." Once that yield is determined, the design process proceeds to first identify all of the areas on the land that require protection, make development challenging or provide potential amenities to future residents. Stream corridors, wetlands, floodplains or contiguous tracts of forest, for example, represent natural areas that should be preserved to the greatest extent possible. Poorly drained soils or exposed ledge represent areas that would make development difficult adding costly cut and fill operations to construction and severely disrupting existing drainage patterns in the process. Finally, scenic vistas or existing trails represent potential amenities that can add property and quality-of-life value for the future residents.

Once these areas are identified and mapped, the designer then configures the allowable number of homes in a manner that minimizes impacts to the site. Reductions in minimum lot size, reduced building setbacks and other relief mechanisms are provided in the Zoning Regulations to provide site design flexibility. Generally, a minimum amount of preserved open space is required in the regulations as a baseline for compliance. The process of designing and permitting a CSD may be more involved then a typical subdivision, however the resulting development can be much more sensitive to the natural ecological and hydrological systems on the land and limit the impacts to sensitive

resources. The core regulatory elements and policy decisions that must be addressed by any community looking to effectively implement CSD include:

- Optional vs. required design by an applicant;
- Applicability (e.g., minimum parcel size, minimum number of lots);
- Minimum open space requirements;
- Density incentives;
- Establishing yield and CSD design process;
- Design flexibility; and
- Dedication and management of open space.

As outlined in greater detail within Table 1 on the following page, some form of CSD is employed by all of the nine participating watershed communities. However, the manner in which key elements are handled varies considerably from one community to another.

Optional vs. required design by an applicant:

Of the nine watershed communities, three require at least some level of CSD design in certain subdivision applications. The remaining six municipalities that allow CSD do so through a voluntary application process. The use of voluntary implementation of CSD can result in lower levels of use as developers may not realize the incentives "built in" to CSD in the form of lower infrastructure costs. Making the CSD design process mandatory in the permitting of local residential subdivisions is widely considered a much more effective way to achieve implementation of environmentally sensitive projects, but municipalities must take care to draft these regulations in a way that is legally defensible and not ruled as an unfair burden or loss of property rights to a perspective applicant.

Assuming mandatory CSD design remains legally unchallenged in Connecticut, it is recommended that communities mandate CSD design and require developers to at least show the potential outcome on the property through this approach. This holds the developer to a higher standard when preparing subdivision plans and increases options from the municipal perspective. A CSD should not require a cumbersome permitting procedure, but instead, foster a partnership between the municipality and the developer to preserve existing green spaces and natural resources via an equitable, viable process that makes this style of development more attractive to the developer while meeting specific goals of the community. Requiring a CSD through a special permit or special exception is not necessarily prohibitive, however the municipality should consider how the special permit/exception process could be designed to reduce permitting time, effort, and risk from the developer's perspective. Within this process, municipal officials should seek to provide timely information and guidance to applicants from the outset through the use of a pre-application meeting. For more detailed information on pre-application meetings, refer to the Development Review Capacity section of this report. Additionally, density bonuses can also be used to offset the perceived burden of a special exception and are discussed further below.

Table 1. SRW Community Comparison-Conservation Subdivision Development

Watershed Towns	Bolton	Colchester	Columbia	East Haddam	East Hampton	Glastonbury	Haddam	Hebron	Marlborough
Name	Open Space Conservation Development	Residential Development Flexibility for Open Space	Cluster Design	Conservation Subdivision	Conservation Subdivision	Open Space Subdivision	Conservation Subdivision	Open Space Subdivision	Open Space Conservation Area Regulation
Required or Optional	Optional	Optional	Optional	Required	Required	Optional	Required over 5 lots	Required	Optional
Permit Requirement	Planning Commission approval. Special Permit for multi-family.	Special Exception	Special Permit	Planning Commission approval and Special Exception	Special Permit	Planning Commission approval	Special Permit	Special Permit	Planning Commission approval
Applicability	10 or more acres	Any subdivision	25 or more acres	20 or more acres OR 5 or more lots	25 acres or more AND 5 or more lots	Any subdivision	Any subdivision	5 acres of more if in sewer district. Otherwise 10 areas or more	5 or more lots
Open Space Required	Standard: 20% Conservation: 40%	Standard: 10% Conservation: At least 15%	Not specified	Standard: 15% Conservation: determined by lot reductions- typically 50% in practice.	Standard: 15% Conservation: 40%	Equal to the area of land gained by reduced lot dimensions.	Standard: 20-25% Conservation: 45-55%	Standard: 20% Conservation: 30%	Not specified
Density Incentives	Unclear- formula driven density calculation.	Density may be increased through increasing open space	No	No	No	No	Density may be increased by dedicating open space for public access such as providing public trails, active recreation, etc.	Density may exceed underlying zoning by up to 20% as calculated by buildable area formula and with inclusion of affordable housing.	No
Net Buildable Area Considerations	Yes	Yes	Yes- Use of yield plan	Yes- Use of 4 step process	Yes- Use of 4 step process	No- but recommended in POCD	Yes- Use of yield plan	Yes- Use of formula	Yes- Use of yield plan
Design Flexibility Allowances	Reduce lot size by up to 40%, decrease setbacks by 15%.	Reduction of up to 33% for: lot size, minimum contiguous buildable area, one side of buildable square, and lot frontage. Undefined flexibility for lot coverage and setbacks.	Reductions in lot and bulk requirements shall not exceed 20%.	Reduce lot size by up to 70%, increase in lot coverage by 100%, decrease in setbacks by 25%.	Reduced lot size, increase in lot coverage by 100%, decrease in setbacks by 40%, reduced cul-de-sac widths by 25% if serving no more than 5 lots.	Lot size and setback requirement shall be reduced to next higher density residential zone (20-50% reductions)	Reduce lot size by up to 70%, increase in lot coverage by 200%, decrease in setbacks by up to 50%.	Various reductions to lot size and setbacks depending on underlying zoning.	Reduction of up to 50% of minimum lot size and front setback. Increase in lot coverage by 25%.
Management of Open Space Enforceable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes- can also pay a fee-in-lieu of providing open space	Not specified

Applicability:

Assigning a specific applicability threshold (e.g., minimum parcel size) for a CSD is an important consideration for determining which development proposals should be eligible to use this innovative process. There are a range of applicability thresholds within the SRW communities from values as high as 25 or more acres to communities that have no minimum threshold. It is recommended that communities seek to increase eligibility for CSD design by decreasing the applicability thresholds as much as possible. However, it is important that communities are comfortable enough with their CSD regulations that the added review of smaller subdivisions will not excessively burden development review capacity and that the reviewing agencies are comfortable with how the design flexibility standards will operate at a smaller scale. Communities should carefully consider how their CSD applicability threshold will impact their ability to oversee the management of small open space parcels. This can be a significant issue for communities with limited administrative capacity that may not want to oversee a large number of small open space parcels dispersed across the landscape.

Minimum open space requirements:

There are a wide range of CSD open space requirements within the nine municipalities, varying from 15% to 50% (Table 1). The recommendation herein is not necessarily to determine one number that communities should target, but instead to provide guidance on what is reasonable to expect based on other requirements in the regulation. Simply put, the amount of open space that can be reasonably required is directly related to other standards that consume land in the site design process. For example, if the minimum lot size is reduced by a small or modest fraction of the lot size associated with a conventional subdivision, then the municipality cannot reasonably expect to receive high percentages of open space. However, where local regulations have dropped minimum lot sizes from the one acre range to the 10,000 square feet range, these communities have been able to require significant amounts of open space. Similarly, where residential street right of way and cul-de-sac standards are excessively large, open space areas can be limited. Communities that reduce minimum lot sizes to truly "compact" levels and also look to reduce roadway widths can very reasonably require open space set asides of at least 50%.

Additionally, municipalities should consider the potential uses for open space and link these uses to community goals. In an environmentally sensitive region such as the SRW, it is best to encourage open space requirements that truly preserve natural open space, such as forest preserves, passive recreation, and similar activities. Communities should seek to include language that supports their specific goals for resource protection such as open space that provides extended buffers from wetlands and streams. Each of the SRW communities should carefully consider how they can add specific language to their CSD open space regulations to further protect sensitive water resources. In general, active recreation such as playgrounds and ball fields should receive a lower priority for meeting open space goals as these areas may be more appropriate for the "buildable area."

Density incentives:

Density incentives can take on a wide range of values but should always be linked to community goals. For developments near town centers, urbanized areas, or other areas with close access to services, the community may want to promote affordable housing as a viable goal for a CSD density incentive. For developments in rural areas or near sensitive natural resources, the community should shift the density incentive to reward resource preservation. This can be a delicate balance as the goal of density incentives is to provide enough motivation to promote CSDs over traditional subdivisions, but not overburden a site with development. It is often wise to consult the local Plan of Conservation and Development to determine how potential CSD density bonuses may or may not fit with identified community goals.

Another important consideration is the level to which density incentives need to go to be attractive for developers. Sample density incentives that illustrate a reasonable relationship between developer expense and increases in housing allowance include:

- Allow developers to add two additional market rate houses to the site yield for every house within the original yield that is deed restricted to "affordable" levels. Communities that employ this approach must also "cap" the overall unit increase, and several communities have used 50% as the allowable increase;
- Allow developers an additional two housing units if existing historic structures, such as barns, are preserved as amenities for the residents;
- Allow developers the addition of a single unit of housing for every voluntary 10% increase in upland open space over the required minimum. As with the affordable housing bonus, communities may require a "cap" on the overall increase in housing;
- Allow developers an increase in housing yield for restoration efforts related to forested buffers or wetlands. This density bonus is more site specific, as costs related to restoration will depend on the state of existing degradation, the potential for increased state-level permitting and other constraints such as steep slopes.

Establishing yield and CSD design process:

There are two potential methods for determining a property's "yield", or the number of lots that can be built on a given property. One method is to use a formula approach that assigns a value to the amount of land that is buildable based on a series of constraints (such as wetlands, steep slopes, critical natural resources, etc.) and computes the number of lots that can be built on that based on the remaining amount of buildable land. The second method is to require the applicant to develop a basic site plan for a property to determine the yield through the traditional development review process. While the formula approach can be an easier process from the applicant's perspective, it can also lead to miscalculation of buildable area due to missing information. The recommended method is to use utilize the site plan process to develop a yield plan as this is generally a

more reliable procedure for determine the number of buildable lots. The yield plan requirements should ask for a reasonable amount of information while not being unduly burdensome to the applicant. The yield plan should only require as much information as a basic concept plan that shows property boundaries, rights-of-way, and lots in comparison with site constraints. This ensures that the definition of "buildable area" remains consistent for both subdivision plans and CSD yield plans so the base yield cannot be changed by opting for a CSD.

From this point, the process for plan development is recommended to follow four basic steps:

- Step 1: Identify Conservation Areas. These areas include wetlands, floodplains, buffers to streams, wildlife habitats, and historic features. The community should analyze and evaluate the site in context to surrounding areas in order to identify the features that should be preserved within the designated conservation area. It is important the communities distinguish between regulatory conservation areas and non-regulated areas. The conservation identification process should focus on targeting the open space areas of highest value that are not protected under the municipality's conventional subdivision and wetland/watercourse regulations.
- Step 2: Identify Building Areas. Once the maximum number of units has been established, the development or buildable area can now be identified. House sites are located to maximize access to open space and proximity to views.
- Step 3: Align Roads, Trails, and Other Infrastructure. Avoid excess impervious surfaces by minimizing road length and widths. Roads should minimize disturbance to the site by following the natural terrain of the land where possible.
- Step 4: Draw Lot Lines. Lot lines will establish ownership and management of the preserved open space.

Currently, two SRW communities, East Hampton and East Haddam, utilize the four step process within their regulations. It is important to note that steps two and three above can be interchanged if there are site constraints such as steep slopes or challenging terrain suggesting that aligning roads properly may be a higher priority than locating housing.

Design flexibility:

A major factor that allows CSD to conserve more open space than conventional subdivisions is the added design flexibility. CSD standards provide the developer with flexibility through a variety of elements such as minimizing lot sizes, lot frontages, and building setbacks, while increasing lot coverage percentages. The amount of flexibility that a municipality chooses to build into its regulations should be directly correlated to its open space goals. For example, if the municipality wants to achieve 50% open space on a site, then the design flexibility must reduce housing dimensions to take up less than half the space as the underlying regulations. Within the SRW communities, the Town of Haddam requires the highest percentage of open space in its CSD with a requirement of attaining 45-55% open space. Notably, Haddam also provides the most design flexibility within its regulations.

Dedication and management of open space:

There are many ways in which CSD regulations can address the dedication and management of open space. Dedication of open space can take place through a variety of methods such as, but not limited to:

- Conveyance of fee simple ownership to the municipality;
- Creation of a conservation easement to the municipality;
- Conveyance of fee simple ownership to a tax-exempt organization;
- Creation of a conservation easement to a tax-exempt organization; and
- Conveyance of fee simple ownership to a Connecticut non-stock corporation of which all owners of the land within the subdivision are members (i.e., a home-owners association).

Of the options presented above, it is recommended that communities identify their preferred method of dedication while also keeping an eye towards providing options for the applicant. The Town of Hebron employs an effective strategy for incorporating their preferred methods of dedication into the regulations by providing a schedule of open space credits with differing values as an incentive for compliance. For example, Hebron provides one full credit for each acre of land dedicated through conveyance of fee simple ownership to the Town or a tax-exempt organization, and provides one-half credit for each acre dedicated through any other approved methods.

A CSD should also include language that explicitly discusses the responsibilities for managing the open space. This should include some basic language for delineating the boundaries of open space, the associations or groups that will be responsible for maintaining the open space, and the enforcement actions that the municipality may take for not complying with management policies. Where municipalities will not own dedicated open space lands, rights of access must be guaranteed to the municipality in these agreements for cases where prolonged neglect, illegal activities (e.g., dumping) or emergency access is required.

Implementation of CSD review:

Communities that choose to pursue the adoption of CSD standards as described herein should carefully consider how the four-step site planning process would fit within their review structure. Where multiple resources on a single site may compete for protection, the reviewing agency may need to prioritize or make suggestions to a proponent for alternative layout schemes. In addition, the authority should be open to a flexible design process that includes the possibility of various lot sizes, frontages, and setbacks within the site design, rather than the usual "one size fits all" approach.

CSDs should be viewed as a resource-based partnership approach to site development. There should be inter-agency cooperation (such as a “multi-board” meeting requirement) formally integrated into the review process from the pre-application stage to the concept

plan process to subdivision plan review. The local Open Space Committee, Agricultural Commission, Watershed Association, and Neighborhood Organizations, can be integrated early in the process, also, either formally or informally.

Table 2. Summary of Key CSD Recommendations

Issue	**Recommendation**
Optional vs. required design	Establish required CSD design for any subdivision above the applicability threshold. Streamline application process.
Applicability	Decrease applicability threshold as much as possible with consideration for development review and open space management capacity.
Minimum open space requirements	Approximately 35-50%. Must first assess community open space goals and ensure that design standards allow the achievement of those goals. Encourage conservation of natural areas as opposed to active recreation.
Density incentives	Assess community goals to provide density incentives that encourage appropriate development on a site-by-site basis. Allow density bonus for restoration efforts related to forested buffers or wetlands on the site.
Establishing yield and CSD design process	Utilize the site plan process to develop the yield plan. Require the four step design process.
Design flexibility	Assess community open space goals and provide adequate design flexibility to achieve those goals.
Dedication and management of open space	Provide a range of suitable options for open space dedication methods and incentivize the preferred methods. Provide requirements for maintaining open space and specify municipal enforcement actions.
Implementation of CSD review	Incorporate formal inter-agency cooperation into the review process. Reviewing agencies must be open to a flexible design process.

Roadway Design Requirements

Roadway design is a critical component to the management of impervious surface coverage and limiting negative impacts of stormwater runoff. When examining the standards in most local subdivision regulations, the primary goals of conventional roadway design are capacity, efficiency, and safety. While all are vitally important, there is a growing consensus that concerns regarding capacity, efficiency and safety have led to the "over-design" of many roadways. Excessive right-of-way widths and over-sized paved roadways are often constructed to service very modest subdivisions and the resulting infrastructure creates an unreasonable burden on the environment as well as municipal services. The challenge, therefore, is to balance the access and safety needs of new construction with the over-arching goals of reducing the amount of pavement and infrastructure associated with new roads.

One of the most difficult discussions that occurs on the local level involves the perceived conflict between innovative roadway design, also called low impact development (LID) roadway design, and issues of safety and access. While many local planners or developers may promote smaller roadways and open section drainage, other local officials or citizens may see these designs as "unsafe" for pedestrians or insufficient for emergency vehicle access. This challenge has been the subject of considerable research in recent years as indicated by publications from national organizations such as the Institute of Transportation Engineers (ITE) and the American Association of State and Highway Transportation Officials (AASHTO). In the context of these national standards, the following section includes guidance on how to develop lower impact roads in an effort to reconcile some of the perceived conflicts between efficiency and LID.

Conventional local road design:

Conventional design of local roads has typically focused on the efficient movement of vehicles and vehicular safety, to the detriment of other functions such as pedestrian activities, environmental concerns, cost and community aesthetics. For example, the majority of minimum paved roadway widths within the SRW communities varies between 22-28 feet. Road widths on the higher end of this range (26-28 feet) generally provide one slightly undersized 6-8 foot parking lane and two 10-foot travel lanes. These standards represent an appropriate design choice for streets with high traffic flows, and where ample on-street parking is required. In many cases, a width this wide is not needed for lower density housing developments. The "over-design" of subdivision roadways can result in a number of problems such as:

- Vehicle speeds can increase, posing a safety risk to both drivers and pedestrians;
- Capital expenditures for construction and maintenance are unnecessarily high;
- Larger rights-of-way (ROW) increase clearing and reduce the amount of land available for tax generating development; and
- Larger impervious areas increase stormwater runoff volumes and flow rates, and reduce groundwater infiltration. Pollutant loads are also increased, especially

where standard curb and enclosed drainage systems are used to convey and manage stormwater.

LID criteria:

There is a growing consensus that better design criteria are required for local roads. As far back as 1974, the American Society of Civil Engineers (ASCE), Urban Land Institute (ULI) and National Homebuilders Association (NHBA) published *Residential Streets*, an early attempt to develop local road designs that were not based on highway standards. A subsequent edition published in 1993, and others such as *Guidelines for Residential Street Design* (ITE, 1997) and *Guidelines for Design of Very Low-Volume Local Roads* (AASHTO, 2001) further develop the design of roads tailored to the local setting. These studies and guidance reflect a growing awareness that there are tangible benefits to building shorter, narrower roads. These advantages include:

- Encouraging moderate speeds through residential neighborhoods;
- Saving capital and resources;
- Creating neighborhoods that are pedestrian friendly;
- Preserving valuable open space and agricultural land; and,
- Minimizing impervious area and associated stormwater impacts.

The authority, and responsibility, for creating and implementing LID standards for local roads is generally at the municipal level. The guidelines developed by AASHTO, ITE, and others are good starting points, but are recommendations rather than rules. The following elements of design criteria for roads are considered in this section:

- Right-of-way (ROW) width;
- Minimum travel-way width;
- Driveway design;
- Curb requirements; and
- Cul-de-sac design;

See Table 3 on the following page for a detailed comparison of existing roadway regulations within the SRW communities.

ROW width:

The ROW is the total land area that contains all elements of a public or private road such as pavement, utilities, sidewalks, and shoulders. Therefore this area must be wide enough to enclose all of the cross-sectional features of the roadway, including the pavement width, curbing, buffers, sidewalks, stormwater management, and grading. All of the SWR communities require a 50-foot ROW for local or minor roadways with the exception of Glastonbury, which requires a 40-foot ROW. A 50-foot ROW is common in higher density suburban settings where traffic volumes and utility requirements may necessitate higher

Table 3. SRW Community Comparison-Roadway Design Standards

Watershed Towns	Bolton	Colchester	Columbia	East Haddam	East Hampton	Glastonbury	Haddam	Hebron	Marlborough
Minimum Street Width (Local)	26 feet	30 feet. Can be 26 feet if street is less than 2,800 feet, serves less than 40 units, and geologic features prevent likelihood of expanding street beyond 2,800.	24 feet. Commission has discretion to reduce to 22 feet.	18-26 feet. Discretion given to Commission.	26-28 feet	22 feet	24 feet. Commission has discretion to reduce to 22 feet for short loop roads (less than 2,000 feet).	22 feet	22-28 feet. Commission has discretion to reduced further.
Right of Way (Local)	50 feet	50 feet	50 feet	50 feet	50 feet	40 feet	50 feet	50 feet. Can be more if swales included.	50 feet
Cul-de-sac Service Area	Not > 20 lots	Not > 40 lots	Not > 15 lots	Not > 20 lots	Not > 20 lots	Not specified	Not specified	Not > 20 lots	Not specified
Cul-de-sac Length	Not specified	< 1,800 feet. Can be up to 2,800 feet if temporary extension of a through road.	< 1,200 feet	< 2,000 feet	< 1,500 feet	< 1,500 feet. Can get a waiver for more for purposes of future roadway access.	< 1,000 feet. Can be longer if street will be turned into a through street.	< 2,000 feet	< 1,000 feet. Can be 2,000 feet if applicant can demonstrate no hazard to public welfare. Can be 3,000 feet if applicant can demonstrate ability to construct through street in future.
Cul-de-sac Width	26 feet	26 feet. Can be 24 feet if less than 800 feet and serves less than 10 lots.	24 feet. Commission has discretion to reduce to 22 feet.	18-26 feet. Discretion given to Commission.	24-28 feet	25 feet	24 feet. 22 feet for permanent cul-de-sac.	22-24 feet	22-28 feet. Can be reduced by 2 feet with Commission's discretion.
Cul-de-sac Minimum Turnaround Radius	50 feet	50 feet	45 feet	50 feet	40 feet	45 feet	Not specified	45 feet	60 feet
Cul-de-sac Island Allowed	Not specified	Yes	Yes	Not specified	No	No. "T" and "Y" turnarounds are allowed.	Yes	Yes. "T" and "Y" turnarounds are allowed.	Yes
Minimum Driveway Width	12 feet	12 feet	12 feet	10 feet	No minimum	Not specified	Not specified	10 feet	10 feet
Common Driveways Promoted	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes

space requirements. In rural settings, it is not uncommon to see slightly reduced standards such as a 40-foot ROW for 22-foot wide minor streets. ITE guidelines are more conservative, recommending a minimum ROW width of 50 feet for low-density development and 60 feet for medium and high-density developments.

In practice, wide ROWs reduce the amount of land that may be developed and increase the amount of clearing and grading that must occur, creating negative environmental and economic effects. The ROW need only be wide enough to contain all of the cross-sectional elements. These elements may include sidewalks, utility easements, parking lanes, and travel lanes depending on the size, density and location of the development. For example, for two nine-foot paved lanes with five-foot sidewalks that are offset six feet from the road and one foot from the edge of the property lines, the ROW may be as narrow as 42 feet. Similar reductions can be made for higher-order streets. ROW widths of 24 to 52 feet are practical for most applications.

When accounting for all of the potential elements that increase the width of a ROW, it may be helpful to consider innovative approaches to roadway design. For example, allowing utilities to be placed beneath the paved section of the street would allow for reduced ROW widths and may also create space along the edge of the ROW for conveying stormwater through open channels. Open channels can be used to meet water quality treatment requirements and should be accounted for when determining ROW. For example, the Town of Hebron's ROW includes language that specifically allows for a wider ROW if the development includes roadside swales.

Minimum paved street width:

Roadways should be wide enough to accommodate travel lanes, street parking (if required), and the passage of emergency vehicles and routine delivery vehicles (e.g., UPS trucks). Minimum roadway widths within the SRW communities vary between 22-28 feet. While street widths as high as 26-28 feet are appropriate for high-density development with on-street parking, they may be excessive for the majority of subdivision development occurring within the watershed. For example, AASHTO recommends that a two-lane rural road traveled at 25 mph should be 18 feet wide, while a rural major/collector road should be 20 feet wide. (AASHTO, 2001; ITE, 1997). See Table 4 for a summary of typical pavement width requirements and recommendations.

Table 4. Survey of Minimum Pavement Widths (ft)

	AASHTO <= 400 ADT	ITE	ULI/ASCE	Recommended Minimum
Rural Minor Road *25 mph*	18	20	20	18
Rural Major/Collector *45 mph*	20	24	-	24
Urban Minor *Parking Dependent*	20-28	20-28	22-26	20
Urban Major/Collector	28-34	24-36	24-36	24
Urban cul-de-sac*	20-28	-	-	20
Minor Agricultural Road	18	-	-	18
Design Vehicle Dimensions: Passenger Car—7 feet wide, 19 feet long Single Unit Truck—8.6 feet wide, 30 feet long				

*In practice, often defers to the minor/local road requirement depending on subdivision size.

Minimizing the pavement width has several advantages. First, the developer will save money on labor and materials. Second, for publicly maintained roads, municipalities will save money on repair and repaving costs, snow plowing and street sweeping. Third, the ROW width and associated clearing will be reduced, and stormwater impacts will be minimized. Fourth, reduced development envelopes increase the potential for more open space. Finally, narrower roads reduce vehicle speeds, enhancing safety and increasing the quality of life for nearby residences.

One way to reduce the paved width of a road is to use a queuing lane. Where traffic flow is low, two-way traffic can use a single lane, and passing vehicles can queue in the parking lane as necessary. AASHTO recommends that a single travel lane be nine to 12 feet wide, and that parking lanes be eight to 12 feet wide (AASHTO, 2004). Parking widths of six to seven feet may be appropriate at low speeds. AASHTO recommends that the use of a queuing lane be limited to those streets receiving 50 or less average daily trips (ADT) (AASHTO, 2001). However, queuing lanes can be effective for most local streets and even the smallest collector streets, (often termed 'sub-collector' streets), provided that traffic flows do not require the establishment of two clear lanes of travel.

Sufficient width must be provided for the use of emergency vehicles. The vehicle most commonly referenced as a "design vehicle" is a ladder truck used for fighting fires. This vehicle can navigate the typical nine to 10-foot lane outlined above, but needs extra space for setting up its outriggers when raising the ladder.

The National Fire Protection Administration recommends that a 20-foot unobstructed way be provided; some states such as Massachusetts and Virginia require an 18-foot width. Where street parking does not occur and the shoulder is constructed of a firm, stable material, the ladder truck can set up one of its supports on the shoulder.

Driveway design:

Driveways must be wide enough to allow for the passage of vehicles, and long enough to satisfy off-street parking requirements. Driveway widths within the SRW communities range from 10-12 feet, with some towns not providing a specific requirement. Typically, a 10-foot wide drive is more than sufficient for one vehicle, while 20-foot wide drives are often used for two-car garages connected directly to the street (ITE, 1997). Widths of nine feet may be sufficient for each automobile lane depending on the location of the driveway relative to the building. Driveways should always be designed with proper slopes, sight distances, and turning radii.

One way to reduce the total amount of impervious area required by driveways in a development is to use common or shared driveways. These are privately owned and maintained drives, typically 12 to 16 feet wide. Careful design can provide sufficient space for overflow parking while reducing the overall area required. Important considerations for common driveways include:

- The maximum allowable number of homes that may be served by a common driveway. Typical standards range from two to six homes.
- The type of shared driveway covenant that will be used by the homeowners to ensure that maintenance responsibilities are clearly described and adequately enforced.
- Depending on the number of homes shared, there is the potential for locating larger shared features such as mail repositories and trash removal pads at the end of the driveway. Communities may wish to include design specifications for these areas to ensure aesthetic appeal and the reduction of potential nuisances.

Eight of the participating SRW communities promote the use of common driveways in their regulations. It is recommended that communities evaluate their regulations as they relate to common driveways and ensure that this option is adequately encouraged as a means to reduce impervious surface coverage for new developments.

Curb requirements:

Curbs establish a clear boundary between the edge of the road and non-vehicle zones within the ROW, guarding against erosion and protecting the roadway edge. Curbing also protects pedestrians and is an integral part of a closed

drainage system, effectively delivering stormwater runoff to collection inlets and drainage pipes. Vertical curbing is most commonly used in urban areas and is recommended by ITE for all medium-to high-density developments (ITE, 1997). Rolled curbing, or asphalt berm, is less expensive and is typically used in medium to low-density developments. While vertical curbing provides greater protection for pedestrians, rolled curbing allows for on-street parking to occur on part of the shoulder, and facilitates driveway construction.

Despite the apparent efficiencies associated with raised curbing, there are several disadvantages to using this design approach, particularly relative to LID implementation. One disadvantage to curbing is cost; it is much more expensive to build a road with curbs and a closed drainage system than with vegetative shoulders and open swales. Curbs also prevent stormwater runoff from infiltrating along the side of the road, and serve to concentrate pollutants at the ultimate discharge location. As a result, more runoff occurs at higher pollutant concentrations on curbed streets. In addition, curb to pipe conveyance systems quickly carry stormwater to downstream water bodies, increasing peak flows that can cause flooding and erosion problems. More detail regarding best practices for stormwater management techniques is provided in the following section of this report. Where practical, curbing should be eliminated and open drainage swales should be used in lieu of closed drainage systems. In *Rural By Design*, Randal Arendt recommends that curbed roads only be used where higher densities prohibit the use of swales (four or more units per acre), or where roadside erosion is a concern due to steep slopes of eight percent or more (Arendt, 1994).

One common argument against eliminating curbs is that it may increase the potential for surface erosion or failure of the road surface at the pavement edge. However, these effects can be mitigated by hardening the pavement grass interface through the use of grass pavers, or a low-rising concrete strip (CWP, 1998). The use of such a strip also increases the visibility of the roadway edge, enhancing traffic safety at night.

Cul-de-sac design:

Lanes and ways terminating in a cul-de-sac offer lower vehicle flows and speeds, increasing a sense of privacy in residential development. However, these dead end streets offer reduced access in the time of an emergency and can increase the total impervious area of a development. Building narrow streets with sharper turns is a preferable alternative to cul-de-sacs, since it can accomplish the same goal of reducing traffic disturbances, while maintaining essential connectivity between neighborhoods. Where cul-de-sacs must be built, they are generally designed for a maximum of 200 ADT. This is approximately equal to the traffic generated by 20 to 25 houses at 8 to 10 trips per day. The best method for regulating cul-de-sac size is by limiting the number of lots within a cul-de-sac service area. Many of the SRW communities have established a maximum cul-de-sac service area of 20 lots. This is an appropriate requirement for a suburban

and rural environment in regards to traffic management and limiting overall cul-de-sac size. It is recommended that each SRW community evaluate its service area regulations and provide restrictions on the number of homes within a single subdivision that can be served by a cul-de-sac.

Establishing a maximum cul-de-sac length can be another mechanism for limiting impervious surface coverage. This requires developers to limit unnecessary sections or roadway and encourages a more compact development pattern. The SRW communities exhibit a wide range of maximum cul-de-sac lengths with requirements from 1,000 feet to 2,000 feet. A maximum cul-de-sac length should be determined with consideration for the maximum cul-de-sac service area and the minimum lot frontage requirement in the underlying zoning district. For example, if a community sets the maximum service area at 20 lots and the underlying zoning district requires 200 feet of frontage, then the community should set the maximum cul-de-sac length at approximately 2,000 feet or more to accommodate the maximum number of lots allowed assuming housing occurs on each side of the street. Communities may want to consider establishing different cul-de-sac length requirements within different zoning districts depending on the variation of lot frontage requirements. Another consideration for establishing a maximum cul-de-sac length is to allow exceptions based on the opportunity to extend the cul-de-sac into a through street. Several SRW communities have regulations similar to this such as Colchester, Marlborough, Haddam, and Glastonbury. The regulations help support protection of water resource quality by encouraging a more compact pattern of development that reduces development pressure on undisturbed open spaces.

A cul-de-sac can terminate in a variety of designs such as a circular turnaround, a "T" turnaround, or a "Y" turnaround. The most typical design is the circular turnaround. A circular cul-de-sac terminus must have a turning radius wide enough to accommodate large vehicles such as fire trucks or school buses. Many communities have interpreted this need as requiring an external minimum radius of 50 to 60 feet, which can result in paved areas over 11,000 square feet just for the turning portion of the roadway. The range of values within the SRW communities varies from 40 to 60 feet. There are a range of fire truck manufacturers that produce vehicles that have reduced turning radii, and the paved radius may therefore be reduced to 35 to 45 feet in some cases (ASCE, 1990). Each community should work with its emergency services personnel to determine a minimum radius that provides for adequate safety while also minimizing impervious surfaces.

Another strategy to minimizing impervious area within a circular turnaround is to allow a vegetated island in the center, provided that a sufficient paved width is maintained, (ITE recommends a minimum of 25 feet). Landscaped islands can also be used to receive and treat stormwater to meet stormwater quality requirements. Of the nine SWR communities, five contain regulations that specifically allow for cul-de-sac islands (Table 3). It is recommended that all the

communities consider allowing landscaped islands within their regulations to expand options for innovative design. Aside from circular turnarounds, alternative cul-de-sac designs include "Y" or "T" turnarounds. These alternative designs are more appropriate for streets shorter than 200 feet in length and offer significant reductions in impervious area over the standard cul-de-sac. A loop road is also a good option; these provide multiple access points for emergency vehicles and can carry double the traffic volume of a cul-de-sac. Loop roads also favor the construction of "T" style intersections, which offer numerous benefits. Alternative terminus design such as "T" or "Y" intersections are currently allowed by the Towns of Hebron and Glastonbury. It is recommended that all the SWR towns explore the option of allowing for alternative design to provide developers with more environmentally friendly options.

Table 5. Summary of Key Roadway Design Requirements and LID Recommendations

Design Criteria		**Units**	**Guidelines**		
			AASHTO	ITE	**Recommended**
ROW	Width	ft	-	50 to 60	**Approximately 42 feet. Allow flexibility to account for various elements.**
Pavement Width	Single Lane	ft	10-12	-	**9**
	Parking Lane	ft	8-12	-	**6-8**
	Minor Rural Road	ft	18	-	**18**
	Minor Urban Road	ft	20-28	20-28	**20-24**
Driveways	Width, Max number of lots	ft, #	16, 6	-	**10, 6**
Curb	Required at Density	Units/ acre	-	2	**Approximately 4. Allow flexibility if including LID.**
Cul-de-sac	Traffic flow	ADT	200	200	**200**
	Maximum service area		-	-	**20 lots**
	Maximum length	ft	-	700-1,500	**Varies based on lot frontage requirements.**
	Minimum radius	ft	-	45	**35-45**

Stormwater Management

Fast-running, cold-water streams, like those within the Salmon River Watershed, are extremely sensitive to changes in benthic habitat, stream temperature, and water quality which makes them highly susceptible to the impacts of urban stormwater runoff. Table 6 summarizes the various impacts of stormwater runoff as a result of increased watershed impervious cover on fish and other aquatic species. Increased peak flows and reduced baseflows associated with watershed development, can widen channels and reduce benthic habitat (i.e. loss of riffle/pool structure that provides foraging habitat and cool water refugia). Sediment deposition from construction sites, channel erosion, and road sanding can smother benthic habitats and result in loss of critical fish spawning areas, clog fish gills, and harm the aquatic insects on which fish depend for food. In fact, increased watershed impervious cover and associated increases in stormwater runoff, have been shown to negatively impact salmonid (trout and salmon) populations throughout the Pacific Northwest, Canada, and the Mid-Atlantic region. Reports on the subject determined that trout were rarely found in watersheds exceeding 15% impervious cover (May et al., 1997). Additional studies looked at over 1,000 Maryland streams and only found sensitive brook trout in streams with less than 4% watershed impervious cover (Boward et al., 1999).

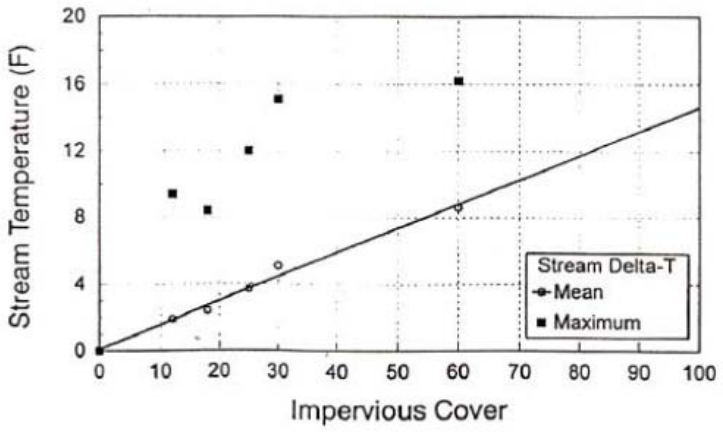
Table 6. Effects on Fish from Increased Watershed Imperviousness and Stormwater Impacts (CWP, 2003).

Stream Change	Effects on Organisms
Increased flow volumes/ Channel forming storms	Alterations in habitat complexity Changes in availability of food organisms, related to timing of emergence and recovery after disturbance Reduced prey diversity Scour-related mortality Long-term depletion of LWD Accelerated streambank erosion
Decreased base flows	Crowding and increased competition for foraging sites Increased vulnerability to predation Increased fine sediment deposition
Increase in sediment transport	Reduced survival of eggs and alevins, loss of habitat due to deposition Siltation of pool areas, reduced macroinvertebrate reproduction
Loss of pools and riffles	Shift in the balance of species due to habitat change Loss of deep water cover and feeding areas
Changes in substrate composition	Reduced survival of eggs Loss of inter-gravel fry refugial spaces Reduced aquatic insect production
Loss of LWD	Loss of cover from predators and high flows Reduced sediment and organic matter storage Reduced pool formation and organic substrate for aquatic insects
Increase in temperature	Changes in migration patterns Increased metabolic activity, increased disease and parasite susceptibility Increased mortality of sensitive fish
Creation of fish blockages	Loss of spawning habitat for adults Inability to reach overwintering sites Loss of summer rearing habitat, Increased vulnerability to predation
Loss of vegetative rooting systems	Decreased channel stability Loss of undercut banks Reduced streambank integrity
Channel straightening or hardening	Increased stream scour Loss of habitat complexity
Reduction in water quality	Reduced survival of eggs and alevins Acute and chronic toxicity to juveniles and adult fish Increased physiological stress
Increase in turbidity	Reduced survival of eggs Reduced plant productivity Physiological stress on aquatic organisms
Algae blooms	Oxygen depletion due to algal blooms, increased eutrophication rate of standing waters

Research also shows a direct correlation between the amount of watershed imperviousness and stream temperature fluctuations (Figure 4), and that stormwater runoff from hot parking lots and rooftops can elevate stream temperatures from 5-18 degrees (Paul, et al., 2001; Johnston, 1995; Leblanc et al. 1997; Galli, 1990; Roa-Espinosa *et al*. 2003; SSL SWCD, 2001). Measurable increases in water temperature

have also been documented in unshaded streams lacking forested buffers, and in streams where stormwater detention ponds discharge warmer waters (MCDEP, 2000; SWAMP, 2000a; Galli, 1990). Optimal temperatures for adult trout range from 57°F to 65°F, and juvenile trout, fry and eggs are more sensitive to minor temperature shifts than adults. Stream warming reduces dissolved oxygen availability and can lead to an increased sensitivity to other pollutants and diseases.

Figure 4. Stream Temperature Increase in Response to Increased Watershed Impervious Cover in the Maryland Piedmont (Source Galli, 1990 from CWP, 2003).



Water quality impairments from road salts, polycyclic aromatic hydrocarbons (PAH), nutrients, and other urban stormwater contaminants can be toxic to trout and other biological assemblages. It is precisely these impacts to sensitive aquatic resources that prompts regulatory control over stormwater discharges. Federal Clean Water Act requirements pertaining to stormwater management and non-point source pollution are administered in Connecticut by the Department of Environmental Protection (CTDEP) as part of the National Pollution Discharge Elimination System (NPDES). To obtain NPDES permit coverage, all construction sites disturbing over one acre, most industrial sites, and all designated municipal separate storm and sewer systems (MS4s) are required to treat stormwater to the maximum extent practicable and remove 80% of total suspended solids (TSS) prior to discharge. Small MS4s must develop local stormwater programs to implement erosion and sediment control standards, regulate stormwater discharges, eliminate illicit connections, practice good housekeeping, and involve and educate the public on stormwater management. East Hampton, Marlborough, Hebron, Haddam, Bolton, and Glastonbury are all included under the small MS4 NPDES program.

Guidance for managing stormwater runoff is outlined in the 2004 Connecticut Stormwater Quality Manual and the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. Local regulatory programs should meet the basic standards and design criteria as outlined in these manuals; however, neither manual has specific treatment criteria for protection of cold-water streams. Due to the extreme sensitivity of cool- and

cold-water stream habitat to stormwater impacts, we recommend communities within the Salmon River Watershed evaluate their regulations and programs in the following areas:

- Stormwater management requirements;
- Stormwater practice, design, selection, and maintenance; and
- Environmentally sensitive design/LID.

Table 7 on the following page illustrates a comparison of existing stormwater regulations within the SRW.

Stormwater Management Requirements:

The current CT stormwater manual requires treatment of the first inch of runoff, maintenance of pre-development groundwater recharge volumes and peak discharge rates for 10-, 25-, and 100-year storm, as well as channel protection criteria. Water quality volumes (WQV) are used to help remove pollutants through filtration, settling, or plant uptake from the "dirtiest" portion of the rain event (typically the first inch of rainfall). Recharge volumes are used to infiltrate a portion of runoff back into the ground to maintain baseflow and groundwater supplies. Channel protection criteria are intended to prevent erosion of stream channels from stormwater detention practices and peak controls are to help prevent downstream flooding. For discharges within 500 feet of tidal wetlands, CT also requires the first inch of runoff be retained on site (runoff capture volume). This effectively reduces the volume of runoff leaving the site and requires infiltration, storage/reuse, evapotranspiration, or other mechanism. There are no additional criteria for discharges to cold-water resources. Maine, Minnesota, and Rhode Island all have special stormwater criteria for trout waters. We recommend that each of the nine communities consider implementing special stormwater criteria within the SRW as summarized in Table 9 later in this section.

Communities within the SRW should also consider updating local rainfall averages based on more recent data if current rainfall numbers are over 20 years old. There is little research available on how changing climate will impact cold-water fisheries and rainfall throughout the region, although this is becoming increasingly important.

Each community, particularly those designated as MS4s should complete an internal review of pollution prevention activities (good housekeeping at maintenance yards, street sweeping, road deicing, etc.) to minimize pollutant generating behaviors. In particular, all stormwater hotspots (land uses with higher pollutant loading potential) in the SRW should be evaluated for retrofit or non-structural pollution prevention opportunities. Each community should evaluate road deicing procedures and practices to minimize chloride and sediment impacts on cool- and cold-water stream habitat. Consider establishing criteria for equipment and materials, as well as for pretreatment of road drainages and inlets draining directly to cool- and cold-water streams. Many communities within the watershed are switching to an all salt mixture for winter roadway maintenance. While this may have a positive impact in terms of reducing sediment clean-up demands, the

Table 7. SRW Community Comparison-Stormwater Management

Watershed Towns	Bolton	Colchester	Columbia	East Haddam	East Hampton	Glastonbury	Haddam	Hebron	Marlborough
"Open" Drainage Systems	Drainage swales, ditches and channels shall be designed to convey the maximum flows computed without erosion or overtopping.	Use of "channels" to carry stormwater shall not be allowed except with approval of Town Engineer.	Design of the storm water management system shall consider reducing runoff by use of such techniques as minimizing impervious areas and maximizing travel times by using grass or rock-lined channels in lieu of storm sewers.	SW practices should seek to utilize pervious areas for stormwater treatment and to infiltrate stormwater runoff from driveways, sidewalks, rooftops, parking lots, and landscaped areas to the maximum extent possible to provide treatment.	Use of "channels" to carry stormwater shall not be allowed except in special cases with Town approval.	SW Management Plan in 2004 that discusses implementation of several regulatory changes. Unclear status of regulatory changes.	Allowances for use of open “ditches” to convey stormwater. Paved gutters shall be designed along the edge of any street pavement with a grade of 5% or as deemed necessary by the Town Engineer.	Allowances for alternative drainage systems that incorporate off-road swales in lieu of catch basins and piping. Regulations include design criteria for “open channels”. Listing of culvert crossing standards based on different structure sizes.	Development shall use best available technology to minimize off-site runoff, increase in-site infiltration, simulate natural drainage systems, and minimize off-site discharge of pollutants, and encourage natural filtration systems.
SW Management Plan must meet performance criteria in 2004 DEP manual?	Yes- for basins	No	Yes- for basins and methods to estimate peak flows and runoff	Yes	Yes	Yes; extensive requirements in SW Management Plan	No	Yes	No
SW Maintenance plan required	No	No	Yes	Yes	Case by case	Yes if detention/catch basin	Unclear	Yes if more than 1 acre disturbed	No
ESC Disturbance thresholds	1/2 acre or >10% grade	1/2 acre (single lot SFR exemption, unless part of subdivision)	1/2 acre (single lot SFR exemption)	1/2 acre (single lot SFR exemption)	1/2 acre; WQ protection strategies mention limiting clearing during construction; and Lake Pocotopaug Protection Area requires strict ESC.	1/2 acre (single lot SFR exemption)	1/2 acre (single lot SFR exemption)	1/2 acre (single lot SFR exemption)	Zonining permit not given until ESC practices installed, inspected, and approved.
Reference 2002 ESC Guidance Manual	No. Reference CT Guidelines	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No. Reference CT Guidelines
On DEP Small MS4 list (NPDES Phase II)	Yes	No	No	No	Yes*	Yes	Yes*	Yes	Yes

research is still inconclusive if an all salt mixture is preferable to a sand-salt mixture in terms of the impacts to cool- and cold-water stream habitat.

Stormwater practice, design, selection, and maintenance:

Because thermal impacts from BMPs can be detrimental to cold-water fisheries, the practice design guidance in the CT stormwater manual recommends taking receiving waters into account when designing ponds and wetlands. Currently, however, a design supplement that summarizes specific design adaptations for cold-water fisheries that can be referenced by practitioners in the SRW does not exist. Some possible design features for BMPs are listed in Table 8:

Table 8. Design Features for Cool- and Cold-Water Stream Habitat (adapted from 2005 MN Stormwater Manual)

Do's	Don'ts
• Use infiltration and bioretention to the maximum extent possible. • Use micropools and forested wetland designs rather than large unshaded permanent pools or shallow wetlands. • Construct BMPs "off-line" (not in middle of stream flow). • Shade pilot and outflow channels and micropools by planting trees and shrubs. • Plant trees to the maximum extent possible in the stormwater practices and along stream buffers. • Outfall taken from bottom of pond rather than at surface. • Underground gravel trench outlets from detention basins. • Maximize use of better site design techniques. • Manage buffers to maximize forest cover and shading in riparian areas. • Pre-treat roadway runoff to reduce sediment and road sand discharges to streams.	• Large, unshaded permanent pool or shallow wetland. • Extensive and unshaded pilot and outflow channels within the BMP. • An extended detention time longer than 12 hours. • Extensive exposed riprap or concrete channel. • An on-line or in-stream location. • A location within the forested buffer. • Infiltration practices that are undersized or lack pre-treatment.

Selection of practices should be based on individual site characteristics, TSS removal efficiencies, and thermal considerations. We recommend inserting language into local regulations that clearly gives preference to infiltration and filtration practices and requires demonstration of hardship or thermal design adaptations for alternative practices. Additionally, long-term maintenance of stormwater practices is critical to maintaining assumed levels of performance of individual practices. Table 9 on the following page summarizes recommendations for municipalities related to practice design and selection.

Environmentally Sensitive Design/LID:

Site development techniques that minimize impervious cover, protect natural areas, and mimic natural hydrology onsite should be required in sensitive water resource areas. Often termed LID, or better site design, these environmentally sensitive design techniques can significantly reduce the volume of stormwater runoff generated on-site, provide significant opportunities for infiltration, and reduce off-site runoff volumes. Many communities unintentionally make this type of development difficult to approve due to barriers in zoning and subdivision regulations. As part of any development application review, communities should ensure that developments in cold-water basins are eligible for more "habitat-friendly" stormwater designs. Table 9 summarizes key site design elements local communities should incorporate into local development standards.

Table 9. Summary of Recommended Criteria for Municipal Stormwater Management for Cool- and Cold-Water Stream Habitat Protection in the Salmon River Watershed

Issue	**Recommendation**
Criteria	Adopt more stringent stormwater criteria to: • Increase total suspended solids (TSS) removal requirements from 80 to 90% since sediment loads are one of the primary pollutants of concern in cool- and cold-water stream habitat; • Require infiltration of excess runoff volume above that produced from the predevelopment 2- year, 24-hour storm event as a temperature control option for designated cool- and cold-water stream habitat, where soils conditions permit. If soils do not permit infiltration of the channel protection volume, then provide 12-hour extended detention of 1-year, 24-hour runoff volume in a thermally acceptable pond option; • Apply the volume reduction (capture volume) criteria (which currently only applies to tidal areas) throughout the SRW to require use of filtering and infiltration practices rather than surface detention practices (ponds, wetlands) that are subject to thermal heating. Requiring bioretention, dry swales, infiltration, rainwater harvesting, and better site design practices to manage stormwater and restricting new ponds and wetlands is recommended; • Prohibit discharges from stormwater ponds or wetlands within 200 feet of designated cold-water fisheries to reduce thermal impacts; and • Require underground gravel trench outlets or other thermal designs for stormwater discharges beyond 200 feet of cold-water fisheries.
Practice Selection and Design	Municipalities should require that: • Filtering and infiltration practices are used rather than surface detention practices (ponds, wetlands) that are subject to thermal heating. Require a demonstration of hardship or provide for thermal design adaptations for alternative practices. • Practices are designed for ease of maintenance as called for in the CT

	Stormwater Manual; • Detailed maintenance plans are submitted as part of the development review process (see Hebron Zoning Regulations as well as East Haddam, Glastonbury, and Columbia Subdivision Regulations); • "As built" plans be submitted upon completion of facility construction; • Performance bonds are adequate to ensure a given stormwater management practice functions appropriately in the short-term;
Environmentally sensitive site design	Ensure that local development regulations allow for the following: • Thermally-acceptable open drainage designs such as dry swales in lieu of curb and gutter (see Hebron, that allows for alternative drainage systems within Section 8.24 of its Zoning Regulations); • Minimal impervious cover through use of pervious pavements, narrow road widths, alternative turnarounds, minimal parking ratios and stall dimensions, and shared parking and driveways (see sections on Roadway Design Requirements and Parking Regulations); • Temporary ponding of water in yards to encourage rain gardens and other rooftop disconnection practices on individual residential lots; • Use of landscape islands in parking lots and cul-de-sacs for bioretention (see section on Roadway Design Requirements) • Shade/canopy cover targets for parking lots and riparian buffers; • Alternative layouts for sidewalks (more pedestrian friendly); • Alternative paving materials that have a higher solar reflective index (white surfaces being the best, black surfaces being the worst); • Setback and frontage distance flexibility to allow for increased housing density, shortening of road lengths, and preservation of more natural vegetated areas (see section on CSD). • Incentives to encourage additional stormwater treatment and/or volume reduction during redevelopment that provides an opportunity to improve existing stormwater management; • Open space management provisions preventing removal of forested buffer or requiring deforestation of impacted buffers (see section on Wetland/Watercourse Buffers); and • By-right or fast-track approval for Conservation Subdivision Design (see section on CSD).
Other	• Update rainfall averages using more recent, localized data; • Conduct internal review of pollution prevention activities at public facilities; • Evaluate road deicing procedures, equipment, and materials; • Establish a BMP tracking database to locate all existing and new BMPs and track scheduled maintenance inspections (at least in the SRW); • Educate Home Owners Associations and other parties responsible for maintenance of private BMPs on proper maintenance procedures; and • Ensure publicly-owned stormwater facilities are properly maintained.

Wetland / Watercourse Buffers and Associated Regulations

Native trees and shrubs along riparian corridors may be one of the most important factors in maintaining the quality of cool- and cold-water stream habitat. Loss of forested riparian buffers can result in increased water temperatures from lack of shading, destabilized stream banks, loss of large woody debris, and diminished food supply. Large woody debris is extremely important as it provides protective cover from predators, creates pools and resting areas, and provides habitat for the aquatic insects and small fish that trout eat. Vegetated riparian buffers, in some situations, also can provide water quality benefits by removing pollutants when runoff is directed as sheet flow across surface vegetation.

In Connecticut, non-tidal streams, wetlands, and the buffer areas protecting them are regulated, in part, by the Inland Wetland and Watercourses Act (the Act). Direct impacts of filling and dredging in wetlands under federal jurisdiction are permitted through the U.S. Army Corp of Engineers (USACOE) and the Department of Environmental Protection (DEP) regulates stormwater discharges. The Act authorizes municipalities to establish Inland Wetland Commissions responsible for reviewing and approving regulated activities that may harm adjacent streams and wetlands. Each municipality establishes a jurisdictional boundary called the Upland Review Area (URA) through local regulations. This area is not necessarily a prohibitive buffer, it merely triggers review by the Commission. Most of the communities within the SRW have established the URA within 50-100 feet of inland wetlands and watercourses, with a few notable exceptions:

- East Hampton extends the URA to 500 feet for the Salmon River and 150 feet for the Connecticut River.
- Marlborough URA is 200 feet in the Salmon River Corridor Wetland/Watercourse Conservation Area; 150 feet elsewhere.
- Hebron established a 200 or 300 foot URA for specified wetlands.
- Glastonbury has proposed to increase the URA from 100 feet to 150 feet with standards related to impervious surfaces.
- Columbia extends the URA to 200 feet in special areas of concern or if slopes are greater than 20%.

A more detailed description of the existing regulations within the SRW communities is provided in Table 10 on the following page. We recommend communities evaluate their buffer protection regulations in the following areas:

- Buffer Width, Uses and Vegetative Targets
- Specified Resource Protection
- Capacity to Review Activities Beyond the Buffer

Table 10. SRW Community Comparison-Wetlands and Waterways

Watershed Towns	Bolton	Colchester	Columbia	East Haddam	East Hampton	Glastonbury	Haddam	Hebron	Marlborough
Revision Date	2006	2007	2008	2004	2007	1989- Under revision	2000	2005	1993- Under review
Upland Review Area	100 feet Wetlands or Watercourse	75 feet Wetlands	100 feet Wetlands or Watercourse	100 feet for Conservation Subdiv or Eightmile River Watershed. (IWWR)	100 feet Wetland or Watercourse	100 feet Wetlands or Watercourse	100 feet from any major watercourses or contiguous wetlands, and all wetlands and watercourses in the Salmon River watershed and in Public Supply watersheds.	100 feet Wetlands or Watercourse	150 feet Wetlands or Watercourse
	50 feet for buildings or structures (ZR Section 3.A.7)	100 feet Watercourse High Waterline	200 feet for any wetland or watercourse listed in areas of special concern or if the slope is greater than 20%.	50 feet from high waterline (ZR)	Any development within 500 feet of Salmon River requires special permit (ZR p102) 150 feet Connecticut River	Proposed: 150 feet review area with standards relating to impervious surface coverage	50 feet for any other wetland or watercourse. If the average slope of the upland review area exceeds a 10% grade, an additional 50 feet shall be added.	300 feet for specified group of wetlands. (IWWR) 200 feet for another specified group of wetlands. (IWWR)	
Language to Regulate Impacts from Outside Upland Review Area	No	No	Yes	No	No	Yes	Yes	Yes	Yes

Buffer Width, Uses and Vegetative Targets:

The effectiveness of various riparian buffer widths has received much attention from the scientific and regulatory community, particularly in relation to water quality and local land use policy. Riparian buffers are defined as the vegetated area adjacent to streams. Buffer regulations typically define a width (as measured from the centerline of stream or the median high water elevation), designated and excluded uses, and vegetative targets for untouched or managed portions of the buffer. The URA widths establish review authority only, and should not be confused with the protection provided by a "no-touch" riparian buffer zone regulation. Many local buffer regulations across the country create setbacks for vegetative removal, structures, impervious surfaces, septic drain fields, and stormwater facilities. Standards for selective clearing and preferred vegetative composition (i.e. forested, native plants, turf) are often included, as well as criteria for stream crossings.

A summary of over 150 scientific studies of effective riparian buffer widths for a variety of biological, hydrologic, and physical functions is summarized by the Environmental Law Institute (2003). The USACOE released national recommendations for riparian buffer design in 2000 (Fischer and Fischneich, 2000). Table 11 on the following page summarizes a wide range of riparian buffer widths reported by these studies. For protection of cool- and cold-water stream habitat, a number of researchers have demonstrated that a larger protective buffer is needed. We recommend a 150-foot minimum "no touch" buffer zone be required for cool- and cold-water stream habitat protection. Effective riparian buffer widths reported for protecting cool- and cold-water stream habitat range from 50 to 200 feet. Meyer et al. (2005) studied the correlation between forested buffers, in stream temperature, and benthic substrate conditions in over 8,000 trout streams across northern Georgia to evaluate the impact of a state policy to reduce required buffer widths from 100 to 50 feet. They found that the reduction of forested riparian buffers widths from 100 to 50 feet resulted in a 3-4 degree increase in stream temperatures and 11% increase in sediment in riffle habitats. While this change seems insignificant, this shift is expected to reduce the young trout populations by 81-88%.

As part of a review of local watercourse and wetland buffer protection within the SRW, we recommend communities establish "no-touch" buffer widths within the URA to protect forested streamside areas critical for maintaining suitable cool- and cold-water stream habitat. As mentioned earlier, the authority provided to the Inland Wetlands Commissions is for review of impacts only, not prohibitions of use. Towns within the SRW have therefore relied on Zoning Regulations to establish these protections. The towns of Haddam and Bolton, for example, prohibit buildings and septic systems to be constructed within 50 feet to ensure a greater degree of protection of wetland and water course resources. Marlborough is exploring the possibility of incorporating a 50-70 foot "no structure" wetland buffer into their zoning code. These recommendations are a good measure to incorporate but are at the low end of recommended widths for cold-water fisheries protection (see Table 11).

Table 11. Reported Ranges of Recommended Buffer Widths Based on Watershed Function (adapted from Environmental Law Institute, 2003)

Function	Range of Riparian Buffer Widths	
	Environmental Law Institute (2003)	**Fischer and Fischneich (2000)**
Stream Stabilization	30-170 feet	30-65 feet
Water Quality Protection	15-300 feet (remove nutrients) 10-400 feet (remove sediment)	15-100 feet
Flood Attenuation	65-500 feet	65-500 feet
Riparian/Wildlife Habitat	10 feet-1 mile	100 feet-0.3 mile
Temperature/Microclimate Regulation	30-1,000 feet	--
Trout and Salmon/ Cold Water Fisheries	≥100 feet (5 studies) 50-200 feet (1 study)	--

Specified Resource Protection:

As noted previously, East Hampton and Marlborough both have expanded the URA jurisdiction in the SRW to 500 and 200 feet, respectively. Haddam increased the URA from 50 to 100 feet in the Salmon River watershed and in drinking water supply watersheds. Ideally, the other communities in the watershed will establish special criteria within the watershed to provide for a consistent watershed-wide management approach. Research has shown that the continuity of forested buffers along a stream corridor is related to stream quality, and that patchy buffer systems increase potential for invasive species establishment (source). As urbanization increases, more roads and utilities cross streams, creating additional fish barriers.

Inland wetland protection can also play a critical role for cool- and cold-water streams as wetlands help attenuate flood waters, filter pollutants, and recharge baseflows. Isolated wetlands not regulated by the USACOE (due to jurisdictional restrictions) are only protected at the local level, and therefore subject to the Inland Wetland and Watercourse Regulations (IWWR). Recent research on the importance of these small isolated and/or intermittent wetlands to overall watershed function are well-documented by the Center for Watershed Protection in the six part *Wetlands and Watershed Article* series *(Cappiella and Fraley-McNeal, 2007).*

Capacity to Review Activities beyond the Buffer:

Marlborough, Hebron, Haddam, Glastonbury, and Columbia all have included provisions within their regulations to allow for review of activities outside of the URA. Communities within the Salmon River watershed should consider the feasibility and legality of incorporating this type of language into IWWR to allow Commissions to

review major development activities within the watershed that may be outside the URA, but will have a direct or indirect impact on the wetlands and watercourses downstream. The Town of East Hampton also provides their Inland Wetland and Water Course Agency with the authority to review all Erosion and Sedimentation Control Plans for disturbances over one acre regardless of proximity to wetland buffer.

Table 12. Summary of Recommendations for Local Wetland and Watercourse Buffers to Protect Cool- and Cold-Water Stream Habitat

Buffer Design	• Minimum 150 feet, no disturbance, vegetated buffer within URA's in the Salmon River Watershed; and • Establish vegetative targets and excluded uses.
Special Resource Protection	• Designate Salmon River Watershed as a Special Resource Area and expand URA boundaries to 500 feet; • Coordinate across all jurisdictions to provide consistent buffer protection across the watershed to help provide for a continuous riparian corridor; and • Consider providing additional authority for Inland Wetlands Commission to review development activities in the watershed that may be outside the URA that will have a direct impact on aquatic resources.

Development Review Capacity

Within any municipality, it is important that the plan review process is as efficient as possible to support an accurate and effective application of the regulations. A municipal planning department has many responsibilities to applicants in the development review process, such as ensuring the process is timely, fair, information requests are reasonable and clear, and that fees are appropriate. They also have responsibilities to adjacent property owners and the general public, such as ensuring the review process protects the public interest, allows for public comment and discourse, and does not waste municipal resources.

With regard to the SRW, the capacity for any municipality to effectively administer development applications can be critical to protecting this resource. Not only are the standards for development and design critical to the long-term health of the River, but the processes governing the exchange of information between local authorities, applicants and the general public can make the difference between an application that successfully mitigates impacts to the River and one that ignores them. The key elements that were evaluated a means to support the development review process are:

- Pre-application meetings;
- Development application checklist; and
- Schedule of fees relating to development review.

Pre-application meetings:

A number of SRW communities use informal pre-application meetings as a means to open lines of communication with applicants early in the development review process. Communities such as Bolton and Colchester use scheduled, routine meetings in which municipal staff meet with potential applicants and discuss future development plans. These meetings are open opportunities for applicants and their professional representatives to discuss their plans in an informal setting to gain a better understanding of areas where their plans my need adjustment before beginning the formal submission process. The Town of Marlborough has the most formalized pre-application procedure with written guidelines on what pre-application meetings shall entail and areas of the regulations with which developers should be familiar when submitting a plan. Marlborough's Pre-Application Procedures are provided within Appendix C of this report.

Development application checklist:

Development application checklists serve an important role in terms of building plan review capacity. Checklists can clarify the process for applicants, thus increasing accuracy and timeliness of information and reducing wasted time for all parties involved. At least four SRW communities have one or multiple formal development application checklists: Bolton, Columbia, East Haddam, and Herbon. These checklists are provided for further review in Appendix D of this report.

With regard to the SRW, there are several pieces of information that can be added to development checklists that will enhance the capacity of local authorities to measure potential impacts to the resource. Where applicable, these include:

- Identify whether property is located within the Salmon River Watershed;
- Describe function of existing buffer zones (e.g. passive recreation, flood zone, bordering wetland habitat, etc.);
- Describe condition of existing buffer zones (e.g. heavily disturbed, mature forest, predominance of invasive species, etc.);
- Identify the presence of untreated stormwater discharges to the river (pipe or over-land);
- Show a map of slopes leading to the river; and
- Identify the "order" of the nearest receiving stream (i.e., first order, second order, etc.).

Schedule of fees relating to development review:

It is important that municipalities have a clear, fair and adequate fee structure to support the use of municipal resources in review development plans. Examples of SRW municipal fee structures are provided in Appendix E.

Forestry Regulations

Forestry regulations are intended to protect forest lands from improper harvesting practices and to ensure that the resource is managed in a sustainable fashion. Clear cutting and temporary road and skid construction can expose soils to erosion, reduce shade canopy along riparian buffers, and encroach on wetlands ultimately contributing to thermal and habitat impacts on cool- and cold-water streams. Under CGS § 23-65j, DEP is authorized to establish certification standards for loggers and foresters and adopt regulations to ensure BMPs are implemented during clearing, logging, and post-harvesting forest practices specifically to "afford protection to and improvement of air and water quality" on undeveloped forest parcels >1 acre. In 2007, DEP issued a Field Guide to Best Management Practices for Water Quality While Harvesting Forest Products. The field guide is intended to educate practitioners, landowners and municipal officials on the minimum standards for BMPs associated with the harvest of forest products to minimize water quality impacts. Some of the BMPs recommended for forestry activities to minimize sediment load and temperature increases that are critical for cool- and cold-water stream habitat protection include:

- Preparation of an operational/harvest plan that accounts for topography, soil, prevailing weather conditions, and location of sensitive aquatic resources and existing roads in advance of initiating clearing and harvesting activities. These plans should include provisions for erosion and sediment control practices.
- Minimize number of new landings (cleared areas where loading and transfer takes place) and use existing clearings where feasible. Locate landings away from drainage ways, streams, and wetlands. Construct roads and skid trails after landing locations have been established. Use stabilized construction entrances/gravel pads to minimize tracking of sediment off-site.
- Minimize the number of stream crossings by identifying crossing locations prior to road layout. Stream crossings should be constructed at 90 degrees from the direction of flow, in low gradient areas, and where the stream is straight (not at a bend or curve which is subject to erosion). Temporary crossings that can be easily removed with minimal disturbance to stream are preferred. Crossing approaches should be stabilized with stone, slash, or other materials to prevent sediment erosion. All culverts should be kept clear of debris. The 2007 Field Guide states that "local Inland Wetlands Agency must be contacted to determine if the stream crossing is permitted as a right or if a permit is required."
- Locate roads and trails (both truck and skid roads) to minimize the length of exposed area and amount of cut and fill; easily divert runoff; and avoid unstable or steep slopes. It is important to provide adequate buffer between roads and streams, ponds, lakes, vernal pools, and wetlands. Utilize design features such as water bars, broad-based dips, cross drains, and up-turns to minimize runoff volume and velocities from road surfaces and roadside ditches.
- Maintain a vegetated buffer strip around streams and wetlands where clearing and heavy equipment are prohibited (except for crossings). The 2007 Field Guide recommends protecting 50-foot around vernal pools at a minimum. If the buffer must be disturbed, activities should be scheduled when the ground is frozen or snow

covered to minimize disturbance of leaf litter and soils. The guide recommends maintaining a minimum of 50 percent crown cover to minimize increases in stream water temperatures. Runoff from skid trails and roads should be managed to prevent sediment from entering the buffer zones where feasible.

- Minimize clearing on steep, erodible slopes.
- Employ erosion and sediment control practices (stabilized construction entrances, silt fences, hay bales, erosion control blankets, etc.) to prevent erosion in disturbed areas, and to keep sediment out of streams, wetlands, and public roads. Temporary roads, skids, and landings should be stabilized (preferably seeded) and blocked off at end of activities. Use soil stabilization practices on exposed soil at stream crossings.
- Reforest disturbed areas as soon as harvesting in that area is completed (don't wait until end of entire operation), at a minimum, in areas susceptible to erosion and/or serving as aquatic buffers.

Many but not all forestry activities in wetlands and watercourses are permitted "as of right" and are not regulated activities. Due to statutory limitations (per CGS § 23-65k), municipalities without existing forestry regulations prior to January 1, 1998 cannot legally adopt new local forestry regulations. East Hampton, Haddam, and Glastonbury have existing municipal forestry regulations and have authority through local Inland Wetland Commissions to determine if activities are regulated or non-regulated. The best model for Forestry within the SRW communities is found within the Town of East Hampton. This model requires a special permit be obtained to conduct timber harvesting unless disturbing less than ¾ acres or part of an approved site plan. The special permit is only valid for one year and renewals require a report showing me asures taken to operate in a sustainable and environmentally friendly fashion.

Recommendations of the Connecticut Statewide Forest Resource Plan 2004-2013 call for expanding forestry BMPs recommended by DEP and unifying state requirements, which may provide an opportunity to develop practices and standards geared specifically to protect cold-water fisheries. Table 13 on the following page provides recommendations for the communities in the SRW for reducing the impact of forestry activities on sensitive cool- and cold-water streams.

Table 13. Summary of Recommendations for Forestry Activities to Minimize Impact on Cool- and Cold-Water Stream Habitat

Issue	Recommendation
For communities with local forestry regulations (East Haddam, Haddam, and Glastonbury)	• Ensure that local regulations contain application criteria that require a suitable amount of information for the review board to make a sound determination. Application requirements should request information such as: the extent and intensity of the use, wildlife considerations, and operational considerations such as machinery used and wetland crossings. • Educate review agency members on the issues of healthy forest management to provide for credible reviews of applications.
For communities without local forestry regulations	• Improve communication with DEP on ensuring proper BMP implementation, particularly in areas adjacent to streams. • Explore with DEP the potential to establish or adopt a multi-jurisdictional (regional) set of standards for forestry in the SRW.

Land Clearing Provisions

Within the SRW, the regulatory tool that is primarily responsible for regulating the clearing and grading of land is the Erosion and Sedimentation Control (ESC) standards. Preventing rampant clearing of land as well as loading of sediment from construction activities is critical to protecting cold water streams. To ensure water resource protection, many communities within these sensitive resources require ESC Plans for activities disturbing less than the one acre federal threshold. The large majority of SRW communities have a disturbance threshold of 0.5 acre. In most of the towns audited, individual single family lots are exempted from this standard regardless of area disturbed. We recommend revisiting this exemption to the extent allowable under state law to ensure that single lot development, redevelopment, or infill is not a potential source of sedimentation.

The 2002 CT Guidelines for Soil Erosion and Sediment Control is cited as the technical manual by most of the communities for the purposes of establishing standards. East Hampton has specifically called out limited clearing and grading as one of their Water Quality Protection Strategies and as requirements within the special Lake Pocotopaug Protective Area. Limits on clearing are critical to protecting native vegetation and soil conditions that provide stormwater interception and infiltration capacity. Where Salmon River Protection Areas or Overlays exist, we recommend inserting specific language to support adherence to ESC standards. Depending on the local capacity to review, inspect, and enforce the local ESC programs, we recommend the following measures for construction activities within the SRW:

- Require a pre-construction meeting on-site with contractor, engineer, and plan reviewer to ensure effective implementation of ESC plan.
- Require operations and routine maintenance plan as part of ESC plan.
- Increase frequency of site inspections (every 14 days and/or after every rain event) and critical periods (i.e. ensure practices are properly installed prior to significant land clearing activities, practice removal does not occur until site is permanently stabilized).
- Increased enforcement of temporary and permanent stabilization, particularly during sensitive trout spawning periods.
- Require adequate performance bonds to ensure ESC practices remain functional throughout the entire construction process.
- Establish requirements for phased clearing and soil compaction, and recommend limiting mass grading operations so disturbed area for any phase is limited to a maximum of 5 acres, unless a hardship can be demonstrated by an applicant and approved by the local authority.
- Consider requiring contractor/project manager training (see CT Construction Industries Association ESC training) for projects within the watershed.

Parking Regulations

Mounting research from state and federal agencies continues to link auto-dependant patterns of development to negative impacts on the quality of the natural environment. Within this research, parking regulations have been identified as playing a critical role in driving the site design process (EPA, 2006). Parking regulations can have a profound impact in establishing the overarching patterns of growth as well as the amount and quality of stormwater runoff. Municipalities must strive to achieve a balance between accommodating parking demand while also supporting a walkable, compact environment that limits impervious surface coverage. Innovative parking regulations can play a significant role in achieving several smart growth principles such as: reducing development costs, creating more walkable environments, improving the quality of stormwater runoff, and decreasing development pressure on valuable open space. Addressing parking standards, particularly for the centrally located SRW communities that have a large majority of their land within the watershed, is a critical component to supporting a healthy surface water system.

As illustrated in the Preliminary Municipal Audits in Appendix B, there is a wide variety of parking regulations within the nine participating SRW communities. Currently, many of these communities exhibit antiquated parking standards that result in an overabundance of parking at the costs of community character, loss of recharge to aquifer systems, and more polluted runoff. Changes to parking regulations can play a significant role in protecting surface water quality through minimizing impervious surface coverage, improving stormwater management, and encouraging redevelopment as opposed to new development. There are a variety of parking strategies that communities can utilize that address these issues by emphasizing parking efficiency over supply. Those covered in this report include:

- Tailoring parking ratios;
- Shared parking;
- Off-site parking allowances;
- Parking lot landscaping; and
- Use of pervious pavements.

Tailoring parking ratios:

The most direct way for communities to control the supply of parking is by tailoring local zoning regulations to more accurately reflect local parking demand and circumstances. Rather than imposing inflexible requirements that result in more impervious surface coverage than necessary, local zoning ordinances should look to incorporate mechanisms that tailor parking requirements to specific development projects. Currently only three of the SRW communities, Colchester, East Haddam, and Marlborough, have language with their regulations that allow for significant flexibility in determining parking requirements. East Haddam provides a range of potential values for the parking ratios while Colchester and Marlborough explicitly grant their Commissions the ability to reduce the parking requirements if deemed appropriate. Allowing for a healthy degree of flexibility is

critical to achieving maximum parking efficiency and limiting unnecessary impervious surface coverage.

Communities should consider incorporating guidelines for the elements it will review when considering reductions to parking ratios. Reductions could be allowed for factors such as: mixed-land uses, access to alternative transportation, demographics, and utilization of Transportation Demand Management (TDM) Programs including subsidized mass transit and parking cash out programs. Such reductions could fluctuate depending on the conditions around the site so the best approach is to allow flexibility within the regulations and subsequently require the developer to demonstrate the appropriate amount of parking needed.

When tailoring parking standards, it is wise to concurrently require a maximum parking requirement that restricts the total number of spaces allowed at a development site. Only one SWR community, East Haddam, currently implements a parking maximum. Communities may wish to consider the values that East Haddam has established for its parking maximum. Another potential strategy for setting a maximum parking requirement is for each community to use its current minimum parking ratio as the new maximum requirement. In this case, the municipality should also determine a lower value that will become the new minimum requirement, thus providing applicants with a range of parking values. Current minimums can be used as a viable number for a maximum requirement as a large majority of current minimum requirements are based on the extremely conservative estimates provided by the Institute of Transportation Engineers (ITE). Recent examination of the ITE parking rates shows that they were derived from a small number of studies located in suburban environments with high car dependency (Shoup, 2005). The broad application of ITE standards to cities and towns as a minimum requirement often handcuffs developers and municipalities and results in a surplus of parking that is only necessary during, for example, the winter holiday season.

Before making any sweeping changes to parking requirements, communities should carefully examine each requirement and assess the implications for reductions within the local context. The general approach of providing a firm maximum and an adjustable or low minimum gives developers flexibility to achieve innovative site designs while protecting the community from over- or under-supply.

Shared parking:

Since most parking spaces are only used part time, shared parking arrangements are designed to more efficiently meet the needs of areas that exhibit a mix of uses with varying peak parking demands. For example, many businesses or government offices experience their peak business hours during the daytime on weekdays, while restaurants and bars peak in the evening hours and on weekends. This presents an opportunity for shared parking arrangements where several different groups can use an individual parking lot without creating conflicts between their peak usage times. Currently, three SWR communities, East Haddam, Hebron, and Glastonbury, allow for shared parking within their regulations. Each community has established a different value, or “cap”, that

the total amount of parking can be reduced by if the applicant's analysis shows significant variation in peak parking demands. Hebron allows for a reduction of 25% in total parking, Glastonbury allows for a 30% reduction, and East Haddam, the most progressive of the three, allows for a range of 30-75% reduction in parking.

There is a limited amount of analysis needed to determine the appropriate amount of parking that should be reduced under shared parking arrangements. Table 14 provides an example of a shared parking analysis based on two uses (office and retail) and five different time periods. One strategy for allowing for shared parking without requiring significant amendments to the regulations is to allow applicants to submit their own analysis showing the peak parking demands that will occur at different times within a proposed development to determine the appropriate number of spaces.

Table 14: Example Shared Parking Analysis (Montgomery County, Maryland)

	OFFICE USE			RETAIL USE			
	Minimum Parking Requirement	Percentage of Parking Requirement	**Adjusted Parking Requirement**	Minimum Parking Requirement	Percentage of Parking Requirement	**Adjusted Parking Requirement**	**Parking Requirement by Time Period**
Weekday Daytime	210	100%	**210**	500	60%	**300**	**510**
Weekday Evening	210	10%	**21**	500	90%	**450**	**471**
Weekend Daytime	210	10%	**21**	500	100%	**500**	**521**
Weekend Evening	210	5%	**10.5**	500	70%	**350**	**360.5**
Nighttime	210	5%	**10.5**	500	5%	**25**	**35.5**

Off-Site parking allowances:

An integral piece to providing adequate flexibility within parking regulations involves allowing off-street parking requirements to be met through off-site facilities. These off-site allowances are particularly important in redevelopment sites and compact mixed-use centers where lot geometry and pre-existing development patterns can make it impossible for existing structures to comply with conventional on-site parking demands. Allowing business owners to negotiate with each other across property boundaries encourages a more integrated private sector approach and a much more efficient use of land. Recommended zoning provisions for off-site parking include the following:

- Establishing a small set of design standards that require well-marked, safe pedestrian travel from the parking lot to the target site.
- Establishing a maximum distance that the parking lot may be from the target site. Typical values range from 350 – 1,000 feet (walking distance). Before settling on a value for this maximum distance, communities should use maps to get a sense of where existing parking lots are situated relative to other buildings. Unnecessarily strict maximum distances may provide barriers to quality redevelopment.

Finally, a condition of any approval should be a legally defensible agreement between property owners that guarantees access to the parking lot, outlines any shared maintenance agreements, and deals with issues of shared liability.

Parking lot landscaping:

Communities should explore measures to allow for greater flexibility within parking lot landscaping standards in cases where applicants are seeking to include LID techniques for managing stormwater. LID facilities such as open sections, vegetative swales, and bioretention basins exhibit unique design characteristics can be difficult to fit into a regimented landscaping formula. Currently, among the SWR communities, East Haddam and Hebron have achieved the highest degree on inclusion of LID standards into parking lot design. East Haddam in particular provides an excellent model for incorporating standards into local regulations. If a community does not wish to include the level of detail contained within Hebron or Haddam's regulations, a more basic approach to LID parking lot landscaping standards includes the following:

- Use of open section drainage to encourage sheet flow to open channels where pollutants are removed through infiltration and natural filtering prior to discharge.
- Use of vegetative swales to direct stormwater into shallow bioretention areas that temporarily detain the water to allow for partial infiltration while filtering the remaining stormwater before it is discharged into waterways.
- For parking lots of 10 or more spaces, require that 10% of parking lot area be dedicated to landscaped areas including stormwater practices as described herein.
- Mandate landscaping within parking areas that "breaks up" pavement at fixed intervals. It is important to provide relief from these frequencies when a developer wishes to use landscaping as part of stormwater management practices so that they can have the flexibility necessary to adequately site and design vegetated BMPs.

Local communities should carefully consider any changes to parking lot landscaping standards. The effective use of LID techniques not only reduces stormwater runoff, it can also reduce construction and maintenance costs by 25-30% compared to conventional gutter and pipe approaches. Further technical details on implementing LID techniques can be found with the Stormwater Management section of this report.

Another emerging issue regarding parking lots (and other impervious surfaces) deals specifically with thermal impacts. With all of the recent concern with impacts from heating and cooling systems and associated costs, considerable research has been performed on the thermal impacts from different surfacing materials. Although the general focus of this research has been to identify ways to reduce the "heat island" effect from roofs and parking lots, these studies should also be considered in the context of stormwater runoff. What data have shown, is that materials with a high solar reflectance index (SRI) absorb far less heat than those with a low SRI. The primary factor in determining the SRI is the color of the material. New black-top, for example can have a temperature that is approximately 40 degrees higher than that of lighter materials, such as

concrete. Where runoff is directed to surface waters through catch basin systems, these thermal impacts can be exacerbated through the use of conventional black-top asphalt treatments. Communities can therefore explore incorporating SRI values into their regulations for walkways, parking lots or even road way surfaces as a means to reducing thermal impacts. Draft standards under public review within the LEED Neighborhood Design (LEED-ND) program suggest minimum SRI values of 29 as reasonable for many rooftop and driving surfaces.

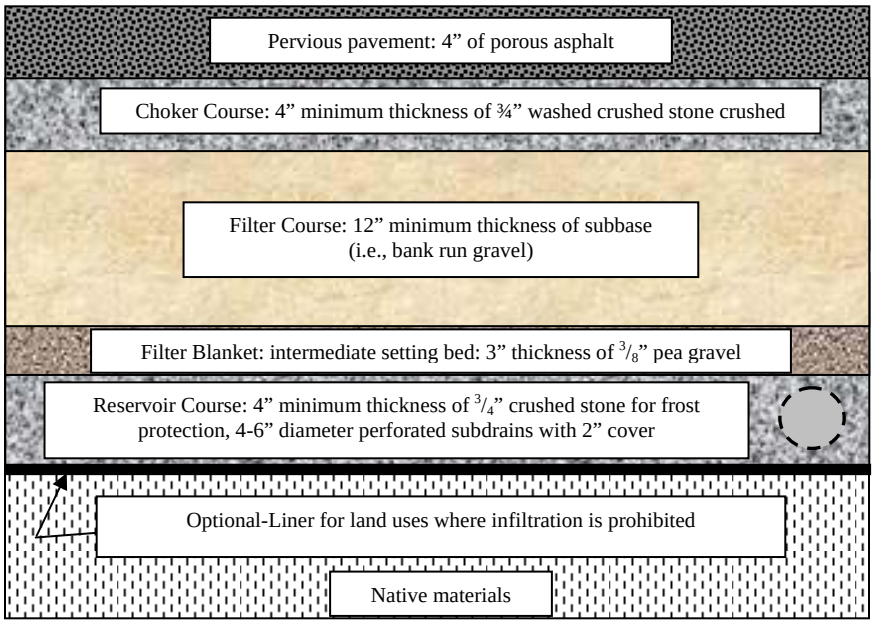
Use of pervious pavements:

Within cold weather climates such as Connecticut, a perceived challenge to implementing permeable pavements is the winter roadway maintenance needs that can damage or disrupt the performance of pervious materials. Currently there are no communities within the SRW that have specific regulation regarding the use of pervious pavements. Any future incorporation of permeable pavements in local regulations must come with the understanding that municipal-wide winter roadway maintenance standards may need to be amended or that specific areas with permeable pavements must receive specialized maintenance. Another challenge to encouraging pervious pavements is the question of increased cost. This challenge can be addressed through the proper selection of material. There are a variety of materials and types of permeable surfaces available and municipalities should research which material best fits their needs.

- Porous asphalt and pervious concrete: Although they appear to be the same as traditional asphalt or concrete pavement, they are mixed with a very low content of fine sand, so that they have 10%-25% void space and a runoff coefficient that is almost zero.
- Paving stones (also known as unit pavers): These stones are impermeable blocks made of brick, stone, or concrete, set on a prepared sand base. The joints between the blocks are filled with sand or stone dust to allow water to percolate to the subsurface. Runoff coefficients range from 0.1 – 0.7, depending on rainfall intensity, joint width, and materials. Some concrete paving stones have an open cell design to increase permeability.
- Grass pavers (also known as turf blocks): These are a type of open-cell unit paver in which the cells are filled with soil and planted with turf. The pavers, made of concrete or synthetic material, distribute the weight of traffic and prevent compression of the underlying soil. Runoff coefficients are similar to grass, 0.15 to 0.6.

Each of these products is constructed over a base course that doubles as a reservoir for the stormwater before it infiltrates into the subsoil (Figure 5).

Figure 5: Typical Cross-section of Porous Asphalt (UNHSC, 2008)



In term of site design criteria, alternative paving surfaces are best used in low traffic areas such as overflow parking, residential driveways, sidewalks, plazas and courtyard areas. Areas with high amounts of sediment particles and high traffic volumes may cause system failures. Do not construct adjacent to areas subject to significant wind erosion. Contributing drainage areas should be minimal (runoff from upgradient impermeable or permeable surfaces should be minimal). Typically, reservoirs consist of uniformly sized washed crushed stone, with a depth sufficient to store all of the rainfall from the design storm. Some designs incorporate an "overflow edge," which is a trench surrounding the edge of the pavement. The trench connects to the stone reservoir below the surface of the pavement and acts as a backup in case the surface clogs.

There are several maintenance practices that should be considered when allowing for permeable paving surfaces. A legally binding and enforceable maintenance agreement shall be executed between the facility owner and the responsible authority. The ESC Plan for the site shall specify how sediment will be prevented from entering the pavement area, the construction sequence, drainage management, and vegetative stabilization. The following list of BMPs in regard to maintenance of permeable pavers should be considered before implementing regulations:

- Alternative paving surfaces require regular vacuum sweeping or hosing (minimum every three months or as recommended by manufacturer) to keep the surface from clogging. Maintenance frequency needs may be more or less depending on the traffic volume at the site.
- Minimize use of sand and salt in winter months.

- Keep adjacent landscape areas well maintained and stabilized (erosion gullying quickly corrected).
- Post signs identifying permeable pavement.
- Grass pavers need mowing and often need reseeding of bare areas.
- For paving stones/bricks, periodically add joint material (e.g., sand) to replace material that has been transported.
- Attach rollers to the bottoms of snowplows to prevent them from catching on the edges of grass pavers and some paving stones.

Table 15. Summary of Key Parking Recommendations

Issue	**Recommendation**
Tailoring parking ratios	Incorporate flexibility for adjusting minimum requirements based on local conditions. Require a maximum parking requirement that is potentially based on current minimum requirement.
Shared parking	Allow for shared parking provisions. Provide at least 30% potential reduction in parking requirements based on shared parking analysis.
Off-Site parking allowances	Allow for off-site parking. Evaluate potential maximum off-site distance requirements and require safe pedestrian pathways.
Parking lot landscaping	Allow for flexibility within landscaping standards to achieve LID goals. Specifically allow use of open section drainage, vegetative swales, and bioretention areas. For lots over 10 spaces, require that at least 10% of parking lot areas area be dedicated to landscaped areas including stormwater practices.
Use of pervious pavements	Evaluate municipal winter roadway maintenance and ESC standards for feasibility of incorporating pervious pavements. Evaluate various pervious pavement material and design options to determine appropriate fit.

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APPENDIX A

The Nature Conservancy (TNC) Buildout Analysis Methods

APPENDIX A: SALMON RIVER WATERSHED BUILDOUT ANALYSIS METHODS

Build-Out

1. Used the Community Build-Out Analysis Tool from U. of Vermont to perform the calculations of the new buildings
2. Calculated the build-out only for residential zones
3. Commercial, industrial, business zones assumed to be fully developed at build-out
4. Used a 100' buffer of all streams, water bodies, and wetlands as restricted areas in all towns
5. Restricted development on all areas with >20% slope as calculated from the 30 meter digital elevation model (DEM)
6. Restricted development on all areas identified as open space using the 2008 data compiled for the TNC regional managed lands database
7. Used common set-back and building separation units for all towns
8. Used J. Parent's 2004 building footprints, augmented by additional current building points prepared by K. Geisler, for current buildings
   One problem with the 2004 building footprints is that Jason digitized all buildings, not just residences. This may overstate current residences and understate new residences somewhat. This is only a problem on larger parcels that may be able to be sub-divided into additional lots.
9. Did not use density shifting which reduces the number of new units placed on lots.

Impervious Surface (IS)

1. Used the Impervious Surface Analysis Tool (ISAT) from NOAA/UCONN NEMO
2. Used the 2002 Land Cover from UCONN/CLEAR and the corresponding impervious coefficients
3. Buffered each new house with a ¼ acre area to represent developed area
4. For the build-out IS, used the ¼ acre buffer to convert the existing land cover to developed
5. Assumed all Commercial, Industrial, Business zone areas to be developed and changed the existing land cover to developed for those areas
6. Used the calculated coefficients based on the 2000 census population density

6/11/2009

APPENDIX B

Preliminary Municipal Audits

Salmon River Watershed
Preliminary Municipal Audit for the Town of Bolton

The following Preliminary Audits were developed as part of The Nature Conservancy's (TNC's) ongoing Salmon River Watershed (SRW) Community Assessment project by Horsley Witten Group, Inc. (HW). This document is designed to identify key policy and regulatory issues related to the Salmon River as an existing cold-water trout stream resource. HW developed this document in anticipation of one-on-one interviews with local municipal agents during which these issues will be explored in greater detail. Overall, the goal of the project is to identify municipal policies, regulations, and practices that potentially have an impact on the Salmon River from a "resource protection" perspective. Issues relative to potential water quality impacts, stream buffer specifications, innovative site design, stormwater management, and several others were targeted in this early audit phase and will serve as the basis for expanding investigations as the project progresses. The following three documents were reviewed as part of this Preliminary Audit:

1. The Zoning Regulations;
2. The Subdivision Regulations; and
3. The Inland Wetlands and Watercourses Regulations.

The observations noted in this document are designed to guide discussions with local officials and will eventually lead to a more "guidance-oriented" document that will identify general and specific recommendations for consideration. It should be noted that these three documents do not represent the limit of local issues that will be examined as part of TNC's project. HW will also explore issues of permit review capacity, enforcement, and other housekeeping practices (e.g., snow removal and storm drain maintenance) with municipal officials over the course of the study.

Bolton Zoning Regulations Audit

- *Salmon River Watershed mentioned*
  - No

- *Districts that occupy the largest percentage of SRW*
  - Residence R-1 Zone [Section 6] occupies approximately 90% of Town land within SRW
    - Notable By-Right Uses: Single and Two Family Housing, Accessory Apartments, institutional uses, stabling of horses, keeping livestock, day care.
    - Notable Special Permit Uses: continuing care retirement communities, Open Space Subdivision.

- *Riparian Overlay Zone*
  - No

- *Open Space Design*
    - Open Space Conservation Development (OSCD)- Section 7
        - Optional for developers.
        - Applicable for subdivisions over 10 acres.
        - Open space required: 40%
        - Lot density is calculated by multiplying total square footage of parcel by 0.75, then dividing by the traditional minimum lot area for residential zone. The resulting number equals the number of lots that can be created.
        - Net buildable area is considered.
        - Can include multiple dwelling complexes.
        - Design flexibility is allowed. See lot regulations below.
        - Management of Open Space is enforceable

- *Lot Regulations- Section 11*
    - Minimum lot area requirements:
        - 40,000 sq. ft. per lot in R-1.
        - 24,000 sq. ft. for R-1 with OSCD.
    - Minimum setbacks:
        - Front Yard:
            - 35 feet in R-1.
            - 30 feet in R-1 with OSCD.
        - Side Yard:
            - 25feet in R-1.
            - 20 feet in R-1 with OSCD.
        - Rear Yard:
            - 40 feet in R-1
            - 35 feet in R-1 with OSCD
        - Maximum building coverage:
            - 15% in R-1.
        - Maximum impervious surface coverage:
            - 20% in R-1.

- *Parking requirements- Section 15N*
    - Parking Ratios:
        - Residential: 2 spaces per unit.
        - Retail: 5 spaces per 1,000 sq. ft.
        - Office: 5 spaces per 1,000 sq. ft.
        - Restaurant: 1 space per 3 seats.
    - No allowances for shared parking.
    - No allowances for pervious parking spillover lots.
    - No parking maximum limit
    - Minimum of 20 sq. ft. of landscaping for every parking space for lot over 10 spaces

- *Earth Removal Requirements- Section 12*
    - Applicability:
        - Does not include activities that have been issued a building permit.
        - Does not include activities that have NOT been issued a building permit under 600 cubic yards of earth for each lot.
    - Limited restoration standards.

- *Erosion and Sedimentation Control- Section 3A9*
    - Applicability:
        - Does not included activities in which less then 0.5 acres is disturbed.
        - Has a grade in excess of 10 percent.
    - Unclear standards.

Bolton Subdivision Audit

- *Roadway requirements- Section 11*
    - No language regarding streets aligning with topography.
    - No encouragement of through streets.
    - Roadway Design Criteria:
        - Minimum street width: 26 feet of pavement.
        - Right of way (local): not less than 50 feet
        - Grades: maximum 10% on local streets.

- *Driveway requirements- Section 11.12*
    - Pervious material is allowed.
    - Common driveways are only allowed with Commission's discretion.
    - Driveway width in low-density residential.
        - 12 feet minimum.
    - Driveway grade requirements.
        - Not to exceed 15%.
        - Grades over 10% must be paved.

- *Cul-de-sac requirements- Section 11.8*
    - Language allowing road rights of way shall extend into adjoining properties for potential future expansion.
    - Service area: not more than 20 lots.
    - Cul-de-sac dimensions:
        - Maximum length: not specified.
        - Width: 25 feet of pavement.
        - Minimum turnaround radius- 50 feet of pavement.

- *Sidewalk Construction- Section 11*
    - Commission given discretion to require sidewalks.

- *Stormwater management- Section 12.1*
    - References 2004 DEM Stormwater Manual.
    - Peak flow post-development shall not exceed peak flow pre-development.
    - Drainage swales, ditches, and channels shall be designed to convey the maximum flows computed without erosion or overtopping.

- *Erosion and sedimentation control plan- Section 14*
    - Required to meet CT Guidelines if over 0.5 acres.

- *Subdivision Open Space Requirements- Section 4*
    - Minimum require 20% of subdivision
    - Minimum required open space shall not include wetlands that exceed 1.5 times the percentage of wetland areas of the entire parcel.
    - Fee-in-lieu of open space available with Commission's approval.

Bolton Inland Wetlands and Watercourse Audit

- *Last Update: 2006*

- *Upland Review Area- Section 3*
  - 100 feet for wetlands and watercourses.
  - 50 feet boundary for buildings or structures (Zoning Regulations 3.A.7).

- *Special Area of review for Salmon River:*
  - No

- *Overarching Issue for all Communities*
  - Need to have a discussion with local regulatory authority regarding how effective the application process is. Are the criteria specific enough? Is the information in the application requirements adequate to make the determinations?

Salmon River Watershed
Preliminary Municipal Audit for the Town of Colchester

The following Preliminary Audits were developed as part of The Nature Conservancy's (TNC's) ongoing Salmon River Watershed (SRW) Community Assessment project by Horsley Witten Group, Inc. (HW). This document is designed to identify key policy and regulatory issues related to the Salmon River as an existing cold-water trout stream resource. HW developed this document in anticipation of one-on-one interviews with local municipal agents during which these issues will be explored in greater detail. Overall, the goal of the project is to identify municipal policies, regulations, and practices that potentially have an impact on the Salmon River from a "resource protection" perspective. Issues relative to potential water quality impacts, stream buffer specifications, innovative site design, stormwater management, and several others were targeted in this early audit phase and will serve as the basis for expanding investigations as the project progresses. The following four documents were reviewed as part of this Preliminary Audit:

1. The local Plan of Conservation and Development;
2. The Zoning Regulations;
3. The Subdivision Regulations; and
4. The Inland Wetlands and Watercourses Regulations.

The observations noted in this document are designed to guide discussions with local officials and will eventually lead to a more "guidance-oriented" document that will identify general and specific recommendations for consideration. It should be noted that these four documents do not represent the limit of local issues that will be examined as part of TNC's project. HW will also explore issues of permit review capacity, enforcement, and other housekeeping practices (e.g., snow removal and storm drain maintenance) with municipal officials over the course of the study.

Colchester Plan of Conservation and Development Audit

- *Last Update: 2001*

- *Land Use Profile (1998, page 16)*
  - 54% Vacant/Potentially Developable
  - 23% Single Family
  - 15% Protected Open Space
  - < 2% Commercial
  - < 1% Industrial
  - < 1% Mixed Use

- *Natural Resources- Section 5*
  - Objective 2: Review current aquifer protection zone regulations on regular basis to ensure highest level of protection.

- Objective 4: Adopt a residential fuel tank ordinance to replace underground fuel tanks older than 20 years old.
- Objective 5: Continue to acquire land around aquifers in order to aid their protection.
- Objective 8: Continue to require appropriate buffer zones for important water resources.

- *Open Space- Section 6*
  - Objective 3: Increase the percentage of open space preserved as part of new subdivisions.
  - Objective 8: Tie both existing and new open space and recreation areas together into an integrated greenbelt or buffer system.

- *Housing and Residential Areas- Section 9*
  - Several pages of material are dedicated to Open Space Subdivision Design with schematics and possible regulatory language:
    - Plan recommends a minimum of 20% open space requirement while zoning regulations state 15%.
  - Objective 2: Modify residential zones, where desirable, to protect water quality and water supplies.

Colchester Zoning Regulations Audit

- *Salmon River Watershed mentioned*
  - No

- *Districts that occupy the largest percentage of SRW*
  - R-60 Rural Residential District and R-80 Rural Residential District [Sections 4A and 4J] occupy approximately 80% of Town land within SRW.
    - Notable by-right uses: single-family detached dwelling, accessory buildings and uses (but not Accessory apartments).
    - Notable special exception uses: Accessory Apartments, county clubs, golf course (only in R-60), excavation (only in R-60), Residential Development Flexibility for Open Space Preservation, and Residential Development Flexibility for Housing Diversity.

- *Groundwater Overlay Zone*
  - Section 6- Aquifer Protection Zone (APZ)
    - APZ consists of stratified drift aquifer and its primary and secondary recharge areas.
    - Prohibits traditional high polluting uses such as: landfills, non-domestic septic, road salt, etc.
    - All uses by special exception only.

- *Riparian Overlay Zone*
  - No

- *Village Center Zone*
  - R-30A Special Urban Residential District, C General Commercial District, and HPOZ Historic Preservation Overlay Zone [Section 4D, 4F, and 5]
    - R-30A Special Urban Residential District:
      - Notable by-right uses: multi-family, small scale retail, small scale business, and restaurants.
      - Notable special exception uses: mixed-use development or multi-family in existing building.
    - C General Commercial District
      - Notable by-right uses: retail, business, restaurant, theaters, personal services, truck rental, etc.
      - Notable special exception uses: gas station, auto repair shop, hotel/motel, excavations, hospital, drive-through restaurants.

    - HPOZ Historic Preservation Overlay Zone

- Contains small portion of centrally located C District and all of R-30A District.
- Disallows multifamily dwellings unless it is a rehabilitation of an existing structure.
- Zoning and Planning Commission is given discretion on setbacks, minimum lot size, building coverage, and impervious coverage.
- Architectural guidelines.
- Reduced parking requirements by ~10%. Can be reduced by ~20% if applicant can demonstrate different peak usage, shared trips with other uses, or off-site/off-street public parking within 500 feet.

- *Open Space Design*
  - Residential Development Flexibility for Open Space Preservation and Residential Development Flexibility for Housing Diversity [Section 4K and 4L]
    - Optional to developers
    - Unclear when this applicable in terms of acreage or number of units in subdivision.
    - Open space required:
      - Standard Subdivision: 10%
      - Open Space: >15% with incentive if more included.
    - Includes creative density incentives
    - Net buildable area is considered
    - Design flexibility is allowed in the form of Planned Residential Developments (PRD) and other dimensional flexibility.
    - Management of Open Space is enforceable

- *Other flexible multi-family or mixed-use development tool*
  - Business Park District (BP) and Planned Residential Development (PRD) [Section 4M and 11.19]
  - Business Park District (BP):
    - While geographically located on periphery of village core, the BP contains the most viable regulations for higher density, mixed-use, coordinated developments.
    - Notable by-right uses: business offices, medical laboratories, and research facilities.
    - Notable special exception uses: retail, restaurants, hotel, light manufacturing, and multi-family residential strictly within mixed use context of no more than 75 units on a parcel provided specific criteria are satisfied.
    - Maximum of 400 residential units have been allocated for the entire business park district.
    - Criteria for allowing mixed use multi-family housing:

        - Minimum land area of 15 acres.
        - Minimum 30% percent of residential buildings must contain non residential uses.
        - Minimum 50,000 sq. ft. of non-residential in total development.
        - Minimum 20% affordable units.
        - Residential density shall not exceed 7 dwellings per buildable acre.
    - Shared parking allowances.
    - Design guidelines included.
- Planned Residential Development (PRD):
    - Only permitted within water/sewer service area.
    - Cannot exceed maximum density or building coverage permitted within each zoning district.
    - No clear relief or flexibility given regarding dimensional or use regulations.

- *Lot Regulations- Section 4A-4M*
    - In R-80 and R-60, no lot shall have more than one principal building. (Section 13.2)
    - In R-30 and R-30A a lot may contain multiple principal dwellings. (Section 13.2)
    - Minimum lot area requirements:
        - ~2 acres per lot in R-80.
        - ~1.5 acres per lot in R-60.
        - ¾ acres per lot in R-30A.
        - 40,000 sq.ft. per lot in C (General Commercial).
    - Minimum setbacks:
        - Front Yard:
            - 75-50 feet in R-60.
            - 100-50 feet in R-80.
            - 15 feet in R-30A and C.
        - Side Yard:
            - 25 feet in R-60/R-80.
            - 25 feet in R-30A.
            - 0 feet for C when both lots are zoned Commercial.
        - Maximum building coverage:
            - 10% in R-60.
            - 7.5% in R-80.
            - 25% in R-30A.
            - 50% of the buildable area in C.
        - Maximum Residential Density:
            - 0.5 lots per acre of buildable area in R-60.
            - 0.35 lots per acre of buildable area in R-80.
            - 1 unit per acre of buildable land in R-30A.

        - Maximum impervious surface coverage:
            - None in R-60/R-80.
            - Up to Zoning and Planning Commission discretion in R-30A.
            - 75% of buildable area in C.
            - Commission given discretion to increase permitted impervious surface coverage for commercial or industrial uses to not more than 90% buildable area (Section 11.21).

- *Parking requirements- Section 15*
    - Parking Ratios:
        - Residential: 2 spaces per unit.
        - Retail: 6.7 spaces per 1,000 sq. ft.
        - Office: 5 spaces per 1,000 sq. ft.
        - Restaurant: 1 per 4 seats + 1 per employee max. shift + 1 per 50 sq. ft. of open floor area.
    - Can count on-street parking along frontage of lot towards parking requirements in Historic Preservation Overlay.
    - No shared parking allowances except in Business Park District and HPOZ.
    - No pervious parking allowances.
    - Commission determines maximum parking limit.
    - Zoning and Planning Commission may, under site plan review, reduce the number or size of spaces if the applicant can a demonstrate reduced need.
    - No clear minimum percentage of parking lot landscaped aside from requirement of one tree per 10 spaces if lot is over 50 spaces (Section 3.7.3.N.3).

- *Landscaping Requirements- Section 3.7.3.N*
    - All portions of lot not occupied by structures or paving must be landscaped unless not disturbed by development in which case land can be left in natural state.
    - Font yard landscaping requirement: 15 feet wide.
    - For parking lots of 50 spaces or more, one tree required for every 10 spaces.
    - No specific side/Rear yard landscaping requirement:
    - No specific mention of prohibiting non-native plant species- instead mention that materials shall be provided in accordance with good landscaping practice.
    - No mention of LID.

- *Earth Removal Requirements- Section 11.22*
    - Applicability:
        - Specifically intended for earth removal as a use.
        - Special Exception Permit only.
    - Limits amount of material processed to 80 cubic yards per hour.
    - Commission given discretion to limit the area of operation.

- Limited standards regarding reclaiming site.

- *Erosion and Sedimentation Control- Section 12.4*
  - Applicability:
    - Does not include activities in which less than 0.5 acres is disturbed.
    - Does not include single family dwelling that is not part of a subdivision.
  - E&S Plan design must be site-specific and enforced.
  - All standards are referenced from CT Guidelines for Erosion and Sediment Control.

- *Flood Hazard Overlay District- Section 7*
  - No new construction or substantial improvements allowed within Flood Hazard Boundaries except to existing structures destroyed or made inhabitable by natural disaster.

Colchester Subdivision Audit

- *Limitation on dwellings per lot- Section 13.2 of zoning regulations*
    - R-80 and R-60 shall not have more than one principal building.
    - In R-30 and R-30A a lot may contain multiple principal dwellings.
    - Flag lots explicitly permitted in a few zoning districts (for example R-30A and C (Zoning Section 4F and 4D) however a subdivision shall not have more than one flag lot or more than 10% of the total number of lots, whichever is greater.

- *Roadway requirements- Section 6.3.3*
    - Designs creating connected street network are encouraged as opposed to cul-de-sacs as further detailed within this audit below.
    - The Commission has the discretion to reduce roadway width requirements for "public supply watershed protection, groundwater protection, aquifer protection, and for wetlands and other environmental protection purposes."
    - A developer may be required to improve existing access streets if they do not meet current standards.
    - Roadway Design Criteria:
        - Minimum local and dead-end street width: 26 feet if street is less than 2,800 feet long, serve less than 40 lots, and geologic features, wetlands, and/or existing development preclude the likelihood of expanding a street network beyond 2,800 feet. Otherwise streets must have 30 feet paved width.
        - Right of way (local): 50 feet.
        - Grades: maximum 8%. Commission can increase grade up to 10% if grade will achieve better subdivision design through preservation of topographic features.

- *Driveway requirements- Section 13.10 and Zoning Regulations Section 3.7.3.D*
    - Pervious material is allowed as approved by Town Engineer and Zoning Commission.
    - Common driveways are promoted.
    - Driveway width:
        - 12 feet minimum
        - 30 feet maximum
    - Driveway grade requirements.
        - Not to exceed 1% within 30 feet extending from Town roadways.
        - Not to exceed 1% on street right-of-ways.
        - Not to exceed 15% at any point.
        - Grades greater than or equal to10% must be paved.

- *Cul-de-sac requirements- Section 6.3.3*
    - Encourage design of cul-de-sacs that have the ability to be extended into adjoining properties for potential future expansion. Permanent dead-end

cul-de-sacs shall be allowed if geologic features, wetlands, and/or existing development preclude the likelihood of expanding a street network beyond 2,800 feet.

- Service area:
  - Less than 10 lots for streets with 24 foot width and 800 foot length.
  - Less than 40 lots for streets with 26 foot width and 2,800 foot length.
- Cul-de-sac dimensions:
  - Maximum length: 1,800 feet. Can be 2,800 feet if for a temporary extension of through road.
  - Width: 26 feet. Can be 24 if the street is less than 800 feet and less than 10 lots served.
  - Minimum turnaround radius- 50 feet, island allowable.

- *Sidewalk Construction- Section 6.3.12*
  - Sidewalks required for all new subdivisions but Commission given discretion to waive requirements if it would not be beneficial to the subdivision.
  - Portland cement concrete mix (7.7.1).

- *Winter Storm Road Treatment & Maintenance*
  - Use of treated sand and sand/salt mix

- *Utility Placement- Section 13.5K*
  - Located within Right of Way beneath street, sidewalk, or planting strip.

- *Curbing- Section 7.6*
  - All streets shall be constructed with curbs.

- *Drainage- Section 7.5*
  - Limited info. Provides reference to Zoning Section 12.5.4.
  - References appurtenances such as culverts, catch basins, head-walls, storm sewers.
  - Details provided for appurtenances.
  - Plan required. Waiver can be granted if less than 1 acre disturbed and less than 10% impervious.

- *Septic systems- Section 6.2.6*
  - Approval 7 certification required from Town Health Official.

- *Subdivision open space requirements- Section 6.5*
  - Minimum require 10% of subdivision.
  - Commission may allow for open space requirement to be satisfied by land off the site.
  - Provisions for configuring open space such that it combines with adjoining open space or forms a larger unified open space on adjacent land.

- Open space, or a portion of it, may be waived if applicant provides some recreational improvements such as trails, playscapes, playing fields, etc.
- Applicant is responsible for management of open space.
- Fee-in-lieu of open space available with Commission's approval.

- *Street Trees- Section 6.8*
  - Efforts shall be devoted to preserving substantial existing vegetation in each subdivision.

Colchester Inland Wetlands and Watercourse Audit

- *Last Update: 2007*

- *Upland Review Area- Section 2*
  - 75 feet for wetlands.
  - 100 feet for high water line of watercourses.

- *Special Area of review for Salmon River*
  - No

- *Permitted Uses as of Right and Non-regulated uses- Section 4*
  - Farming
  - Residential home or subdivision approved before effective date of regulations.
  - Incidental residential landscaping
  - Recreational uses provided they do not disturb the wetland or watercourse.

- *Overarching Issue for all Communities*
  - Need to have a discussion with local regulatory authority regarding how effective the application process is. Are the criteria specific enough? Is the information in the application requirements adequate to make the determinations?

Salmon River Watershed
Preliminary Municipal Audit for the Town of Columbia

The following Preliminary Audits were developed as part of The Nature Conservancy's (TNC's) ongoing Salmon River Watershed (SRW) Community Assessment project by Horsley Witten Group, Inc. (HW). This document is designed to identify key policy and regulatory issues related to the Salmon River as an existing cold-water trout stream resource. HW developed this document in anticipation of one-on-one interviews with local municipal agents during which these issues will be explored in greater detail. Overall, the goal of the project is to identify municipal policies, regulations, and practices that potentially have an impact on the Salmon River from a "resource protection" perspective. Issues relative to potential water quality impacts, stream buffer specifications, innovative site design, stormwater management, and several others were targeted in this early audit phase and will serve as the basis for expanding investigations as the project progresses. The following three documents were reviewed as part of this Preliminary Audit:

1. The Zoning Regulations;
2. The Subdivision Regulations; and
3. The Inland Wetlands and Watercourses Regulations.

The observations noted in this document are designed to guide discussions with local officials and will eventually lead to a more "guidance-oriented" document that will identify general and specific recommendations for consideration. It should be noted that these three documents do not represent the limit of local issues that will be examined as part of TNC's project. HW will also explore issues of permit review capacity, enforcement, and other housekeeping practices (e.g., snow removal and storm drain maintenance) with municipal officials over the course of the study.

Columbia Zoning Regulations Audit

- *SRW Mentioned*
  - No

- *Districts that occupy the largest percentage of SRW*
  - Residential Agriculture (RA) [Sections 21] occupies approximately 100% of Town land within SRW.
    - Notable By-Right Uses: Single Family Housing, Accessory Living Unit, Renting of rooms, Avocational livestock, manure storage.
    - Notable Special Permit Uses: Commercial Horse operation, Earth Removal.

- *Groundwater Overlay Zone*
  - No

- *Other Protective Zones*
    - Columbia Lake Watershed Protection Overlay Zone
        - Not located within SRW.

- *Riparian Overlay Zone*
    - No

- *Open Space Design*
    - Cluster Design- Section 54
        - Optional to developers.
        - Special Permit required.
        - Applicable at >25 acres.
        - Open space requirement not specified.
        - No density incentives.
        - Must submit additional information if not on public water or sewer stating how cluster subdivision can function satisfactory.
        - Net buildable area is considered.
        - Design flexibility is allowed by up to 20% of lot coverage/bulk standards.
        - Management of Open Space is enforceable.

- *Lot Regulations- Section (page 15)*
    - Minimum lot area requirements:
        - 50,000 sq.ft. in RA.
        - 3.44 acres for rear lots in RA.
    - Minimum setbacks:
        - Front Yard:
            - 50 feet in RA.
        - Side Yard:
            - 25 feet in RA.
    - Maximum building coverage:
        - 10% in RA

- *Parking requirements- Section 61*
    - Parking Ratios:
        - Residential: 2 spaces per unit.
        - Retail: 6.7 spaces per 1,000 sq. ft. on first floor, 3.3 spaces per sq. ft. on second floor.
        - Office: 6.7 spaces per 1,000 sq. ft. on first floor, 3.3 spaces per sq. ft. on second floor.
        - Restaurant: 20 spaces per 1,000 sq. ft. of public floor area.
    - No allowances for shared parking.
    - No allowances for pervious parking spillover lots.
    - No parking maximum limit.
    - Minimum of 1 tree for every 30 spaces in parking lot located in landscaped islands or buffer strips.

- *Earth Removal Requirements- Section 63*
    - Applicability:
        - Does not include activities that have been issued a certificate of zoning compliance.
        - Does not include activities that have NOT been issued a certificate of zoning compliance under 100 cubic yards of earth for each lot.
    - Includes restoration standards.

- *Erosion and Sedimentation Control- Section 82*
    - Applicability:
        - Does not include activities in which less then 0.5 acres is disturbed.
        - Does not include single family dwelling that is not part of a subdivision.
    - E&S Plan design must be site-specific and enforced.
    - All standards are referenced from CT Guidelines for Erosion and Sediment Control.

Columbia Subdivision Audit

- *Conformance- Section 3.3*
    - The plan for subdivision shall conform to the Plan of Conservation and Development prepared by the Commission.

- *Roadway requirements- Section 6.2*
    - Design of "through streets" is encouraged as opposed to dead end streets. Commission given discretion to deny a subdivision based on unnecessary use of a dead end street.
    - Applicant shall dedicate rights of way at the terminus of temporary dead end streets for possible expansion into abutting property that is susceptible for subdivision development.
    - As far as practical, streets shall adapt to existing topography to limit cut and fill activities.
    - A developer may be required to improve existing access streets if they do not meet current standards.
    - Roadway Design Criteria:
        - Minimum street width: 24 feet of pavement- commission has discretion to reduce to 22 feet.
        - Right of way (local): not less than 50 feet
        - Grades:
            - Maximum 8% preferred on minor streets.
            - Absolute maximum of 12%.

- *Driveway requirements- Zoning Section 8.12*
    - Driveway design shall ensure that driveway runoff does not run into roadway or roadway runoff does not run into driveway.
    - Pervious material is allowed.
    - Common driveways are promoted.
    - Driveway width in low-density residential.
        - 12 feet minimum
    - Driveway grade requirements.
        - Not to exceed 15%.
        - Not to exceed 5% within first 20 feet from road.
        - Grades >10% must be paved.
        - Driveway side slopes shall not exceed a slope of three horizontal to one vertical (3:1) unless retaining walls or other stabilizing measures are provided.

- *Cul-de-sac requirements- Section 6.2.m*
    - Road rights of way shall extend into adjoining properties for potential future expansion.
    - Service area: not more then 15 lots.

    - Cul-de-sac dimensions:

        - Maximum length: 1,200 feet.
        - Width: 24 feet of pavement- commission has discretion to reduce to 22 feet.
        - Minimum turnaround radius- 45 feet of pavement, island allowable.

- *Utility Placement- Section 6.2.ee*
    - Located within Right of Way.

- *Watercourse crossings- Section 6.2.ff*
    - Where a major watercourse separates an existing street from abutting property to be subdivided, provisions shall be made for carrying such watercourse by means of culverts or other structures.

- *Stormwater Runoff Management- Section 6.3*
    - An applicant for any subdivision shall submit a hydrologic review if:
        - The development will involve the destruction or removal of vegetation or other ground cover and the exposure of soil materials on five acres or more.
        - The subdivision will involve the grading or filling of five (5) acres or more of land.
        - The proposed impervious portion of the total subdivision area is 25**%** or greater.
        - The Commission finds that a hydrologic review and summary is necessary to protect the public health, safety, or welfare of the Town.
    - Design of the stormwater management system shall consider reducing runoff by use of such techniques as minimizing impervious areas and maximizing travel times by using grass or rock-lined channels in lieu of storm sewers.
    - Drainage Design Criteria:
        - Roadway Stormwater Capacity: 10-year storm.

- *Subdivision open space requirements- Section 9*
    - Applicable to subdivisions over 10 acres.
    - Minimum requirement 15% of subdivision
    - Encourage location of open space in a manner that evaluates abutting property and surrounding open space.
    - Fee-in-lieu of open space available with Commission's approval.

Columbia Inland Wetlands and Watercourses Audit

- *Last Update: 2008*

- *Upland Review Area- Section 3*
    - At least 100 feet for any wetland or watercourse.
    - 200 feet for any wetland or watercourse listed in areas of special concern.
    - 200 feet for any wetland or watercourse if the slope is greater than 20%.
    - The Commission may rule that any other activity located within such upland review area or in any other non-wetland or non-watercourse area is likely to impact or affect wetlands or watercourses and is a regulated activity.

- *Special Area of Review for Salmon River*
    - Not specifically, but possibly additional review for tributaries as indicated in watercourses of special concern.

- *Overarching Issue for all Communities*
    - Need to have a discussion with local regulatory authority regarding how effective the application process is. Are the criteria specific enough? Is the information in the application requirements adequate to make the determinations?

Salmon River Watershed
Preliminary Municipal Audit for the Town of East Haddam

The following Preliminary Audits were developed as part of The Nature Conservancy's (TNC's) ongoing Salmon River Watershed (SRW) Community Assessment project by Horsley Witten Group, Inc. (HW). This document is designed to identify key policy and regulatory issues related to the Salmon River as an existing cold-water trout stream resource. HW developed this document in anticipation of one-on-one interviews with local municipal agents during which these issues will be explored in greater detail. Overall, the goal of the project is to identify municipal policies, regulations, and practices that potentially have an impact on the Salmon River from a "resource protection" perspective. Issues relative to potential water quality impacts, stream buffer specifications, innovative site design, stormwater management, and several others were targeted in this early audit phase and will serve as the basis for expanding investigations as the project progresses. The following three documents were reviewed as part of this Preliminary Audit:

1. The Zoning Regulations;
2. The Subdivision Regulations; and
3. The Inland Wetlands and Watercourses Regulations.

The observations noted in this document are designed to guide discussions with local officials and will eventually lead to a more "guidance-oriented" document that will identify general and specific recommendations for consideration. It should be noted that these three documents do not represent the limit of local issues that will be examined as part of TNC's project. HW will also explore issues of permit review capacity, enforcement, and other housekeeping practices (e.g., snow removal and storm drain maintenance) with municipal officials over the course of the study.

East Haddam Zoning Regulations Audit

- *Salmon River Watershed mentioned*
  - No

- *Districts that occupy the largest percentage of SRW*
  - Residence (R2) and (R4) [Section 9.2] occupy the largest (presumably- no map available) of Town land within SRW
    - Notable By-Right Uses: Single Family Housing, Two Family Housing, Accessory Apartments
    - Notable Special Exception Uses: Kennel, Vet Clinic, Bed and Breakfast.

- *Groundwater Overlay Zone*
  - No

- *Other Protective Zones*
    - Conservation Zone (Gateway) Section 9.9
        - No building or structure shall be constructed or extended within 100 feet of the Connecticut River or any of its tributaries or associated wetlands. At its discretion, the Town may reduce this setback if the structure is determined to have a functional need for locations nearer to water for operational necessity (e.g.: pier, dock, etc.)
        - There are standards to limit clear cutting within 50 feet of the Connecticut River or any of its tributaries or associated wetlands.

- *Riparian Overlay Zone*
    - Yes, Eightmile River Watershed Overlay District
        - Unclear if this included area within SRW; no map available.
        - 100 foot buffer from all watercourses identified in regulation (Salmon River not listed).
        - No disturbance zone except vegetative management.

- *Open Space Design*
    - Conservation Subdivision- Section 23
        - Required to present if at least 5 lots or 15 acres in R2/R4.
        - Open space required: 50%.
        - Minimum Lot Size:
            - 0.75 acres in R2.
            - 1 acre in R4.
        - Maximum Lot Size:
            - 1.25 acres in R2.
            - 1.5 acre in R4.
        - No density incentives.
        - Net buildable area is considered.
        - Design flexibility is allowed.
        - Management of Open Space is enforceable.

- *Other flexible multi-family or mixed-use development tool*
    - Planned Residential Unit Development- Section 17.4
        - Floating Zone.
        - Specifically for assisted living or adult living residential.
        - Maximum density: 3 bedrooms per acre.
    - Planned Residential Unit Development- Section 17.5
        - Floating Zone.
        - Special exception review set up for year round residential development.
        - Limitations on floor area of residential structures.
        - Minimum Lot Size:
            - 1 acre in R2.

        - 1.25 acres in R4.

- *Lot Regulations- Section 10*
    - Minimum lot area requirements:
        - 4 acres per lot in R4.
        - 2 acres per lot in R2.
        - 8 acres per lot for two-family in R4.
        - 4 acres per lot for two-family in R2.
    - Minimum setbacks:
        - Front Yard:
            - 40 feet in R4.
            - 40 feet in R2.
        - Side Yard:
            - 50 feet in R4.
            - 40 feet in R2.
        - Maximum building coverage:
            - 5% in R4.
            - 10% in R2.
        - Maximum impervious surface coverage:
            - 10% in R4.
            - 10% in R2.

- *Parking requirements- Section 11*
    - Parking Ratios:
        - Residential: 1 minimum, 2.5 maximum spaces per unit.
        - Retail: 2 minimum, 5 maximum spaces per 1,000 sq. ft.
        - Office: 2 minimum, 5 maximum spaces per 1,000 sq. ft.
        - Restaurant: 5 minimum, 12 maximum spaces per 1,000 sq. ft.
    - Allowances for shared parking- potential for 30-75% reduction
    - Allowances for pervious parking spillover lots
    - Includes parking maximum limit
    - Minimum of 15% landscaped areas required in parking lots.
    - Extensive Stormwater/Landscaping standards involving the CT Stormwater Manual Best Management Practices.

- *Landscaping Requirements*
    - Extensive requirements for parking lots- Section 11

- *Earth Removal Requirements- Section 19*
    - Applicability:
        - Does not include activities that have been issued a building permit.
        - Does not include activities that have NOT been issued a building permit and involve under 300 cubic yards of earth for each lot.
    - Includes restoration standards.

- *Erosion and Sedimentation Control- Section 14.A.2*
    - Applicability:
        - Does not include activities in which less then 0.5 acres are disturbed.
        - Does not include single family dwelling that is not part of a subdivision.
    - Erosion and Sedimentation Plan design must be site-specific and enforced.
    - All standards are referenced from the CT Guidelines for Erosion and Sediment Control.

East Haddam Subdivision Audit

- *Minimum buildable land area requirement- Section 4.06*
    - R2/R4 lots must have at least ¾ acre of land buildable.

- *Roadway requirements- Section 5.06*
    - Detailed roadway design and construction process.
    - Extensive details regarding improvements to existing streets.
    - Design of "through streets" is encouraged as opposed to cul-de-sacs.
    - As far as practical, streets shall adapt to existing terrain and wetlands and watercourses.
    - Roadway Design Criteria:
        - Minimum street width: 18-24 feet of pavement.
        - Right of way: not less than 50 feet.
        - Grades:
            - Maximum 10%.
            - Maximum 5% with 50 feet of connecting road.

- *Driveway requirements- Section 5.11*
    - Pervious material is allowed.
    - Common driveways are promoted.
    - Driveway width in low-density residential:
        - 10 feet minimum.
        - 20 feet maximum.
    - Driveway grade requirements:
        - Not to exceed 8% for unpaved.
        - Not to exceed 12% for paved.

- *Cul-de-sac requirements- Section 5.07*
    - Road rights of way shall extend into adjoining properties for potential future expansion.
    - Service area: not more then 20 lots.
    - "T" and "Y" Turnarounds are allowed.
    - Cul-de-sac dimensions:
        - Maximum length: 2,000 feet.
        - Width: 18-26 feet of pavement.
        - Minimum turnaround radius- 50 feet of pavement.

- *Winter Storm Road Treatment & Maintenance*
    - Salt and sand used.
    - Post-winter street sweeping required once a year.
    - Catch basin clean-out aim for twice a year.

- *Stormwater management- Section 4.02.4*
    - Extensive plan requirements listed.

- *Septic systems*
    - Minimum 75 feet from wetlands.
    - Septic service required every five years per Chatham Health District.

- *Subdivision open space requirements- Section 6.10*
    - Minimum required: 15% of subdivision.

East Haddam Inland Wetlands and Watercourse Audit

- *Last Update: 2004*

- *Upland Review Area- Section 3*
    - 100 feet for Conservation Subdivision & Eightmile River Watershed Overlay District.
    - 50 feet buffer from high water line in zoning regulations.

- *Special Area of review for Salmon River*
    - No

- *Overarching Issue for all Communities*
    - Need to have a discussion with local regulatory authority regarding how effective the application process is. Are the criteria specific enough? Is the information in the application requirements adequate to make the determinations?

Salmon River Watershed
Preliminary Municipal Audit for the Town of East Hampton

The following Preliminary Audits were developed as part of The Nature Conservancy's (TNC's) ongoing Salmon River Watershed (SRW) Community Assessment project by Horsley Witten Group, Inc. (HW). This document is designed to identify key policy and regulatory issues related to the Salmon River as an existing cold-water trout stream resource. HW developed this document in anticipation of one-on-one interviews with local municipal agents during which these issues will be explored in greater detail. Overall, the goal of the project is to identify municipal policies, regulations, and practices that potentially have an impact on the Salmon River from a "resource protection" perspective. Issues relative to potential water quality impacts, stream buffer specifications, innovative site design, stormwater management, and several others were targeted in this early audit phase and will serve as the basis for expanding investigations as the project progresses. The following four documents were reviewed as part of this Preliminary Audit:

1. The local Plan of Conservation and Development;
2. The Zoning Regulations;
3. The Subdivision Regulations; and
4. The Inland Wetlands and Watercourses Regulations.

The observations noted in this document are designed to guide discussions with local officials and will eventually lead to a more "guidance-oriented" document that will identify general and specific recommendations for consideration. It should be noted that these four documents do not represent the limit of local issues that will be examined as part of TNC's project. HW will also explore issues of permit review capacity, enforcement, and other housekeeping practices (e.g., snow removal and storm drain maintenance) with municipal officials over the course of the study.

East Hampton Plan of Conservation and Development Audit

- *Last Update: 2006*

- *Residential Buildout Potential by Zoning District (page 1-13)*
    - Developable Acres without sewer:
        - R1: 55
        - R2: 1,389
        - R3: 515
        - R4: 3,637
    - Developable Acres to be served by proposed sewer:
        - R1: 0
        - R2: 155
        - R3: 95
        - R4: 51
    - Potential Building Lots:

- R1: 40
- R2: 1,174
- R3: 434
- R4: 1,882

- *Water Quality Protection (page 3-6)*
  - Strategy 1: Adopt a Watershed Protection Overlay Zone that allows uses according to their potential risk to water resource protection areas.
  - Strategy 2: Consider including effective impervious coverage requirements in the Watershed Protection Overlay Zone
  - Strategy 3: Require that the "first flush" of runoff be appropriately treated in terms of quality and rate of runoff.
  - Strategy 4: Encourage site designs that minimize impervious surfaces, promote infiltration of stormwater, and reduce runoff.
  - Strategy 5: Continue to provide vegetative buffers to wetland and watercourses to filter pollutants and protect them from direct receipt of runoff.
  - Strategy 6: Limit the clearing and grading of sites to minimize the impact on natural drainage patterns.
  - Strategy 7: Promote public education programs that address "non-point" pollution issues.
  - Strategy 8: Modify the aquifer protection regulations to comply with the DEP's model Aquifer Protection Ordinance when it becomes available.
  - Strategy 9: Adopt a residential underground storage tank ordinance to prohibit the installation of new tanks, require the licensing and monitoring of existing tanks, and require the removal of older and undocumented tanks.

- *Open Space Preservation (page 3-11)*
  - Strategy 1: Consider increasing the mandatory open space "set-aside" to 20% as part of every residential development application.
  - Strategy 2: Adopt regulations to require open space equivalency factors that discount the value of environmentally constrained open space or require the mandatory portion of open space to be representative of the parcel as a whole.
  - Strategy 3: Adopt regulations to allow the acceptance of fees in lieu of open space.
  - Strategy 4: Adopt regulations to allow off-site dedication and/or banking of open space.

- *Natural Resource Protection (page 3-14)*
  - Strategy 1: Adopt developable land regulations to relate the density of development to the capability of the land to support it.
  - Strategy 4: Prohibit the introduction of non-native or invasive species during the site development or subdivision process.

- *Village Reinforcement (page 4-15)*
    - *Strategy 1:* Adopt a Village District(s) to allow traditional village development patterns that emphasize small-scale, mixed-use, architecturally compatible development that emphasizes pedestrians over motor vehicles.

- *Vehicular Transportation Needs (page 5-13)*
    - *Strategy 1:* Relate road design to its function and adjacent land uses by creating flexible standards that Emergency Services, Highway, and Planning Staff can agree upon.
    - *Strategy* 8: Reduce impervious surfaces using porous pavement systems, deferred parking, and shared parking requirements where appropriate.
    - *Strategy 9:* Reevaluate the parking requirements by use and make adjustments as necessary to ensure adequate yet efficient numbers of parking spaces.

East Hampton Zoning Regulations Audit

- *SRW Mentioned:*
    - Yes- Dedicated Salmon River Protection Area as Zoning Overlay District.

- *Districts that occupy the largest percentage of SRW*
    - Rural Residential (R4) [Sections 7.4] occupies approximately 60% of Town land within SRW.
        - Notable By-Right Uses: Single Family Dwellings, Two Family Dwellings (must contain twice minimum lot area and frontage) Accessory structures (unclear if this includes Accessory Apartments).
        - Notable Special Permit Uses: conversions of single family dwelling to two-family dwellings, community service facilities, kennels, commercial recreation, Conservation Subdivision.

- *Groundwater Overlay Zone*
    - Aquifer Protection (AP) Provisions- Section 8:
        - AP Area designated on map occupies approximately 5% of Town land within SRW (not including Salmon River Protection Area).
        - Includes all primary and secondary recharge areas as measured by USGS.
        - Requires special permit for any use allowed in underlying district that is not single family residential, accessory to single family, or parking.
        - Requires that any non-single family use be on sewer.
        - Special Provisions:
            - On-site septic shall not exceed equivalent discharge of one single family house per two acres of land.
            - Underground storage of fuels prohibited.

- *Other Protective Zones*
    - Lake Pocotopaug Protective Area (Section 7.12)
        - All proposals required to meet performance standards along with standards for other permits. Municipality commented that these performance standards could be more specific to strengthen environmental protection.
        - All development shall show that specific and adequate measures have been taken to:
            - Reduce erosion and sedimentation during construction.
            - Promote removal of sediments and nutrients in stormwater.
            - Limit area of disturbance.
            - Protect native vegetation.
            - Promote infiltration of stormwater.

        - Ensure post development peak rates do not exceed pre-development peak rates.
    - Several LID techniques are listed as potential BMPs in section 7.12.2.B

- *Riparian Overlay Zone*
    - Salmon River Protection Area (Section 9)
        - SRP Area designated on map occupies approximately 7% of Town land within SRW.
        - Special Provisions:
            - Minimum lot size 100,000 Sq. ft.
            - 500 foot setback from high water line of Salmon River. Any use within 500 foot setback shall require special permit.
            - Any development within 500 foot setback shall not contain land having greater than 20% slopes.

- *Village Center Zone*
    - Village Center Zone (VC)- Section 7.10
        - Notable By-right Uses: Retail, office, restaurants, wholesale, etc.
        - Notable Special Permit Uses: Hotel, theaters, and apartment with special provisions.
            - Apartment special provisions:
                - Residential only on second and third floors.
                - May not exceed 50% for floor area of building less than 5,000 sq ft.
                - May not exceed 33% for floor area of building more than 5,000 sq ft.
        - A building may be built on a lot line on no more than one side.

- *Open Space Design*
    - Conservation Subdivision- Section 30
        - Only permitted in R2, R3, and R4.
        - Optional to developers for subdivisions of 5 or more lots.
        - Open space required:
            - Standard: 15%.
            - Conservation: 40%.
        - No density incentives included.
        - Net buildable area is considered.
        - Management of Open Space is enforceable by Town.

- *Lot Regulations- Section 6*
    - Rear Lots are allowed and shall contain twice the minimum lot area required for the district in which it is located.
    - Minimum lot area requirements:

        - 85,000 sq.ft. in R4.
        - 60,000 sq. ft. in R2 without sewer.
        - 40,000 sq. ft. in R2 with sewer.
        - 20,000 sq. ft. in VC.
    - Minimum setbacks:
        - Front Yard:
            - 50 feet in R4.
            - 50 feet in R2.
            - 10 feet in VC (20 feet maximum).
        - Side Yard:
            - 25 feet in R4.
            - 25 feet in R2.
            - 10 feet in VC.
        - Maximum lot coverage:
            - 10% in R4.
            - 10% in R2.
            - 75% in VC.

- *Parking requirements- Section 21*
    - Parking Ratios:
        - One and two family dwellings: 2 spaces per unit.
        - Three of more dwellings: 2 plus 1.5 spaces for each dwelling.
        - Retail: 6.25 spaces per 1,000 sq. ft. plus 2 spaces.
        - Office: 6.25 spaces per 1,000 sq. ft. plus 1 per employee.
        - Restaurant: 10 spaces per 1,000 sq. ft. of public area or 1 per 4 seats (whichever is greater).
    - Allowances for pervious parking spillover lots.
    - No shared parking allowances.
    - No parking maximum limit.
    - Minimum of 10% required landscaped areas in parking lots.

- *Landscaping Requirements- Section 28.1D*
    - Landscaping requirements from Site Plan Requirements (Section 28.1.D)
    - States that preference shall be given to utilization of plant species indigenous to the area.
    - No mention of LID.

- *Earth Removal Requirements- Section 26*
    - Applicability:
        - Does not include activities that have been issued a permit by Planning and Zoning Commission.
        - Does not include any activity for alteration or construction in conjunction with appurtenances such as septic, swimming pools, utilities, walls or fencing, etc.
    - Special Permit lasting up to one year required for all other activities.

- No performance standards.

- *Erosion and Sedimentation Control- Section 27*
  - Applicability:
    - Does not include activities in which less than 0.5 acres is disturbed.
  - E&S Plan design must be site-specific and enforced.
  - All standards are referenced from CT Guidelines for Erosion and Sediment Control.

- *Stormwater Management*
  - Drainage requirements from Site Plan Requirements (Section 28)
    - References several State regulatory and guidance documents.
    - Includes traditional appurtenances such as pipes, underdrains, and detention basins.
    - States that use of channels to carry stormwater shall not be allowed except in special cases with approval of the Town.

- *Timber Harvesting- Section 24*
  - All proposals for cutting or clearing in any zone require a Special Permit.
    - Exceptions: Activity approved by Site Plan, activity clearing less than ¾ acres of land for the purpose of establishing a house or yard site.
    - No standards for reclaiming land.

East Hampton Subdivision Audit

- *Limitation on dwellings per lot*
    - Unclear where this is discussed.

- *Roadway requirements*
    - Streets and driveways shall follow existing topography of the parcel, where feasible to minimize cuts and fills. A street plan shall be designed which shall maintain the rural character of the Town.
    - Design Specifics are detailed in separate document for Town Road Standards.
    - Roadway Design Criteria:
        - Minimum residential street: 26-28 feet.
        - Right of way (local): 50 feet.

- *Driveway requirements*
    - Pervious material is allowed as approved.
    - Design not to impede road drainage nor allow water from lot onto roadway.
    - Common driveways are promoted.
    - Driveway width:
        - No clear minimum stated.
    - Driveway grade requirements.
        - 3% front line.
        - 5% next 10 feet.
        - 15% remainder of driveway.

- *Cul-de-sac requirements- Section XII.1.L*
    - Can not service more than 20 lots.
    - Cul-de-sac dimensions:
        - Maximum length: 1,500 feet.
        - Width: 24-28 feet.
        - Minimum turnaround radius- 40 radius.

- *Winter Storm Road Treatment & Maintenance*
    - Use of salt and sand.
    - Post Winter Street Sweeping is aggressive in Lake District.

- *Subdivision open space requirements- Section VI*
    - Required 1 acre per 5 lots or not less than 15% of total area of the subdivision.
    - Required 40% for Conservation Subdivision.
    - Provisions for configuring open space such that it combines with adjoining open space or forms a larger unified open space on adjacent land.
    - Can arrange Land Trade for open space of property in other area of Town than in subdivided area.

- *Erosion and Sedimentation Control- Section IX*
    - Applicability:
        - Does not include activities in which less than 0.5 acres are disturbed.
    - E&S Plan design must be site-specific and enforced.
    - All standards are referenced from CT Guidelines for Erosion and Sediment Control.

East Hampton Inland Wetlands and Watercourse Audit

- *Last Update: 2008*

- *Upland Review Area- Section 2*
  - At least 100 feet for wetlands or watercourses.
  - 150 feet for the Connecticut River
  - 500 feet for the Salmon River (Zoning regulations page 102)

- *Special Area of Review for Salmon River*
  - Yes, see above.

- *Permitted Uses as of Right and Non-Regulated Uses- Section 4*
  - Farming
  - Residential home or subdivision approved before effective date of regulations.
  - Incidental residential landscaping.
  - Recreational uses provided they do not disturb the wetland or watercourse.

- *Overarching Issue for all Communities*
  - Need to have a discussion with local regulatory authority regarding how effective the application process is. Are the criteria specific enough? Is the information in the application requirements adequate to make the determinations?

Salmon River Watershed
Preliminary Municipal Audit for the Town of Glastonbury

The following Preliminary Audits were developed as part of The Nature Conservancy's (TNC's) ongoing Salmon River Watershed (SRW) Community Assessment project by Horsley Witten Group, Inc. (HW). This document is designed to identify key policy and regulatory issues related to the Salmon River as an existing cold-water trout stream resource. HW developed this document in anticipation of one-on-one interviews with local municipal agents during which these issues will be explored in greater detail. Overall, the goal of the project is to identify municipal policies, regulations, and practices that potentially have an impact on the Salmon River from a "resource protection" perspective. Issues relative to potential water quality impacts, stream buffer specifications, innovative site design, stormwater management, and several others were targeted in this early audit phase and will serve as the basis for expanding investigations as the project progresses. The following three documents were reviewed as part of this Preliminary Audit:

1. The Zoning Regulations;
2. The Subdivision Regulations; and
3. The Inland Wetlands and Watercourses Regulations.

The observations noted in this document are designed to guide discussions with local officials and will eventually lead to a more "guidance-oriented" document that will identify general and specific recommendations for consideration. It should be noted that these three documents do not represent the limit of local issues that will be examined as part of TNC's project. HW will also explore issues of permit review capacity, enforcement, and other housekeeping practices (e.g., snow removal and storm drain maintenance) with municipal officials over the course of the study.

Glastonbury Zoning Regulations Audit

- *SRW Mentioned*
  - No

- *Districts that occupy the largest percentage of SRW*
  - Reserved Land Zones occupies approximately 55% of Town land within SRW.
  - Rural Residence (RR) and Country Residence combined occupy approximately 45%
    - Notable By-Right Uses: Single Family Housing
    - Notable Special Permit Uses: accessory apartment, day care, golf courses, earth removal, riding stables, sewage disposal.

- *Groundwater Overlay Zone*
  - Groundwater Protection District- Section 20
    - Zone 2 occupies much of Town land within SRW.

        - Determined by depth to bedrock.
        - More restrictive than State Health Code in terms of regulation of septic systems.
            - Less of a buffer to groundwater.
            - Less of a buffer to ledge.
            - Cannot place fill above to create larger buffer.
        - Nitrogen loading limits that limit lawn area.

- *Riparian Overlay Zone*
    - No

- *Open Space Design*
    - Open Space Subdivision- Section 6.7
        - Optional but pushed by staff.
        - Open space required:
            - At least equal to the difference between the area of the lots as permitted in the zone and the area of reduced lots as permitted by the open space subdivision.
        - Lots may be reduced to not less than 25,000 sq. ft. within SRW (Limitations from Groundwater Protection make lots this small difficult)
        - Outside sewer area lots must have Town Sanitarian's approval and must meet standards of Groundwater Protection Regulations.
        - No density incentives.
        - Net buildable area is NOT considered but recommended in POCD.
        - Design flexibility is allowed and determines the amount of resulting open space.
        - Management of Open Space is NOT enforceable.

- *Other flexible multi-family or mixed-use development tool*
    - Planned Area Development Zone (PAD) [Section 4.12]
        - Allows mixed land uses.
        - Minimum acreage needed:
            - CR Zone: 25 acres.
            - RR zone: 20 acres.
        - Density allowed:
            - CR Zone: 0.5 units per acre.
            - RR zone: 1 unit per acre.

- *Lot Regulations- Section 4.0*
    - Minimum lot area requirements:
        - 2 acres per lot in CR
        - 1 acre per lot in RR.
    - Minimum setbacks:
        - Front Yard:

        - 75 feet in CR.
        - 50 feet in RR.
    - Side Yard:
        - 35 feet in CR.
        - 25 feet in RR.
    - Maximum building coverage:
        - 15% in CR.
        - 10% in RR.

- *Parking requirements- Section 9*
    - Parking Ratios:
        - Residential: 1 spaces per unit.
        - Retail: 6.7 spaces per 1,000 sq. ft.
        - Office: 5 spaces per 1,000 sq. ft.
        - Restaurant: 1 spaces per 3 seats at a table and 1 space for every two seats at a counter.
    - Allowances for shared parking- potential for 30% reduction
    - Allowances for pervious parking spillover lots
    - No parking maximum limit

- *Earth Removal Requirements- Section 6.2*
    - Applicability:
        - Does not include activities that have been issued a building permit.
        - Does not include activities that have NOT been issued a building permit and involves under 600 cubic yards of earth for each lot.
    - Limited restoration standards.

- *Erosion and Sedimentation Control- Section 19*
    - Applicability:
        - Does not included activities in which less then 0.5 acres are disturbed.
        - Does not include single family dwelling that is not part of a subdivision.
    - E&S Plan design must be site-specific and enforced.
    - All standards are referenced from CT Guidelines for Erosion and Sediment Control.

Glastonbury Subdivision Audit

- *Roadway requirements- Section 10*
    - Design of "through streets" is encouraged as opposed to cul-de-sacs.
    - Extensive discussion of need for streets to adapt to existing terrain.
    - A developer may be required to improve existing access streets if they do not meet current standards such as sight lines, drainage, or pavement width, however, there is a clause that allows the Commission to waive improvements if there is environmental disturbance.
    - Roadway Design Criteria:
        - Minimum street width: 22 feet of pavement.
        - Right of way (local): 40 feet.

- *Driveway requirements*
    - Pervious material is allowed.
    - Common driveways are promoted.
    - Driveway width in low-density residential:
        - No minimum unless shared rear lot.

- *Cul-de-sac requirements- Section 10.5*
    - To design a permanent dead end, it shall be determined that there is an inability for full access at or near this location from adjoining properties.
    - Road rights of way shall extend into adjoining properties for potential future expansion.
    - Service area not specified.
    - "T" and "Y" Turnarounds are allowed.
    - Cul-de-sac dimensions:
        - Maximum length: 1,500 feet, can get a waiver for more for purposes of future roadway access.
        - Width: 25 feet of pavement.
        - Minimum turnaround radius- 45 feet of pavement

- *Winter Storm Road Treatment & Maintenance*
    - Salt de-icing material used.
    - Post winter street sweeping required twice a year.
    - Catch basin clean-out required twice a year.

- *Sidewalk Construction- Section 11*
    - Sidewalk required on one side of street in RR district.
        - Can waive sidewalk requirement if it will have adverse impact on environment.
    - Sidewalk not required in CR district.

- *Utility Placement- Section 13.1*
    - Located within Right of Way.

- *Subdivision open space requirements- Section 6*
    - No specified minimum.
    - Shall not apply to subdivisions of 5 acres or less.
    - Condition provided that open space shall remain in natural state unless approved by Commission.
    - Can consider other tracks of land that are not subdivided immediately for possible open space calculations.

Glastonbury Inland Wetlands and Watercourse Audit

- *Last Update: 1989 (proposed revisions 2008)*

- *Upland Review Area- Section 3*
  - 100 feet from all wetlands and watercourses.
  - (Proposed: 150 feet review area with standards relating to impervious surface coverage).

- *Special Area of review for Salmon River*
  - Proposed, see above.

- *Proposed Additional Regulations:*
  - In specific cases, the Agency may review an activity beyond the specified upland review areas in relation to an activity's potential impacts or effects on watercourses.

- *Overarching Issue for all Communities*
  - Need to have a discussion with local regulatory authority regarding how effective the application process is. Are the criteria specific enough? Is the information in the application requirements adequate to make the determinations?

Salmon River Watershed
Preliminary Municipal Audit for the Town of Haddam

The following Preliminary Audits were developed as part of The Nature Conservancy's (TNC's) ongoing Salmon River Watershed (SRW) Community Assessment project by Horsley Witten Group, Inc. (HW). This document is designed to identify key policy and regulatory issues related to the Salmon River as an existing cold-water trout stream resource. HW developed this document in anticipation of one-on-one interviews with local municipal agents during which these issues will be explored in greater detail. Overall, the goal of the project is to identify municipal policies, regulations, and practices that potentially have an impact on the Salmon River from a "resource protection" perspective. Issues relative to potential water quality impacts, stream buffer specifications, innovative site design, stormwater management, and several others were targeted in this early audit phase and will serve as the basis for expanding investigations as the project progresses. The following three documents were reviewed as part of this Preliminary Audit:

1. The Zoning Regulations;
2. The Subdivision Regulations; and
3. The Inland Wetlands and Watercourses Regulations.

The observations noted in this document are designed to guide discussions with local officials and will eventually lead to a more "guidance-oriented" document that will identify general and specific recommendations for consideration. It should be noted that these three documents do not represent the limit of local issues that will be examined as part of TNC's project. HW will also explore issues of permit review capacity, enforcement, and other housekeeping practices (e.g., snow removal and storm drain maintenance) with municipal officials over the course of the study.

Haddam Zoning Regulations Audit

- *Salmon River Watershed mentioned*
  - No

- *Districts that occupy the largest percentage of SRW*
  - Rural Residential (R2)
    - Notable By-Right Uses: single family housing, two-family housing, bed and breakfast inns.
    - Notable Special Permit Uses: Conservation Subdivision, accessory apartments, nursing homes.

- *Groundwater Overlay Zone*
  - Aquifer Protection Zone (AP)- Section 12
    - Some of the AP Zone lies within the SRW.
    - AP Zone concurrent with primary and secondary recharge areas.

        - Prohibits traditional high polluting uses such as landfills, underground storage tanks, road salt, etc.

- *Other Protective Zones*
    - Gateway Conservation Zone- Section 10
        - 100 foot setback from watercourse for all new construction or enlargements unless granted a special permit.
        - Dumping is prohibited.
        - Earth removal is prohibited aside from what is allowed as a permitted earth removal use (small scale residential activities).

- *Riparian Overlay Zone*
    - No

- *Open Space Design*
    - Conservation Subdivisions- Section 4A
        - Mandatory design and Town Engineers decide whether to utilize Conservation design or not.
        - Applicable for any subdivision.
        - Open space required: 45-55%
        - Includes density incentives.
        - Net buildable area is considered.
        - Design flexibility is allowed.
        - Management of Open Space is enforceable by the Town.

- *Lot Regulations- Table 1*
    - Minimum lot area requirements:
        - 2 acre per lot in R2.
    - Minimum setbacks:
        - Front Yard:
            - 40 feet in R2.
        - Side Yard:
            - 20 feet in R2.
        - Minimum Setback from watercourse (Gateway Zone)
            - 50 feet.
    - Maximum building coverage:
        - 10% in R2.

- *Parking requirements- Section 21*
    - Parking Ratios:
        - Residential: 2 spaces per unit.
        - Retail: 5 spaces per 1,000 sq. ft plus 1 per employee.
        - Office: 2.86 spaces per 1,000 sq. ft. plus 1 per employee.
        - Restaurant: 1 space per 50 sq. ft. of public area plus 1 per employee.
    - No allowances for shared parking.

- No allowances for pervious parking.
- No parking maximum limit.

- *Earth Removal Requirements- Section 18*
  - Applicability:
    - Does not include activities that have been issued a building permit.
    - Does not include activities that have NOT been issued a building permit and involves under 300 cubic yards of earth for each lot.
  - Includes minimal restoration standards.

- *Erosion and Sedimentation Control- Section 27*
  - Applicability:
    - Does not included activities in which less then 0.5 acres are disturbed.
    - Does not include single family dwelling that is not part of a subdivision.
  - E&S Plan does not need to be site-specific and is not clearly enforced.
  - All standards are referenced from CT Guidelines for Erosion and Sediment Control.

Haddam Subdivision Audit

- *Roadway requirements- Section 4.4*
    - As far as practical, streets shall adapt to existing terrain and wetlands and watercourses.
    - A developer may be required to improve existing access streets if they do not meet current standards.
    - Roadway Design Criteria- Section 4.4.4:
        - Minimum street width: 24 feet of pavement.
        - Right of way (local): not less than 50 feet.
        - Grades: maximum 10% on minor streets.

- *Driveway requirements- Section 4.4.7*
    - Pervious material is allowed.
    - Common driveways are not promoted.
    - Driveway width in low-density residential.
        - No minimum.
        - 25 feet maximum.
    - Driveway grade requirements.
        - Not to exceed 15%.
        - Grades >10% must be paved.

- *Cul-de-sac requirements- Section 4.4.2.2.f*
    - Road rights of way shall extend into adjoining properties for potential future expansion.
    - No specified service area.
    - Cul-de-sac dimensions:
        - Maximum length: 1,000 feet. Can be longer if street will be turned into a through street.
        - Width: 22-24 feet of pavement.
        - No specified minimum turnaround radius- islands allowed.

- *Winter Storm Road Treatment & Maintenance*
    - Not specified.

- *Sidewalk Construction- Section 4.13*
    - Commission given discretion to require sidewalks if development occurs near schools, playgrounds, and other places deemed necessary.

- *Drainage Requirements- Section 4.6*
    - Allowances for use of "ditches" to convey stormwater.
    - Requirement that no stormwater shall be diverted from one watershed to another via drainage system.
    - Roadway Stormwater Capacity: 10-year storm.

- *Subdivision open space requirements- Section 4.14*

- Minimum requirement of 20-25% of subdivision.
- Condition provided that open space shall remain in natural state unless approved by Commission.
- Commission may waive open space requirement if it finds there are other recreational areas within 0.25 miles, minimum reservation area is less than one acre, or there exists other conservation restrictions or general size of lots does not warrant open space dedication.

Haddam Inland Wetlands and Watercourse Audit

- *Last Update: 2000*

- *Upland Review Area- Section 3*
    - 100 feet for any tidal wetland, major watercourses, or wetlands contiguous to a major watercourse, all wetland and watercourses in the Salmon River watershed and in Public Supply watersheds.
    - 50 feet for any other wetland or watercourse.
    - If the slope of the upland review area exceeds an average of a 10% grade, an additional 50 feet shall be added to the horizontal width of the upland review area.
    - Within its discretion, the Commission may rule that any other activity located within such upland review area or in any other non-wetland or non-watercourse area may have such an adverse impact on wetlands or watercourses and is a regulated activity.

- *Special Area of Review for Salmon River:*
    - Yes, see above.

- *Overarching Issue for all Communities*
    - Need to have a discussion with local regulatory authority regarding how effective the application process is. Are the criteria specific enough? Is the information in the application requirements adequate to make the determinations?

Salmon River Watershed
Preliminary Municipal Audit for the Town of Hebron

The following Preliminary Audits were developed as part of The Nature Conservancy's (TNC's) ongoing Salmon River Watershed (SRW) Community Assessment project by Horsley Witten Group, Inc. (HW). This document is designed to identify key policy and regulatory issues related to the Salmon River as an existing cold-water trout stream resource. HW developed this document in anticipation of one-on-one interviews with local municipal agents during which these issues will be explored in greater detail. Overall, the goal of the project is to identify municipal policies, regulations, and practices that potentially have an impact on the Salmon River from a "resource protection" perspective. Issues relative to potential water quality impacts, stream buffer specifications, innovative site design, stormwater management, and several others were targeted in this early audit phase and will serve as the basis for expanding investigations as the project progresses. The following four documents were reviewed as part of this Preliminary Audit:

1. The local Plan of Conservation and Development;
2. The Zoning Regulations;
3. The Subdivision Regulations; and
4. The Inland Wetlands and Watercourses Regulations.

The observations noted in this document are designed to guide discussions with local officials and will eventually lead to a more "guidance-oriented" document that will identify general and specific recommendations for consideration. It should be noted that these four documents do not represent the limit of local issues that will be examined as part of TNC's project. HW will also explore issues of permit review capacity, enforcement, and other housekeeping practices (e.g., snow removal and storm drain maintenance) with municipal officials over the course of the study.

Hebron Plan of Conservation and Development Audit

- *Last Update: 2004*

- *Land Use Profile (page 10 and 19)*
  - 49% Uncommitted Land (55% buildable- no wetlands and <25% slope)
  - 33% Single Family
  - 16% Protected Open Space
  - < 1% Multi-family
  - < 1% Institutional
  - < 1% Commercial
  - < 1% Industrial

- *Plan For Residential Growth- Section 1.F*
  - Objective 5: Encourage clustering of housing to preserve natural features.

- Objective 6: Encourage innovative design of residential developments by establishing flexible land use regulations.

- *Underground Drinking Water Supplies- Section 2.A. (Natural Resources Inventory)*
  - Objective 2: Investigate and encourage measures that will promote safe recharge of ground water supplies. Consider such measures such as discharge of roof drains into subsurface infiltrators, sheet drainage from paved areas, or open drainage swales rather than closed drainage systems.

- *Stream Corridors and Bodies of Water- Section 2.B. (Natural Resources Inventory)*
  - Introduction: Salmon River mentioned as important resource.
  - Objective 1: Maintain less than 10% impervious surface in all regional and sub-regional watersheds.
  - Objective 3: Restrict clear cutting in environmentally sensitive stream corridors.
  - Objective 5: As part of Town's Greenway concept, encourage the dedication of open space and conservation easements along corridors of significant value.
  - Objective 4: Continue to assess wetland areas and strengthen Inland Wetlands and Watercourses Regulations for ecologically sensitive areas.

- *Wildlife, Plant Life and Other Significant Natural Features- Section2.F. (Natural Resources Inventory)*
  - Map No. 7: Salmon habitat, spawning, and resting areas identified.

- *The Open Space Plan- Section 2.J.*
  - Objective 4: Continue to study and encourage aggressive cluster or open space subdivisions and zoning techniques to allow flexibility in new development.
  - Objective 15: Establishment of "Future Open Space" map to guide Town efforts to expand, preserve, and improve open space system in Town.

- Emergency Service- Section 4.B
  - Objective 5: Proceed to amend Zoning to establish height limit of two stories to prevent need for aerial ladder truck in the community.

Hebron Zoning Regulations Audit

- *Salmon River Watershed mentioned*
  - No

- *Districts that occupy the largest percentage of SRW*
  - Residence-1 (R1) and Residence-2 (R2) [Sections 5.1 and 5.2] occupy approximately 95% of Town land within SRW
    - Notable By-Right Uses: Single Family Housing, Accessory Apartments (with approval of septic or sewer system).
    - Notable Special Permit Uses: Open Space Subdivision.

- *Groundwater Overlay Zone*
  - Section 5.8- Aquifer Protection District (AP)
    - AP District occupies approximately 7% of Town land within SRW.
    - AP District concurrent with an extensive deposit of course grained, stratified drift. (high yielding water conditions that are more susceptible to contamination).
    - Prohibits traditional high polluting uses such as landfills, gas stations, road salt, etc.
    - Earth Removal allowed only by Special Permit.

- *Other Protective Zones*
  - Section 5.3- Amston Lake District (AL)
    - AL District occupies approximately 3% of Town land within SRW.
    - Concern of old housing/septic systems near sensitive surface water resource.
    - TDR sending area.

- *Riparian Overlay Zone*
  - No

- *Village Center Zone*
  - Section 5.7- Hebron Green District (HG), 5.9- Amston Village District (AV), and 5.10- Village Green District (VG).
    - The HG and AV Districts are aligned with historic village centers.
      - HG District
        - Single family housing only by-right use.
        - Special Permit for mixed uses
        - Special Permit for multi-family
        - Special parking provisions- Section 8.3.4.c and 8.3.5.e.
      - AV District
        - Within Aquifer Protection District.
        - Discourages establishment of new uses.

        - Single family housing only by-right use.
    - VG District
        - Lies near the HG District and appears to be intended for newer development to occur in a traditional village pattern.
        - Coordinated development allowed through Special Permit.
        - Mixed-uses allowed.
        - Multi-family allowed.
        - Pedestrian-oriented design standards.
        - Innovative parking standards:
            - On-street parking encouraged.
            - Shared parking.
            - Incentives to reach 20-45% reduction in parking.
        - Drainage standards:
            - No increase in post development peak run-off.
        - Native vegetation throughout village.

- *Open Space Design*
    - Section 8.18-Open Space Subdivision
        - Optional to developers.
        - Applicable at >5 acres with sewer, >10 acres without sewer.
        - Open space required:
            - Standard Subdivision: 20%.
            - Open Space Subdivision: 30%.
            - Open Space Subdivision in Sewer Service District: 40%.
        - Includes density incentives.
        - Net buildable area is considered.
        - Design flexibility is allowed if affordable housing or extra open space is included.
        - Management of Open Space is enforceable.

- *Other flexible multi-family or mixed-use development tool*
    - Section 8.22- Planned Residential Development District (PRD)
        - Similar standards to Open Space Subdivision (OSS)
        - Difference between PRD and OSS:
            - PRD only allowed within Town Sewer Service District.
            - Must apply to have a PRD District adopted by Commission.
            - PRD has no minimum land area requirement.
            - PRD allows multi-family housing.

- *Lot Regulations- Section 6.1*
    - Residential lots can have multiple buildings on one lot (Section 5.1) but all buildings must comply with base lot regulations and setbacks.
    - Minimum lot area requirements:
        - 1 acre per lot in R1.

        - 2 acres per lot in R2.
        - 0.5 acres per lot in AL, AV, NC, GB and HG.
        - Unclear in VG.
    - Minimum setbacks:
        - Front Yard:
            - 30 feet in most commercial or mixed use districts.
            - Flexibility allowances in HG and VG.
        - Side Yard:
            - 15 feet in most commercial or mixed use districts.
            - Flexibility allowances in HG and VG.
            - Flexibility to waive side yard setbacks in non-residential zones if consolidating development on adjoining lots.
        - Maximum building coverage:
            - 10-15% in R1/R2.
            - 20-30% in non-residential districts.
            - No direct limit on impervious surface coverage.

- *Parking requirements- Section 8.3*
    - Parking Ratios:
        - Residential: 2 spaces per unit.
        - Retail: 6.7 spaces per 1,000 sq. ft.
        - Office: 5 spaces per 1,000 sq. ft.
        - Restaurant: 10 spaces per 1,000 sq. ft.
    - Allowances for shared parking- potential for 25% reduction.
    - Allowances for pervious parking spillover lots.
    - No parking maximum limit.
    - Minimum of 20% required landscaped areas in parking lots (Section 8.15.4).

- *Landscaping Requirements- Section 8.15*
    - Business or industrial uses must provide landscaping on 25% of lots unless the lot is less than one acre in which case 15% landscaping may be required.
    - Front yard landscaping requirement: 20-30 feet wide.
    - Side/Rear yard landscaping requirement: 10 feet wide, with 50% of side yards at least 25 feet wide.
    - Non-native plant species prohibited.
    - Inclusion of LID standards in Section 8.24.

- *Earth Removal Requirements- Section 8.9*
    - Applicability:
        - Does not include activities that have been issued a building permit.
        - Does not include activities that have NOT been issued a building permit and involves under 600 cubic yards of earth for each lot.
    - Includes restoration standards.

- *Erosion and Sedimentation Control- Section 8.13*
    - Applicability:
        - Does not included activities in which less then 0.5 acres is disturbed.
        - Does not include single family dwelling that is not part of a subdivision.
    - E&S Plan design must be site-specific and enforced.
    - All standards are referenced from CT Guidelines for Erosion and Sediment Control.

- *Stormwater Management- Section 8.24*
    - Applicability:
        - Does not include activities that disturb less than one acre of land and have less then 10% impervious surface.
    - Includes reference to 2004 DEP Manual for LID standards and site design practices.
    - SW Maintenance plan is required
    - Impervious surface limits are unclear

- *Floodplain restrictions- Section 8.10*
    - New construction and substantial improvements elevated above base flood elevation.

Hebron Subdivision Audit

- *Limitation on dwellings per lot- Section 6.3*
    - Rear lots are limited to one dwelling per lot and require a minimum lot size of five acres.

- *Roadway requirements- Section 6.4*
    - Design of "through streets" is encouraged as opposed to cul-de-sacs.
    - As far as practical, streets shall adapt to existing terrain, wetlands, and watercourses.
    - A developer may be required to improve existing access streets if they do not meet current standards such as sight lines, drainage or pavement width, however, there is a clause that allows the Commission to waive improvements to preserve "unique character of Town's streetscapes".
    - Roadway Design Criteria- Section 13.5:
        - Minimum street width: 22 feet of pavement.
        - Right of way (local): not less than 50 feet, more if swales included.
        - Grades: maximum 10% on minor streets.
        - Limiting cut and fill activities encouraged for road design.

- *Driveway requirements- Section 13.10*
    - Pervious material is allowed.
    - Common driveways are promoted.
    - Driveway width in low-density residential.
        - 10 feet minimum
        - 20 feet maximum
    - Driveway grade requirements.
        - Not to exceed 8% on street right-of-ways.
        - Not to exceed 12% on private property.
        - Grades >10% must be paved.

- *Cul-de-sac requirements- Section 13.5H*
    - Road rights of way shall extend into adjoining properties for potential future expansion.
    - Service area: not more then 20 lots.
    - "T" and "Y" Turnarounds are allowed.
    - Island required unless otherwise approved by Commission.
    - Cul-de-sac dimensions:
        - Maximum length: 2,000 feet.
        - Width: 22-24 feet of pavement.
        - Minimum turnaround radius- 45 feet of pavement, island allowable.

- *Winter Storm Road Treatment & Maintenance*
    - Salt and sand used.

- Post winter street sweeping required once a year. Twice a year if in Amston Lake district.
- Unknown frequency of catch basin clean-out.

- *Sidewalk Construction- Section 13.5R*
  - Commission given discretion to require sidewalks if development occurs near schools, public buildings, parks, playgrounds, shopping areas, transit stops, or high density residential areas.

- *Utility Placement- Section 13.5K*
  - Located within Right of Way.

- *Curbing- Section 6.6.B*
  - Allowances for alternative drainage systems that incorporate off-road swales in lieu of catch basins and piping.

- *Stormwater Management- Section 5.5G and 6.6*
  - Plan required. Waiver can be granted if less then one acre disturbed and less then 10% impervious.
  - Reference to 2004 CT SW Manual- 5.5.G.6.b
    - Specific reference to LID section of 2004 Manual
  - Section 6.6.B- Allowances for alternative drainage systems that incorporate off-road swales in lieu of catch basins and piping. Municipality notes that staff encourage open swales as the first preference in a project.
    - Details provided in Plate 6.
  - Town can retain drainage easements and rights when there is a watercourse within the subdivision, or when stormwater discharge is proposed through private property or into existing natural wetlands or watercourses.
  - Drainage Design Criteria- Section 13.7:
    - To apply for open drainage (roadside swales), the applicant must submit a special report as part of the application.
    - Detailed listing of information required for open drainage.
    - Design criteria for "open channels".
    - Roadway Stormwater Capacity: 10-year storm.
    - Listing of culvert crossing standards based on different structure sizes.

- *Erosion and Sedimentation Control Plan- Section 5.5.D and 6.7*
  - Required to meet CT Guidelines if over 0.5 acres.
  - No cut and fill limits steeper then 2:1 unless stabilized by retaining wall or cribbing.
  - Enforcement procedures included with regular use of "should".
  - Enforcement procedures include a reference to USDA standards regarding changing soil and surface conditions.

- *Septic Systems- Section 6.9*
    - Largely regulated by Hebron Health Department.
    - Septic system shall be located no closer than 100 feet to Inland Wetland soils or any watercourse.
    - Septic service required every five years per Chatham Health District.

- *Subdivision open space requirements- Section 6.10*
    - Minimum require 20% of subdivision.
    - Minimum required open space shall not include:
        - Inland wetlands soils.
        - Slopes of 30% or greater.
    - Condition provided that open space shall remain in natural state unless approved by Commission.
    - Fee-in-lieu of open space available with Commission's approval.

- *Landscaping- Section 13.9*
    - References State Standard Specifications (construction) for topsoil, turf establishment, and liming.

Hebron Inland Wetlands and Watercourses Audit

- *Last Update: 2005*

- *Upland Review Area- Section 2.24*
    - At least 100 feet for all wetlands or watercourses.
    - 300 feet required for the several specified wetland areas (Section 2.24.1).
    - 200 feet required for the several other specified wetland areas (Section 2.24.2).
    - The Agency may rule that activity in any other non-wetland or non-watercourse area is likely to impact or affect wetlands or watercourses and is a regulated activity.

- *Special Area of Review for Salmon River*
    - Yes, new zone along Jeremy River

- *Permitted Uses as of Right and Non-Regulated Uses- Section 4*
    - Farming
    - Residential home or subdivision approved before effective date of regulations.
    - Incidental residential landscaping
    - Recreational uses provided they do not disturb the wetland or watercourse.

- *Overarching Issue for all Communities*
    - Need to have a discussion with local regulatory authority regarding how effective the application process is. Are the criteria specific enough? Is the information in the application requirements adequate to make the determinations?

Salmon River Watershed
Preliminary Municipal Audit for the Town of Marlborough

The following Preliminary Audits were developed as part of The Nature Conservancy's (TNC's) ongoing Salmon River Watershed (SRW) Community Assessment project by Horsley Witten Group, Inc. (HW). This document is designed to identify key policy and regulatory issues related to the Salmon River as an existing cold-water trout stream resource. HW developed this document in anticipation of one-on-one interviews with local municipal agents during which these issues will be explored in greater detail. Overall, the goal of the project is to identify municipal policies, regulations, and practices that potentially have an impact on the Salmon River from a "resource protection" perspective. Issues relative to potential water quality impacts, stream buffer specifications, innovative site design, stormwater management, and several others were targeted in this early audit phase and will serve as the basis for expanding investigations as the project progresses. The following four documents were reviewed as part of this Preliminary Audit:

1. The local Plan of Conservation and Development;
2. The Zoning Regulations;
3. The Subdivision Regulations; and
4. The Inland Wetlands and Watercourses Regulations.

The observations noted in this document are designed to guide discussions with local officials and will eventually lead to a more "guidance-oriented" document that will identify general and specific recommendations for consideration. It should be noted that these four documents do not represent the limit of local issues that will be examined as part of TNC's project. HW will also explore issues of permit review capacity, enforcement, and other housekeeping practices (e.g., snow removal and storm drain maintenance) with municipal officials over the course of the study.

Marlborough Plan of Conservation and Development Audit

- *Last Update: 2008*

- *Land Use Profile:*
  - 30% Vacant/Potentially Developable
  - 44% Single Family
  - 22% Protected Open Space
  - < 2% Commercial
  - < 1% Industrial
  - < 1% Multifamily

- *Environmental Goals:*

- Goal 2: Preserve stream bank and lake shoreline vegetative buffers and the abutting significant upland buffers through the development of buffer and setback areas.
- Goal 4: Preserve contiguous forested areas and promote forest best management practices and develop a strategic plan for the future acquisition of forest land.
- Goal 5: Preserve and enhance the water quality of all watercourses through the utilization of public education outreach and regulatory best management practices.
- Goal 6: Continue the Lake Terramuggus water testing program and monitor the results and implement necessary best management practices to preserve the water quality of the lake.
- Goal 7: Adopt policy and regulations based on best management practices for stormwater management and provide public outreach. The Town should utilize particle separators at all outfalls to prevent the migrations of sediment and other harmful elements for discharging into surface waters.
- Goal 14: Encourage the acquisition of land along the major watercourse for preservation of natural resources and to permit public access to these natural resources.

- *Residential Recommendations:*
  - The Zoning Commission should consider the reclassification of the residential zoning districts within the Lake Terramuggus watershed to include sub-districts within the Lake District. Within these sub-districts, there would be appropriate bulk standards to permit the reasonable use of the property and environmental standards to maintain the water quality of Lake Terramuggus.

- *Greenway Development Tasks:*
  - Examine opportunities with the Towns of Colchester, East Hampton, Glastonbury and Hebron to create a continuous greenway system.

Marlborough Zoning Regulations Audit

NOTE: Zoning Regulations currently under revision.

- *Salmon River Watershed mentioned*
  - No

- *Districts that occupy the largest percentage of SRW*
  - Residential Districts [Article 6]:
    - Notable by-right uses: single-family detached dwelling, accessory buildings and apartments.
    - Notable special exception uses: Tourist homes, inns, and bed and breakfast operations. Commercial kennels, vet clinic.
    - Rear Lots are allowed with 50-foot wide access strip.

- *Groundwater Overlay Zone*
  - No

- *Riparian Overlay Zone*
  - None

- *Village Center Zone*
  - Town does not appear to have a zone designated as a mixed-use village center.

- *Open Space Design*
  - Open Space Conservation Area Regulation (OSCAR) [Article 6.E]
    - Minimum five lots in subdivision.
    - Appears to be required for developers to show design of OSCAR for any subdivision of over five lots.
    - Open space required:
      - Standard: 20%.
      - OSCAR: 40% .
    - No density incentives- only dimensional relief.
    - Cannot consider slopes greater than 20% for buildable area.
    - Unclear if management of Open Space is enforceable.

- *Other flexible multi-family or mixed-use development tool*
  - Floating Zones [Article 6.F]
    - Must apply for zoning change.
    - Intent is to encourage the permitting of multiple principal residential buildings on one lot.
    - Minimum lot size is 12 acres.
    - No more than six units per buildings.

        - Dimensional regulations:
            - One bedroom- 20,000 sq. ft. minimum land area.
            - Two bedroom- 30,000 sq. ft. minimum land area.
            - Three bedroom- 40,000 sq. ft. minimum land area.
        - Floating zone for Adult Living Development
            - Can be age restricted to 55 or older.
        - Floating zone for Planned Residential Recreational Development.
            - 70% of open space can be for recreational use.
        - Designed Commercial Zone that mimics the structure of Floating Zones strictly for commercial structures.

- *Lot Regulations- Article 6*
    - Underlying residential district does not allow more than one principal building.
    - Minimum lot area requirements:
        - 3 acres for rear lot.
        - ~2 acres per lot in Residential with septic.
        - 50,000 sq. ft. per lot in Residential with sewer.
        - 40,000 sq. ft. per lot in OSCAR with septic.
        - 30,000 sq. ft. per lot in OSCAR with sewer.
        - 20,000 sq. ft. minimum land area in Floating Zone.
        - 60,000 sq. ft. per lot in Commercial
    - Minimum setbacks:
        - Front Yard:
            - 50 feet in Residential.
            - 20 feet in OSCAR.
            - 50 feet in Commercial
        - Side Yard:
            - 15 feet in Residential.
            - 15 feet in OSCAR.
            - 15 feet in Commercial.
        - Maximum building coverage:
            - 10% in Residential.
            - 25% in Floating Zone.
            - 25 % in Commercial.

- *Parking requirements- Article 10.E*
    - Parking Ratios:
        - Residential: two spaces per unit.
        - Residential in Floating District: 2.5 per unit.
        - Retail: six spaces per 1,000 sq. ft.
        - Office: four spaces per 1,000 sq. ft.
        - Restaurant: one space per three seats plus one space per 20 sq. ft. of counter or bar space plus per 50 sq. ft. of open floor area.
    - No shared parking allowances

- Pervious parking spillover allowed within Town Center.
- No parking maximum limit
- Zoning and Planning Commission may reduce the number spaces by not more than 10%.
- 10% minimum percentage of landscaped area within parking lot.

- *Landscaping Requirements- Article 10.C*
  - No construction or soil deposits shall take place within four feet of shrubs and within 15 feet of trees to be retained onsite.
  - Minimum of 10% of parking lot shall be landscaped.
  - No specific mention of prohibiting non-native plant species- instead a listing of several recommended tree types.
  - No mention of LID.

- *Earth Excavation - Filling- Article 10.B*
  - Applicability:
    - Permit required for more than 125 cubic yards per lot.
    - Permit not required for an activity with a zoning permit.
  - Limited standards regarding reclaiming site.

- *Soil Erosion and Sediment Control- Article 10.G*
  - E&S Plan design must be site-specific and enforced.
    - Zoning permit shall not be given until E&S measures are installed, inspected and approved by agent of Commission.
  - Incorporates State guidelines by reference.

- *Stormwater Management Plan*
  - No

- *Flood Hazard Overlay District*
  - No

Marlborough Subdivision Audit

- *Limitation on dwellings per lot- Article 6 of zoning regulations*
    - All districts shall not have more than one principal building per lot except:
        - Floating Districts:
            - Designed Multiple Residence
            - Adult Living Development
            - Planned Residential Recreational Development
        - Designed Commercial Zone
        - Designed Industrial Zone
        - Designed Recreational Zone
    - Rear lots shall be a minimum of 3 acres and have a 50 foot wide access strip (Subdivision Section 5.2.4).

- *Roadway requirements- Section 5.4*
    - Design of street shall bear logical relationship to natural topography of property.
    - No requirements relative to maintaining a right of way at end of cul-de-sac for future roadway expansion.
    - A developer may be required to improve existing access streets if they do not meet current standards.
    - Roadway Design Criteria:
        - Minimum light residential street: 22-28 feet of paved surface with potential to be re4duced additional 2 feet with Commission's approval.
        - Right of way (local): 50 feet.

- *Driveway requirements- Section 5.5*
    - Pervious material is allowed as approved.
    - Common driveways are promoted with extensive standards.
    - Driveway width:
        - 10 feet minimum
        - 20 feet for common driveway.
        - No maximum
    - Driveway grade requirements.
        - Grades >5% must be paved.

- *Cul-de-sac requirements- Section 5.4.6*
    - Encourage design of cul-de-sacs that have ability to be extended into adjoining properties for potential future expansion.
    - Service area not specified.
    - Cul-de-sac dimensions:
        - Maximum length: 1,000 feet.
            - Can be 2,000 feet if applicant can demonstrate no hazard to public welfare.

        - Can be 3,000 feet if applicant can demonstrate the ability to construct a through street in the future.
    - Width: 22-28 feet of paved surface.
    - Minimum 60-foot radius, island allowed.

- *Sidewalk Construction- Section 5.8.1*
    - Sidewalks shall be required based on Commission's discretion and specifically where deemed essential to provide access to schools, playgrounds, or other community facilities.

- *Winter Storm Road Treatment & Maintenance*
    - Use of salt only.

- *Utility Placement- Section 5.2.7*
    - Located within Right of Way.

- *Curbing- Section 5.4.15*
    - All streets shall be constructed with curbs but Commission and Town Engineer may waive curbs if applicant can demonstrate lack of curbs will not create an erosion condition, benefits wildlife, or portions of streets with less than 5% slope.

- *Drainage- Section 5.7*
    - Post-development peak discharge amount cannot exceed pre-development discharge conditions.
        - Commission can waive this requirement if applicant can demonstrate downstream drainage can adequately handle increased volume.
    - Development shall use best available technology to minimize off-site runoff, increase on-site infiltration, simulate natural drainage systems and minimize off-site discharge of pollutants, and encourage natural filtration functions.
    - No reference to specific LID Best Management Practices.

- *Septic systems- Section 5.3*
    - Separation standards:
        - Ledge: four feet.
        - Schist/Broken rock: four feet.
        - Molting: 40 inches.
        - Ground Water: four feet.

- *Subdivision open space requirements- Section 5.2.8*
    - Required 20% for all subdivisions.
    - Required 40% for OSCAR subdivision.
        - Extensive application procedures and design requirements for OSCAR.

- Provisions for configuring open space such that it combines with adjoining open space or forms a larger unified open space on adjacent land.
- Open Space may take form of active or passive recreation. If the Commission requires an applicant to improve a site for recreation uses then the open space dedication shall be reduced by 5%.
- Many ownership options for open space including Town owned Homeownership Association, Non-profit, and Applicant Ownership. In some cases applicant is responsible for management of open space.
- Fee-in-lieu of open space available with Commission's approval.

Marlborough Inland Wetlands and Watercourse Audit

- *Last Update: 1993- currently under review with a draft in hand.*

- *Upland Review Area- Section 2.17*
    - At least 150 feet for all wetlands or watercourses
    - 200 feet required for the several specified wetland areas that are referred to as Salmon River Corridor Wetland and Watercourse Conservation Area.
    - The Agency may regulate activity outside the Inland Wetland and Watercourse Area if the activity is determined to involve a significant effect on an Inland Wetland and Watercourse Area (Section 5.4).

- *Special Area of Review for Salmon River*
    - Yes, see above.

- *Overarching Issue for all Communities*
    - Need to have a discussion with local regulatory authority regarding how effective the application process is. Are the criteria specific enough? Is the information in the application requirements adequate to make the determinations?

APPENDIX C

Town of Marlborough Pre-Application Procedures

APPENDIX C: MARLBOROUGH, CT PRE-APPLICATION PROCEDURES

SECTION 3.0 PRE-APPLICATION PROCESS

3.1 Pre-Application Procedures

It is the policy of the Commission to encourage all applicants for all subdivisions and resubdivision to simultaneously initiate the pre-application procedures and requirements of these Regulations with both the Planning and Conservation Commissions. These procedures provide for an interactive approach to developing the subdivision plan. As a result, approval of the Final Application should be more timely and efficient. In the Pre-application Procedure active discussion with the subdivider is anticipated. In the Final Application Procedure, discussion with the subdivider will only occur at the request of the Commission. The purpose of the Pre-Application Procedure is to:

a) Provide for an exchange of ideas between the subdivider, the Commission and other Town Officials;

b) Respond to any questions regarding the substantive and procedural requirements of the Subdivision Regulations, Zoning Regulations, Plan of Conservation and Development and any other requirements;

c) Identify policies and regulations that create opportunities or restraints for the proposed development;

d) Review concept plans and consider opportunities to increase development benefits and mitigate undesirable project consequences;

e) Permit input into the general design of the project;

f) To provide the Commission with an opportunity to make a determination as to whether a site is developed as an O.S.C.A.R. Subdivision or as a conventional subdivision.

g) Before preparing an application for subdivision, the subdivider shall familiarize himself with the provisions of these Regulations, the Town of Marlborough Plan of Conservation and Development, the Zoning Map and Regulations, Town Ordinances, the Highway Construction and Design Standards, the Inland Wetland and Watercourse Regulations and the approved plans of adjacent subdivision, if any.

h) Delivery of the material specified below shall not constitute a formal or legal submission and, where the Pre-application procedure is optional, all of the material below will be expected by the Commission. Any suggestions or opinions rendered by the Commission or Town Staff are advisory only. Pre-application will be held with an understanding that the comments and suggestions made by the Commission will in no way imply approval of the final application.

i) Pre-application plans should be accompanied by a letter, request or other form of correspondence indicating the Pre-application procedure is being pursued and requested to be on a Planning Commission Meeting Agenda. Subject to normal work lead constraints, the Commission will make every effort to schedule the Pre-application discussion for the next Regular Meeting.

j) The applicant shall not be required to pay a fee for the pre-application review.

k) The application checklist, although not required, has been recommended to establish a basis of communication between the subdivider and the Commission.

3.2 Pre-Application Plan Requirements

Although the Commission has established minimal detail, accuracy and information requirements for Pre-application plans, drawings are expected to be of professional quality prepared by appropriate professionals. Nothing herein shall be construed to prevent an application from presenting maps and documentation in greater detail and containing more information to the Commission, if the applicant feels it is in his/her best interest to do so.

3.2.1 Pre-Application Plans:

A. Pre-application drawings shall generally be prepared at a scale that shall not be smaller than 1"- 40' but where amount of acreage or unusual land shape warrant, drawings may be at a scale of 1"=100'. Five (5) paper prints of the Pre-Application plans shall be submitted to the Planning Commission at least four (4) days prior to a Regular Meeting scheduled by the Commission for informal review, discussion and comment.

B. Alternatively, the developer may, at his option, present drawings which conform to the Final Plan Scale Requirements. The Pre-Application Plan shall contain the following information:

a) Streets to be constructed and existing streets within the subdivision with width of right-of-way and pavement and roadway slopes.

b) Boundary lines of the subdivision with accurate distances and bearings; number of acres in the total tract to the nearest tenth acre and the number of proposed building lots.

c) Proposed lots with approximate dimensions and areas in square feet containing the proposed locations of homes, wells, driveways, sub-surface sewage disposal areas and reserve area.

d) Proposed minimum required yards and minimum buildable lot areas based on the requirements of the Marlborough Zoning Regulations.

e) Proposed water, storm sewer and sanitary sewer lines and their connections with existing facilities.

f) Proposed locations of easements for utility lines, drainage improvements, sidewalks, rights of way, and open space lands.

g) Areas to be reserved for public use and notation of any type of development proposed for public land, if any.

h) Agricultural and conservation easement areas within the subdivision, if any.

i) The location of all major trees (18" caliper, 3' off ground), distinctive stands of trees, specimen trees, trees of unusual variety for the area, walls, existing structures, ledge outcrops, ridge lines, scenic vistas, sites of historic or archeological value or other physical features of significance.

j) Topographic data at two (2) foot contour intervals and the location of all Inland Wetland and Watercourse Conservation Areas, as defined in the Marlborough Inland Wetland and Watercourse Regulations delineated by a State of Connecticut Certified Soil Scientist.

k) If any part of the subdivision falls within 1,000 feet of a state grid coordinate reference point, the subdivision boundary shall have reference to that point.

l) Indication of Zone District boundaries properly dimensioned with zone designations.

m) Title Block indicating the name of the owner, subdivider, subdivision, scale, date, north arrow, legend, and the name of the engineer and/or surveyor responsible for plan preparation.

n) When a Pre-application Plan covers only a portion of the subdivider's entire holding, a sketch of the prospective future street and lot layout in the entire holding shall be furnished in the form of a key map at scale of 1"=200'.

o) The drawings shall be based on a class A-2 Survey, which shall be clearly indicated by a note on the drawings.

p) A print of the Hartford County Soils Survey showing soil classifications as they relate to the proposed subdivision is recommended. Where there is a question about soil classification, it is recommended that the developer contact the Hartford County Soil and Water Conservation District before Pre-application.

q) Percolation tests, deep test pit results, and their locations shall be presented as part of the Pre-application Procedure.

APPENDIX D

Development Application Checklists

Development Application Checklists

Town of Bolton

BOLTON PLANNING AND ZONING COMMISSION
CHECKLIST
FOR SUBDIVISION & RESUBDIVISION APPLICATIONS
Revised March 11, 2009

THIS CHECKLIST MUST BE COMPLETED BY THE APPLICANT OR AN AUTHORIZED REPRESENTATIVE AND SUBMITTED WITH THE APPLICATION.

The Planning and Zoning Commission will use this checklist in determining the completeness or incompleteness of the application. The applicant is responsible for providing all the applicable information on this checklist. The applicant is encouraged to provide any additional information to clearly present a proposed activity and its potential effects on the community. The Commission may require additional information not included in this checklist to determine compliance with the regulations.

AN APPROVAL OF AN APPLICATION COULD BE DENIED IF AN APPLICATION LACKS SUFFICIENT INFORMATION.

WAIVERS. Some of the items below are essential for any application while others may not be applicable for a particular proposal. The applicant is encouraged to ask the town staff to review the completed application with all supporting information and the completed checklist, prior to submitting the application to the Planning and Zoning Commission so that the staff can provide the applicant an opinion on the completeness of the application. The applicant shall provide an accompanying narrative for any item that is represented by the applicant as not applicable or not included. Should the applicant intend to seek a waiver of any requirement of the Bolton Subdivision Regulations pursuant to Section 1.3, the applicant shall submit an itemized request listing each such waiver with a statement justifying such request at time of application.

SUPPLEMENTAL REVIEW FEES: The applicant may be liable for supplemental review fees to defray the cost of professional review services, such as engineering, legal, and traffic reviews. Staff will seek estimates of these professional services at time of application acceptance. Please see the attached fee schedule.

Name of Subdivision or Resubdivision: _____

Applicant _____ Date _____

Item	Description	Applicant		Staff	
		Included	Not Included	Completeness Opinion	
				Yes	No
1	Completed, signed application by applicant and owner				
2	Payment of required application fees				
3	All draft deeds, easements and declarations for all proposed roads, road widenings and open spaces, letter of consent from entity to receive open space and easements for drainage, conservation, driveways, utilities				
4	Evidence of Approval by the Health District and/or Sewer Authority				
5	Evidence of approval of the proposed activity by the Inland Wetlands Commission if it is within that Commission's jurisdiction				

Item	Description	Applicant		Staff	
		Included	Not Included	Completeness Opinion	
				Yes	No
6	Evidence of approval by the Fire Marshal and Fire Chief of the water supply for fire protection				
7	Copies of any required applications for other local, state or federal regulatory approvals				
8	Written evidence of applicant's legal interest in the subject property (deed, lease, option to purchase, bond for deed, etc.)				
9	List of all current property owners within 500 feet of the subject property obtained from the Town Assessor records.				
10	Paper and digital copies of all reports including hydrology, hydraulic and drainage computations and				
11	14 sets of complete stamped and signed plans measuring 24" x 36", and at a scale not more than 40' to the inch				
	ITEMS 12 THROUGH 65 SHALL BE INCORPORATED IN THE SET OF PLANS				
12	A-2 boundary survey of the subject property showing all existing and proposed boundary lines and markers, easements, adjoining property lines and the names of all current abutting property owners				
13	Subdivision owner's name and address, total area of subdivision and number of lots, shown on plan				
14	Digital copy of plans in DXF, DGN, or other format acceptable to Town staff				
15	Plan title block in the extreme lower right corner (not sideways) to include the subdivision name, individual sheet title and the name of the Town of Bolton				
16	All plan sheets numbered with the format "sheet x of y"				
17	Clear legible plans with all lines, symbols and features readily identifiable				
18	North arrow on each plan including the reference meridian				
19	Graphic bar scale on each plan sheet, within the acceptable scale limits of the regulations				
20	Overall plan of site at a smaller scale, with sheet index, if the site does not fit on one sheet at required scale				
21	Key map at a scale of 1"= 500' showing the relation of the site to abutting properties and streets, shown on plan				
22	Original and revision plan dates and revision explanations shown on the affected plan sheets				
23	Total area of Subdivision				
24	Square footage and acreage of all lots, roads, open spaces, easements, etc.				
25	Number of lots in Subdivision				
26	Existing and proposed property and street lines				
27	Existing and proposed watercourses and ponds				
28	Existing and proposed easements and ROWs				
29	Existing and proposed lot markers and lot numbers				
30	Proposed Street numbers				

Item	Description	Applicant		Staff	
		Included	Not Included	Completeness Opinion	
				Yes	No
31	All dimensions to 1/100th of a foot, and all bearings or angles on all property lines and easements, existing and proposed.				
32	Central angle, arc length, and radius of all arcs				
33	Width of streets, ROWs, and easements				
34	Proposed street names				
35	Existing and proposed street monuments				
36	Length of proposed streets				
37	Survey relationship of proposed streets to Town roads or State Highways				
38	Revision number, date, and brief description of revision				
39	Commission's endorsement signature block on each plan sheet in accordance with Section 8.t.				
40	Existing and proposed parks, recreation areas, and open spaces				
41	Existing and proposed grading with two foot contours for all ground surfaces based on USGS datum, shown on plan				
42	Existing and proposed structures and features, their uses and those to be removed, shown on the plan				
43	Existing and proposed driveway entrances to street				
44	Sight distances from property entrances along public roads shown on plan and on profile if grading is needed				
45	Existing and proposed water supply shown on plan				
46	Existing wells and sewage disposal systems on other properties that could conflict with proposed site improvements, shown on plan				
47	Existing and proposed footing drains, curtain drains and dry wells, shown on plan				
48	Existing and proposed drainage systems, any affected floodway and construction detail drawings, shown on plan				
49	Existing stone walls, fences, trails, foundations and other similar landmarks, shown on plan				
50	Existing and proposed bridges and culverts on or adjacent to the site, shown on plan				
51	Zoning district boundaries and zoning dimensions table				
52	Table shown on plan of zoning dimensions required and provided for lot area, street frontage, lot width, yard setbacks, impervious area and building coverage				
53	Location of minimum buildable area for each lot, shown on plan				
54	Limits of wetlands as delineated by a certified soil scientist with the soil scientist's signed certification, shown on plan or a certification signed by a soil scientist that no wetlands are within 100 feet				

Item	Description	Applicant		Staff	
		Included	Not Included	Completeness Opinion	
				Yes	No
55	Natural features including watercourses, ponds, vernal pools, aquifers, 100 year flood plain areas, ridge lines, large ledge outcrops, slopes steeper than 25% and potential areas of endangered species, shown on plan				
56	Soil deep test hole and percolation test locations and soil test results				
57	Conceptual design and locations of principal structure, primary and reserve sewage disposal areas each with percolation and deep test holes for suitable soils, curtain and footing drains with outlets, and well; location of existing septic systems and wells on property and abutting properties that impact location of new wells and septic systems.				
58	Existing and proposed streets within the ROW, edges of pavement, centerline, station numbers				
59	Driveway locations				
60	Signature and seal of engineer and surveyor preparing map				
61	Traffic control signs, pavement markings, street lights				
62	Plan and profile construction drawings at 1”=40’ (H) scale and 1”=4’ (V) scale for all the features of proposed roads, drainage systems and public improvements with construction detail drawings for all features in accordance with the regulation requirements				
63	Best management practices to remove contaminants, including sediments and oils, from runoff water, shown on plan, in construct detail drawings, and explained in a report by a qualified professional				
64	Landscaping Plan				
65	Erosion and Sedimentation Control Plan, with narrative and construction detail drawings, in accordance with the latest Connecticut Guidelines for Soil Erosion and Sediment Control				
66	Thorough, well-organized drainage design report for existing and proposed development conditions, that conforms to the latest Conn. Dept. of Transportation and Conn. Dept. of Environmental Protection guidelines and requirements with appropriate calculations, maps, graphics and narrative descriptions of hydrology, hydraulics, assumptions, erosion controls, drainage paths and systems for the 1, 2, 10, 50 and 100 year storm events				
67	Statement in drainage report that the after development flows for all storm events do not exceed the before development flows				
68	Engineer’s itemized cost estimate (including item, quantity, and price) for the installation of all erosion and sediment controls based on current published Connecticut DOT unit prices				

Item	Description	Applicant		Staff	
		Included	Not Included	Completeness Opinion	
				Yes	No
69	Engineer's itemized cost estimate (including item, quantity, and price) for the construction of all public improvements based on current published Connecticut DOT unit prices				
70	Open Space Proposal: Open Space Conservation Development, Traditional Development or Fee-In-Lieu-of-Open-Space with Land Appraisal prepared by appraiser mutually agreeable to Commission and applicant				
71	Written evidence from receiving entity that it is willing to accept, preserve and maintain open space				

BOLTON PLANNING & ZONING COMMISSION
CHECKLIST FOR SITE PLAN REVIEW (§ 16A)
AND SPECIAL PERMIT (§ 16B) APPLICATIONS

March 11, 2009

THIS CHECKLIST MUST BE COMPLETED BY THE APPLICANT OR AN AUTHORIZED REPRESENTATIVE AND SUBMITTED WITH THE APPLICATION.

The Planning and Zoning Commission will use this checklist in determining the completeness or incompleteness of the application. The applicant is responsible for providing all the applicable information on this checklist. The applicant is encouraged to provide any additional information to clearly present a proposed activity and its potential effects on the community. The Commission may require additional information not included in this checklist to determine compliance with the regulations.

AN APPROVAL OF AN APPLICATION COULD BE DENIED IF AN APPLICATION LACKS SUFFICIENT INFORMATION.

Some of the items below are essential for any application while others may not be applicable for a particular proposal. The applicant is encouraged to ask the town staff to review the completed application with all supporting information and the completed checklist, prior to submitting the application to the Planning and Zoning Commission so that the staff can provide the applicant an opinion on the completeness of the application.

Pursuant to Section 16A.2.p, at time of application submission, the applicant may request in writing that the Commission determine that all or a part of the information required under Section 16A.2.c through o. (except subsections e., f., i., and j.) is NOT necessary in order to decide on an application.

Applicants may be subject to supplemental review fees to defray the costs of professional review services such as engineering or legal reviews. Please see attached information sheet.

Name of Development _____

Applicant _____ Date _____

Item	Description	Applicant		Staff	
		Included	Not Included	Completeness Opinion	
				Yes	No
1	Completed, signed application by applicant and owner				
2	Payment of required application fees				
2A	Statement of Use in accordance with **§** 16A.2.b				
3	All draft deeds for any roads, road widenings and easements for drainage, conservation, driveways, utilities				
4	Evidence of request for approval by the Health District and/or Sewer Authority for review, as appropriate				
5	Evidence of submission of application to the Inland Wetlands Commission if it is within that Commission's jurisdiction				
6	Evidence of submission of a request for review and approval by the Fire Marshal and Fire Chief of the water supply for fire protection				
7	Copies of any required applications to other local, state or federal regulatory approvals				
8	Written evidence of applicant's legal interest in the subject property (deed, lease option to purchase, bond for deed, etc.)				

Item	Description	Applicant		Staff	
		Included	Not Included	Completeness Opinion	
				Yes	No
9	List of mailing address of all current property owners within 500 feet of the subject property, from the Town Assessor records (for special permit only)				
10	List of all hazardous or potentially hazardous materials which will be present on the property with a full description of procedures that will be used to assure safety with the material safety data sheets				
12	Digital copy of plans in DXF or DGN format if available				
13	Paper and digital copies of all reports including hydrology, hydraulic and drainage computations and				
14	14 sets of complete stamped and signed site plans measuring 24" x 36				
	THE FOLLOWING ITEMS 15 THROUGH 51 SHALL BE INCORPORATED IN PLANS				
15	A-2 boundary survey of the subject property showing all existing and proposed boundary lines and markers, easements, adjoining property lines and the names of all current abutting property owners				
16	Names of abutting lot owners				
17	USDA Soils boundaries and types				
18	Plan title block in the extreme lower right corner (not sideways) to include the name of the town of Bolton				
19	All plan sheets numbered with the format "sheet x of y"				
20	Clear legible plans with all lines, symbols and features readily identifiable				
21	North arrow on each plan including the reference meridian				
22	Graphic bar scale on each plan sheet, not smaller than 1"= 40' unless otherwise approved by the Commission				
23	Overall plan of site at a smaller scale, with sheet index, if the site does not fit on one sheet at a scale of 1"=40'				
24	Key map at a scale of 1"= 500' showing the relation of the site to abutting properties and streets, shown on plan and zoning district boundaries within 500' of site				
25	Original and revision plan dates and revision explanations shown on the affected plan sheets				
26	Existing and proposed grading with two foot contours to T-2 standards, for all ground surfaces, shown on plan				
27	Existing and proposed structures and features, their uses and those to be removed, shown on the plan				
28	HVAC equipment located outside the building(s)				
29	Existing and proposed driveway entrances to street, parking, loading areas, fire lanes, sidewalks and construction detail drawings, shown on plan				
30	Sight distances from property entrances along public roads shown on plan and on profile if grading is needed				
31	Soil test locations and soil test results shown on plan				
32	Existing and proposed sewage disposal systems and design information, shown on plan				
33	Outside Storage Areas				

Item	Description	Applicant		Staff	
		Included	Not Included	Completeness Opinion	
				Yes	No
34	Underground / overhead utilities, existing and proposed				
35	Existing and proposed water supply shown on plan				
36	Existing wells and sewage disposal systems on other properties that could conflict with proposed site improvements, shown on plan				
37	Existing and proposed footing drains, curtain drains and dry wells, shown on plan				
38	Existing and proposed drainage systems, any affected floodway or floodplain and construction detail drawings, shown on plan, including base flood elevation and floor elevation data.				
39	Existing and proposed bridges and culverts on or adjacent to the site, shown on plan				
40	Existing and proposed signs with dimensions and construction detail drawings, shown on plan				
41	Existing and proposed fences and walls with dimensions and construction detail drawings, shown on plan				
42	Zoning district boundaries affecting the site, shown on plan				
43	Table shown on plan of zoning dimensions required and provided for lot area, street frontage, lot width, yard setbacks, impervious area, building coverage and the height and floor area of each building				
44	Table on plan of parking / loading spaces required / provided				
45	Fire lanes				
46	Sidewalks and other pedestrian ways				
47	Off-site traffic improvements				
41	Limits of wetlands as delineated by a certified soil scientist with the soil scientist's signed certification, shown on plan or a certification signed by a soil scientist that no wetlands are within 100 feet				
42	Natural features including 100 year flood plain areas, ponds, vernal pools, aquifers, slopes steeper than 25% and potential areas of endangered species, shown on plan				
43	Landscaping plan including the locations, numbers, installed sizes, anticipated mature sizes, species and common names of proposed plants plus cost estimate based on published Connecticut DOT unit prices				
44	Existing trees of 6" caliper or greater				
45	Significant archaeological sites				
46	Lighting plan including the location, size, height, light intensity coverage areas and manufacturer's product descriptions for each light type				
47	Erosion and Sedimentation Control Plan, with narrative and construction detail drawings, in accordance with the latest Connecticut Guidelines for Soil Erosion and Sediment Control				

Item	Description	Applicant		Staff	
		Included	Not Included	Completeness Opinion	
				Yes	No
48	Best management practices to remove contaminants, including sediments and oils, from runoff water, shown on plan, in construct detail drawings, and explained in a report by a qualified professional				
49	Architectural elevation drawings of proposed buildings				
50	Architectural floor plans of existing and proposed buildings				
51	Perspective color drawings or digital views of the site as seen from adjacent roads and from abutting property lines showing the proposed conditions including buildings, landscaping and appurtenant features				
52	Traffic Impact Report for applicable sites as described in Zoning Regulations Section 16A.2.k.				
53	Thorough, well organized drainage design report for before and after development conditions, that conforms to the latest Conn. Dept. of Transportation and Conn. Dept. of Environmental Protection guidelines and requirements with appropriate calculations, maps, graphics and narrative descriptions of hydrology, hydraulics, assumptions, erosion controls, drainage paths and systems for the 1, 2, 10, 50 and 100 year storm events				
54	Statement in drainage report that the after development flows for all storm events do not exceed the before development flows				
55	Sanitary Waste Disposal Plan (if community sewerage system)				
56	Evaluation of the impact of proposed development upon existing and potential public surface and ground drinking water supplies, pursuant to CGS, Section 8-2				
57	Certified copy of Certificate of Public Convenience and Necessity in connection with a “water company”, in accordance with CGS, Section 8-25a				
58	Existing and proposed Covenants or Restrictions				
59	Engineer’s itemized cost estimate for the installation of all erosion and sediment controls based on published Connecticut DOT unit prices				
60	Engineer’s itemized cost estimate for site improvements based on published Connecticut DOT unit prices as basis for the establishment of a completion bond				

Development Application Checklists

Town of Columbia

Site/Subdivision Plan Review for Compatibility with Columbia Plan of Conservation and Development[1]

The purpose of this worksheet is to foster the applicant's awareness of the Columbia's POCD, so that the application will meet the stated goals of the POCD and thus avoid costly and time-consuming plan revisions.

PROJECT NAME/DESCRIPTION:

PROPOSED LOCATION:

CURRENT OWNER'S NAME AND ADDRESS:

TOTAL ACRES:

EXISTING SURVEY: #_____ **DATE WORKSHEET WAS COMPLETED:**

POINT OF CONTACT FOR PROJECT (Name, address, phone number):

NA[2]	RESOURCE	Proposed Site Contains/is Adjacent to: (check all applicable boxes, and fill in the blanks)	CONSIDERATIONS	RECOMMENDATIONS to be completed by the Conservation Commission
	1. Scenic Resources Map on Page 20	❑ Scenic Vista ❑ Part of Scenic View shed ❑ Ridge line[3] ❑ Frontage on Route 87 ❑ Stone walls _____ (linear ft)	• Protect the rural character of the Town • Protect scenic and historic character of Route 87 • Preserve scenic ridge lines • Maintain visibility of attractive agricultural features, including barns, silos and other out buildings • Preserve roadside open fields and meadows • Preserve roadside trees of a diameter greater than 15 inches • Preserve stone walls • Create wooded buffers concealing development from roadway • Create landscape buffers at town-owned and commercial sites along Route 6 & 66	
	2. Cultural and Historic Resources Maps on Page 22 & 23	❑ National Register (# of structures) _____ ❑ CT Register (# of structures) _____ ❑ Local Historic District ❑ Historic site (describe in Comments) ❑ Existing/potential archaeological features (describe in Comments) ❑ State Archaeologist has reviewed the site	• Preserve historical & agricultural structures by rehabilitation and adaptive re-use • Preserve Columbia's Historic District • Preserve archaeological sites • Conduct review for archaeological sensitivity • Protection of possible archaeological sites from disturbance prior to a review being completed	

	3. Soil Resources Maps on Page 28 and 31	❑ Prime agriculture soils _____ % ❑ Current agricultural use (list in Comments) ❑ Wetlands _____% ❑ Steep slopes (>20%) _____% ❑ Bedrock at surface _____% ❑ Existing sources of potential pollution[4] ❑ Potential pollution from proposed uses (list in Comments) ❑ Planned removal of soil resources (list in Comments)	• Foster continued agricultural use of prime farmland soils • Prioritize prime farmland soils for open space protection • Restrict development in problem soil areas • Minimize soil disturbance to protect natural values • Minimize erosion and sedimentation	
	4. Water/ Wetlands Resources Map on Page 47	Name of drainage basin _____ ❑ Priority wetlands _____ (area) ❑ Watercourses ❑ Vernal pools ❑ Stratified drift aquifers ❑ Flood Plain (FEMA 100 Yr.) ❑ Columbia Lake Watershed Zone (A, B or C) _____ ❑ Regulated activities[5] (permit expiration date or list activities in Comments)	• Protect quantity and quality of drinking water supplies • Maintain vegetated buffers along priority wetlands and watercourses • Minimize impervious surface • Use natural filtration (bio-retention methods for storm water management) • Protect all stratified drift aquifers over 10 feet deep • Protect quality and accessibility of recreational waters.	
	5. Living Resources Map on Page 53	❑ Priority forest habitat _____ (area) ❑ Wildlife corridor _____ (linear ft.) ❑ Mature forest (30 yrs. or older) ❑ Fishery (watercourse stocked by DEP) ❑ Invasive species (list in Comments) ❑ Endangered, rare or species of special concern (describe or list in Comments)	• Protect habitat areas for Columbia's game and non-game wildlife, including large, un-fragmented forest blocks. • Minimize area of disturbance • Minimize habitat fragmentation • Protect wildlife corridors and priority forest habitat, through easement or acquisition • Promote use and preservation of native plants and enforce the State ban of invasive species • Protect unique or sensitive environmental resources	
	6. Open Space Map on Page 44	❑ Committed open space acres #_____ ❑ Proposed Committed open space acres #_____	• Protect sites that abut or serve to connect existing dedicated or public open space	

	7. Recreation Map on Page 116	❑ Quality finfish habitat ❑ Passive recreation opportunities (list) ❑ Active recreation opportunities (list) ❑ Existing or proposed trail(s)	• Protect sites that provide opportunities for passive recreation such as hiking, biking, nature study, cross country skiing, canoeing or kayaking, fishing and hunting • Protect sites suitable for active recreation as identified and prioritized by a Recreation Commission	
	8. Impact Summary	❑ Developed / cleared area _____% ❑ Impervious surface Current _____% Proposed _____%		

COMMENTS SECTION: Please provide additional information on a separate sheet , if applicable.

Item 2. (a) Describe historic property:

(b) Describe existing/potential archaeological features:

Item 3. (a) Describe current agricultural use:

(b) Describe sources of potential pollution and proposed controls:

(c) List types and amount of soil resources to be removed:

Item 4. List regulated activities:

Item 5. (a) List Invasive Species:

(b) List endangered, rare or species of special concern

Item 6. Provide additional information you think would be useful.

Please make sure that your submitted plan reflects how your design meets the goals listed under the heading *Considerations* on this form. You may submit this information in written form with this worksheet or include it on the actual site plan.

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[1] All page references refer to the Plan of Conservation and Development for the Town of Columbia, CT. Also see this document for additional information on goals and recommendations. A copy of the Plan on CD in PDF form can be obtained from the Columbia Town Hall, or downloaded from the Town Website at www.columbiact.org.

[2] Not applicable. Put an "**X**" in this column if none of these resources exist or are adjacent to the proposed location

[3] A ridge line is a location 40 feet or more above the surrounding topography

[4] Previous landfill site, use involving hazardous chemicals, fuel tanks 20 years or older

[5] See Columbia Wetlands Regulations

Development Application Checklists

Town of East Haddam

EAST HADDAM PLANNING AND ZONING COMMISSION

APPLICATION FOR PRELIMINARY
SUBDIVISION/RESUBDIVISION REVIEW

TITLE FOR SUBDIVISION/RESUBDIVISION _____

APPLICANT'S NAME: _____
ADDRESS:_____ PHONE: _____

OWNER'S NAME: _____
ADDRESS: _____

ASSESSOR'S MAP #_____ LOT # _____ ZONE/DISTRICT _____
STREET: _____ ACREAGE _____ # OF LOTS _____

SURVEYOR:_____ PHONE _____
ADDRESS _____

ENGINEER:_____ PHONE _____
ADDRESS: _____

SOIL SCIENTIST: _____ PHONE _____
ADDRESS: _____

LANDSCAPE ARCHITECT: _____ PHONE _____
ADDRESS: _____

ENVIRONMENTAL CONSULTANT: _____ PHONE _____
ADDRESS: _____

DATE: _____

_____
APPLICANT / OWNER SIGNATURE

_____
AGENT SIGNATURE

Date Received: _____

Date of Preliminary Hearing _____

APPLICATION REQUIREMENTS/POLICIES

____ a) Application. The Subdivider, hereinafter sometimes called the Applicant, may present to the Commission a request for the consideration of the Preliminary Layouts. Six (6) paper prints of each of the Preliminary Layouts (Conventional versus Conservation), in accordance this Section 3.03.h of these Regulations, shall be submitted with the request.

_____ b) Technical Reports. The Applicant shall obtain from a licensed professional engineer a written report or reports as to the general feasibility of the following: The proposed water supply, and the proposed drainage plan and sewage disposal in the area to be subdivided, and shall deliver said report(s) to the Commission. The Applicant shall demonstrate where the proposed development fits within the watershed, ie. regional, subregional, and local drainage basins. The applicant shall cause to be performed, at his expense, such tests as the appropriate Town officer or officers may request. The Commission may request such other report(s) as are deemed advisable.

_____ c) Check by Commission. At the time of the filing of a request for the consideration of the Preliminary Layouts, the Commission or its designee shall check such request and layouts and when the information contained in said request is substantially complete in accordance with this Section of these Regulations, the matter shall be placed on the agenda for a regular public meeting of the Commission. The applicant's agents shall certify that the information contained in the request and layouts is true and correct and meets the requirements of these Regulations and any other applicable town or state regulations. Whenever desirable, the Commission and/or its representative(s) may examine the site of the proposed subdivision with the applicant or his authorized representative(s), prior to said meeting, and the applicant, by making a request under this Section, shall be deemed to consent to such site examination.

_____ d) Notice of the Meeting with the Commission. The Commission shall notify the applicant, prior to said meeting, of the date, time and place of the meeting of the Commission at which the Preliminary Layouts are to be considered and the applicant, or his fully authorized representative, should attend said meeting unless he has notified the Commission at least one day prior to said meeting of his inability to attend. All Preliminary Layout and reviews require the property to be posted with notice of such meeting. The requirements of such notification are explained in Section 4.20 General Requirements

_____ e) Consideration of the Preliminary Layouts. The Preliminary Layouts will be considered at a regular public meeting of the Commission at which it is on the agenda. The Commission may hold a public hearing on any such request, and even in the absence of a public hearing, may, in its sole discretion, permit persons to be heard and written communications received at such meeting. The purpose of entering information from the public is to gather certain information such as environmental, historical, and archeological factors that may assist the Commission and applicant in the decision making process.

_____ f) The Commission shall have the right to recommend the subdivision method (Conventional or Conservation) based on the information provided in the preliminary layouts provided by the applicant and from comments generated from other Commissions, Boards, Agencies, and the public.

_____ g) Effect of Consideration of Preliminary Layouts. The purpose of the consideration of the Preliminary Layouts is to provide preliminary guidance to the Applicant, and to identify areas

of concern or further study, so as to minimize delay, expense and inconvenience to the public, the Applicant, and the Commission upon the future receipt, if any, of a formal application for subdivision. Neither the applicant nor the Commission shall be in any way bound by any statement made during such Preliminary Layout consideration, nor shall the statement of any Commission member be deemed to be an indication of pre-judgment or prejudice, it being acknowledged by the applicant that the Commission's responses, like the request itself, are preliminary and subject to further change and refinement. There shall be no vote or other formal action on any request for Preliminary Layout consideration, other than referrals to other municipal, State, or Federal agencies for review and comment if deemed advisable by the Commission.

_____ h) Preliminary Layouts submitted to the Commission should be drawings or prints of drawings produced by a landscape architect, engineer, or surveyor at a scale of one inch equals forty feet (1"=40') or one hundred (100') feet on sheets twenty-four by thirty-six inches (24"x36") in size. It is recommended that on complex projects that, at the minimum, the services of an landscape architect, engineer, surveyor, and biologist be contracted as part of the project team for presentation. The Preliminary Layout shall contain the following information:

_____ i). Names of owners of record and proposed subdivider, proposed subdivision name and identifying title, location of subdivision, approximate north arrow and scale and date of drawing.

_____ ii). Location and approximate dimensions of all existing property lines of the subdivision including assessor's map and lot numbers.

_____ iii). All pertinent features, such as existing structures, stonewalls, foundations, easements, wetlands, watercourses, swampland and wooded areas, and proposed Conservation Areas properly labeled.

_____ iv). Approximate contours of the existing surface of land, with intervals adequate to indicate drainage and grades.

_____ v). Proposed lot lines with approximate dimensions and area of all proposed lots

_____ vi). Location and approximate dimensions and area of all property proposed to be set aside for open space, playground or park use.

_____ vii). A reference map to the scale of one inch equals one thousand feet (1"=1000') showing the proposed subdivision and tie-in to the nearest street intersection. If the application submitted covers only a part of the applicant's holdings, a map which may appear on the same sheet, drawn on a scale no less than one inch equals two hundred feet (1"=200') showing an outline of the plotted area with its proposed road system and an indication of a proposed future road system and lot layout for the remaining portion of the tract.

_____ viii). A set of maps demonstrating how the four step conservation development process of Section 3.02 was used. (See below)

_____ ix). Where the subdivider anticipates that the Subdivision will be developed in phases, such phases should be delineated on the Preliminary Layout.

_____ x). Mapping and a narrative describing the use of the four step development process for a Conventional and Conservation Plan. (See next page)

_____ xi). Maps indicating where the development exists in relationship with the watershed, ie regional, subregional, and local basins.

____ Consideration of Conservation Plan and use of the four step development process.

i) The applicant shall use the four step process to create the proposed Conventional and Conservation Subdivisions. This process shall be demonstrated with a site plan and detailed narrative. The design process identifies historical, cultural and natural resources, potential open space corridors, views and vistas, sensitive wildlife areas, Conservation Areas, and other areas that should not be adversely impacted by development.

Step One: Identifying Conservation Areas

Conservation Areas limited to regulatory jurisdiction such as wetland and floodplains; and Conservation Areas including those unprotected elements of the natural landscape such as steep slopes (20% or greater), mature or productive forestland, potential contiguous open space or connective green belts, prime farmland, land that protects critical or threatened species or communities of special concern as identified by the Department of Environmental Protection, areas that have recreation value as recommended in the Recreation and/or Open Space Plan component of the Plan of Development; wildlife habitats, and cultural features such as historic and archeological sites; and scenic views and vistas. This phase will require the property boundary to be located, the wetland areas delineated, and the services of professionals such as a biologist and/or a landscape architect to determine the potential Conservation Area.

Step Two: Locating Developable House Sites

The second step involves locating approximate house sites on suitable soils outside of the Conservation Areas. Random soil testing throughout the property in a grid of approximately 200 feet apart will give a general indication of the areas suitable for development.

Step Three: Aligning Streets and Driveways

The third step consists of tracing a logical alignment for the location of streets to serve the house sites, which street pattern is in harmony with the natural topography to minimize cuts and fills.

Step Four: Drawing in the Lot Lines

The final step is to draw in the lot lines.

EAST HADDAM PLANNING AND ZONING COMMISSION

SUBDIVISION APPLICATION

SUBDIVISION/RESUBDIVISION REVIEW

TITLE FOR SUBDIVISION/RESUBDIVISION _____

APPLICANT'S NAME: _____
ADDRESS:_____ PHONE: _____

OWNER'S NAME: _____
ADDRESS: _____

ASSESSOR'S MAP #_____ LOT # _____ ZONE/DISTRICT _____
STREET: _____ ACREAGE _____ # OF LOTS _____

SURVEYOR:_____ PHONE _____
ADDRESS _____

ENGINEER:_____ PHONE _____
ADDRESS: _____

SOIL SCIENTIST: _____ PHONE _____
ADDRESS: _____

LANDSCAPE ARCHETECT: _____ PHONE _____
ADDRESS: _____

ENVIRONMENTAL CONSULTANT: _____ PHONE _____
ADDRESS: _____

DATE: _____ _____
APPLICANT / OWNER SIGNATURE

Date Received: _____
Date Accepted Complete by PZC _____
Date of Hearing _____
Date of Decision _____
Bond Amount _____

Address every section even if it does not apply.
Please refer to the East Haddam Subdivision Regulations to insure your application is complete.

APPLICATION REQUIREMENTS/POLICIES

a) Filing of Final Subdivision Application. Any Applicant seeking Subdivision approval shall file in the office of the Commission the following (in duplicate, unless otherwise noted). If the Applicant does not participate in the preliminary application process, the applicant shall submit full sets of a Conservation and Conventional Subdivision Plan. The Commission shall have the right to choose the subdivision method (Conventional or Conservation) based on the information provided by the applicant and from comments generated from other Commissions, Boards, Agencies, and the public:

_____ i). An application on forms provided by the Commission, signed by the applicant and also the owner of the land to be subdivided or his authorized agent;

_____ ii). A non-refundable application fee, in the form of a check made payable to the Town of East Haddam per the Town Fee Ordinance;

_____ iii). Ten (10) prints of a Final Subdivision Plan conforming to these Regulations;

_____ iv). Ten (10) prints of a Plan and Profile drawings for each street conforming to these Regulations. (Scale: 1" = 40' horizontal, 1" =4' vertical);

_____ v). Three copies of a Hydraulic Study and Stormwater Control Plan conforming to these Regulations;

_____ vi) Ten (10) prints of an Erosion and Sediment Control Plan, in accordance with the 2002 Connecticut Guidelines for Soil and Erosion Control as amended. The plan shall relate only to proposed improvements.

_____ vii) Ten (10) prints of a Final Subdivision Plan conforming to these Regulations reduce to 11" x 17" for distribution to the Commission and public;

_____ viii A final report from the Sanitarian indicating that each and every lot proposed on the Final Subdivision Plan meets the sanitary requirements as defined in Section 4.04; or, if the applicant proposes to utilize a community sewerage system, as defined in the Connecticut General Statutes Section 7-245, a report from the East Haddam Water Pollution Control Authority indicating that all requirements of the Connecticut General Statutes Section 7-246f have been satisfied;

_____ ix) A report from, and evidence of approval by, the Inland Wetlands and Watercourses Commission of any permits required pursuant to the East Haddam Inland Wetlands and Watercourses Regulations for the Final Subdivision Plan as submitted; and, in addition, written evidence of a preliminary review of the proposed activities depicted on the Final Subdivision Plan by the U.S. Army Corps of Engineers or Department of Environmental Protection where required by applicable law.

_____ x) In accordance with Section 8-25a of the Connecticut General Statutes, as amended by Public Act 84-330, any subdivision providing water by means of a "water company", as that term is defined in Connecticut General Statutes Section 16-262m(a), shall provide to the Commission a certified copy of a resolution from the Board of Selectmen agreeing that the Town of East Haddam through the East Haddam Water Pollution Control shall be responsible for the ownership and operation of the subject water company as required by the Department of Public Utility Control Regulations (DPUC) and that a Certificate of Public Convenience and Necessity is issued by the DPUC.

_____ xi) A written, itemized estimate, prepared and sealed by the applicant's Connecticut Registered Professional Engineer, of the cost of installation of any and all Improvements depicted on the Final Subdivision Plans or required by these Regulations. Such written estimate shall contain a detailed analysis of the materials and services required, the cost per unit, and such other information as the Town Engineer may require to facilitate his/her review of the estimate. The Town Engineer shall review the estimate, and make a recommendation to the Commission that it be accepted with or without modifications.

_____ xii) Each sheet of the Final Subdivision Plans shall contain a printed signature box as follows;

Approved by the East Haddam Planning and Zoning Commission
Chairman/Secretary _____ Date:_____
Expiration Date: _____

_____ xiii) Where the proposed subdivision includes only a portion of an existing tract, or only a portion of the applicant's property, a preliminary plan of the future street and lot pattern for the remainder of the tract or property shall be submitted.

_____ xiv) Where existing topography is proposed to be altered, the volumes of material to be removed from, or brought onto, the site; areas of proposed blasting, and the estimated volume thereof; the location to which excavated material being removed from the site will be deposited, if known, and the time within which such removal is anticipated to occur.

_____ xv) A description of any existing deed restrictions, covenants, easements, rights-of-way, or similar encumbrances which run with the land, including the identity of the dominant and servant estates, the volume and page of the East Haddam Land Records where the same are recorded, and the date upon which they will expire, if any.

_____ xvi) The name, address, responsible loan officer of the holder, and volume and page of recording, of any mortgage deed secured by the property to be subdivided.

_____ xvii) A parcel history map, depicting the tract as of the effective date of the adoption of subdivision regulations for the Town of East Haddam (September 5, 1961). Such map shall be at a scale of 1" = 200', more or less, and shall indicate all divisions of the property, or any property of which was formerly a part, since the said effective date of subdivision regulation in East Haddam and a table containing the dates of such divisions and the grantors and grantees of any parcels or approved subdivisions so created.

_____ xviii) In accordance with C.G.S. §8-3i, in any subdivision application for any property which is within the watershed of a water company, as defined in C.G.S. The Commission shall schedule a public hearing as provided by Statute on any application for Final Subdivision. Any such public hearing shall commence no later than sixty-five (65) days following the Date of Receipt of the application, and shall be completed no later than thirty-five (35) days following its commencement. Upon written approval by the applicant, said time limitation may be extended by the Commission one or more times, provided the total period of any such extension or extensions shall not exceed 65 days in total. All final subdivision applications require the property to be posted to notice of such meeting. The requirements of such notification are explained in Section 4.20 General Requirements.

_____ xix) It is the burden of the applicant to submit a complete application, and to demonstrate compliance with all criteria and requirement of these Regulations and, accordingly, the applicant may submit such additional reports or information as may be required to satisfy that burden. Any application found to be incomplete may be denied by the Commission without prejudice to a future complete application.

_____ xx) The filing of an application with the Commission shall be deemed to constitute permission by the applicant for the Commission or its agents to enter onto the subject property for the purpose of inspections and tests; and, if the Commission designates a formal site walk, such permission shall allow the general public, in company with the Commission only, to inspect such property.

_____ b) <u>Technical Approvals or Reports.</u>

Please list

3.05 PLAN FOR RECORD SUBDIVISION - MAP CRITERIA

a. **The record subdivision map shall be prepared with an accuracy meeting the standards for a "Class A-2 Transit Survey". The map(s) shall be a clear and legible print at a scale of one inch equals forty feet (1"=40') feet on sheets twenty-four by thirty-six inches (24"x36"). When more than one (1) sheet is required an index sheet of the same size sheet showing the entire subdivision shall be submitted with the Plan. The Plan, which may composed of multiple sheets or sets of sheets, shall show the following information:**

_____ i). Name and address of the owner of the land to be subdivided; name and address of the applicant if different from the owner;

_____ ii). The title of the subdivision, which shall not duplicate the title of any previous subdivision in the Town of East Haddam.

_____ iii). Date of Map

_____ iv). Graphic and word scale

_____ v). North arrow with reference to true, grid, magnetic north or relationship to other map shall be noted. (If magnetic north, the date of the magnetic reading shall be noted.)

_____ vi). Zones and Districts which subdivision lies in, total acreage, number of lots.

_____ vii). Name, license number, and embossed seal or official stamp of State of Connecticut Land Surveyor and/or Registered Civil Engineer Name, license number, signature box for Soil Scientist if any.

_____viii). The plan shall contain the following statement: "The Subdivision Regulations of the East Haddam Planning and Zoning Commission are a part of this plan, and approval of this plan is contingent on completion of all the requirements of said Subdivision Regulations."

_____ ix) A signature Box containing the following words:

Approved by the East Haddam Planning and Zoning Commission
Date:_____ Chairman/Secretary _____
Expiration Date: _____

b. Subdivision Plan: at 1" = 40' scale on sheets 24" x 36"

_____ i). Existing and proposed property and street lines - Proposed street names. Proposed road(s), names which shall not duplicate or be readily confused with already existing names unless an extension thereof.

_____ ii). Adjoining property lines for a distance of 200'; and the names of all adjacent subdivisions and/or property owners. Assessor's Map and Lot numbers included. Location and dimensions of all existing property lines of the subdivision with reference to monuments, pipes, drill holes, foundations or other points of reference of a fixed or semi-permanent nature, utility poles and numbers.

_____ iii). Existing and proposed easements and right-of-way either on or of off site, including those for utilities, sewers, and drainage.

_____ iv). Layout of lots and lot numbers, dimensions of all lot lines, acres and square footage of all lots, building set back lines, location of any monuments or markers to be placed at corners or angles of all lots. Dimensions on all lines shall be to the hundredth of a foot with bearings or deflection angles on all straight lines and the central angle, tangent distance, and radius of all arcs.

____ v). A-2 certification and Licensed Surveyor Seal, with ties to a known coordinate system.

_____ vi). A general location map showing the location of the subdivision area in relation to existing roads in the Town at a scale not less than 1" = 1000’.

____ vii). All permanent features, such as existing structures, stone walls, fences, watercourses, ponds, swampland, wooded areas, specimen trees of greater than 12" measured at DBH (especially along existing streets), exposed ledge, areas designated for conservation, proposed buffer areas, and land to be set aside for playground, park or open space use.

_____ viii). Topography is to be Class T-2 standards and not interpolated from CGS quadrangle maps. Contours (existing and proposed) are to be at two feet intervals for lots to be subdivided and shall cover the entire lot unless a waiver is requested and granted.

_____ ix). Layout of lots and lot numbers. The proposed lot number and assigned street number shall be the same when creating new streets. All lots shall have street numbers assigned in accordance with the following system: Heading north -odd numbers are assigned to the west, while the east side shall have the even numbers; heading south - odd numbers are assigned to the west, while the east side shall have the even numbers; heading east - odd numbers are assigned to the south, while the north side shall have the even numbers; heading west - odd numbers are assigned to the south, while the north side shall have the even numbers.

_____ x). Soil type or types to include FEMA 100 year Flood Zones, wetlands and streambelt areas as taken from field data and the detailed soil map of East Haddam by Middlesex County Soil and Water Conservation district;

_____ xi). Soil types and inland wetlands and watercourses, as defined in the Inland Wetlands and Watercourses Regulations, delineated by a certified soils scientist; Flood Zones, in accordance with the most current Federal Flood Insurance Rate Map; and regulated areas as defined by in the Inland Wetlands and Watercourses Regulations

_____ xii). Areas with 20% or more slope delineated.

_____ xiii). Proposed driveway grades over 8% labeled or noted.

_____ xiv). Proposed land uses, including location of buildings, buffer strips, fences, signs, etc.

_____xv). Proposed limits of clearing and grading, stock pile sites.

_____ xvi). Storm water drainage and dry wells location, if any.

_____ xvii). Proposed on site sanitary arrangements. This must include a report on soil conditions, based on drainage, deep test holes, and seepage testing made in accordance with the recommendations of the State Public Health Code as amended. The criteria for septic system design and reports is further explained in Section 4.04.

_____ xviii). Certification by Town Sanitarian per Section 4.04 of the Subdivision Regulations including test pit data and signature box as described in Section 4.04

_____ xix). Any additional data necessary, together with the aforesaid said data, to enable a licensed surveyor to determine the location of every street line, lot line, boundary line, and to reproduce such lines upon the ground to the A-2 Standard of Accuracy.

_____ xx). Certificate under seal of (I) a Connecticut licensed professional engineer as to the adequacy of proposed Public Improvements, suitability of water supply, and waste disposal, and (ii) a Connecticut licensed land surveyor that both the survey and the map conform to the standards of survey and map accuracy respectively of Class A-2 as defined in the "Recommended Standards for Surveys and Maps in the State of Connecticut" as adopted by the Connecticut Association of Land Surveyors, Inc. on September 24, 1992, or as the same may be amended from time to time; or any successor agency authorized to define standards of accuracy in surveys.

_____ xxi). The location of any signs to be used for identification or sale of lots, in accordance with Section 12 Sign Regulations of the East Haddam Zoning Regulations.

_____ xxii). Where the subdivisions are proposed to be developed in phases, such phases shall be clearly delineated on the Final Subdivision Plan.

_____ xxiii). The Minimum Building Land Area as described in Section 4.06 shall be delineated on each lot. The plans shall include all soil investigation results.

c. **Construction Plan and Profiles _**

When new roads or improvements of existing roads are involved in a subdivision, the Final Subdivision Plan shall be accompanied by complete Plan-Profiles of each such road drawn on a sheet, which shall be twenty-four by thirty-six inches (24" x 36") in size. The horizontal scale shall be a horizontal scale of one inch equals forty feet (1" = 40') and the vertical scale shall be one inch equals four feet (1" = 4'). The plan shall conform to Section 5 of the Subdivision Regulations. Such Plan-Profiles shall show:

_____ i) Layout of street with centerline horizontal geometry in stations coordinated with the profile.

_____ ii) Paved roadways, proposed signs, street trees, landscaped areas, guide rails, pavement striping, curbs, swales, sidewalks, bikepaths, street lighting, partial driveways, easements, partial lot lines, lot numbers, utilities with all invert and top of frame elevations.

_____ iii) Lengths, slopes and types of pipe materials.

_____ iv) Typical cross section of roadway.

_____ v) Profile of roadway showing existing and finished grades, all tangent grades, and all vertical curve information.

_____ vi) All catch basins and man holes and connecting pipes.

_____ vii) By proper notation, location and elevations of bench marks, based on U.S.C.&G.S. datum. Provide at least one bench mark per plan profile sheet.

_____ viii) Grades expressed as percentages.

_____ ix) Data showing disposition of surface water, including, but not limited to, catch basins, plunge pools, swales, retention/detention basins, porous pavement, and the like; water and sanitary sewer pipes (if any), including sufficient data to permit checking of drainage designs; and the location of all associated easements or rights of way in favor of the Town or any public utility.

_____ x) Typical cross-section of each road indicating location, dimensions and materials of proposed paved improvements and utilities.

_____ xi) Location of street name, speed limit, stop, dead end, and other street signs..

_____ xii) Certificate under seal of a Connecticut licensed professional engineer as to the adequacy of proposed public Improvements and that the Plan-Profiles are substantially correct.

_____ xiii) Drainage system shall conform to Section 4.02.

SECTION 4.0 GENERAL REQUIREMENTS

4.01 SOIL EROSION AND SEDIMENT CONTROL PLAN FOR LAND DEVELOPMENT

A soil erosion and sediment control plan consistent with the publication of the Connecticut Council on Soil and Water Conservation in Cooperation with the Connecticut Department of Environmental Protection entitled, 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as the same may be amended from time to time, shall be submitted with all subdivision applications when the disturbed area of development is more than one-half (½) acre.

The Soil Erosion and Sediment Control Plan (E&S Plan) is an integral part of the Subdivision Plan. For the purposes of review, certification, bonding and enforcement, the E&S Plan narrative and drawings should be developed so they can be separated from the overall site plan, as needed to facilitate their use. On small, non complex subdivisions of four lots or less, the E&S plan need not be separate if clarity of information is maintained.

The Commission, or its duly authorized representative, shall review these plans as submitted and shall take necessary steps to insure compliance by the developer with these plans as finally approved.

b) E&S Plan Checklist All Plans shall contain the information requested in the E&S checklist provided in the 2002 Guidelines for Soil Erosion and Sediment Control found in Chapter 3 and list underneath.

1. Narrative

____ 1.1 Purpose and description of project.
____ 1.2 Estimates of the total area of the project site and the total area of the site that is expected to be disturbed by construction activities.
____ 1.3 Identification of site-specific erosion or sediment control concerns and issues.
____ 1.4 The phases of development if more than one phase is planned.
____ 1.5 The planned start and completion dates for each phase of the project.
____ 1.6 Either provide or identify where in the E&S plan the following information is found:
____ 1.6.1 the design criteria, construction details and maintenance program for the erosion and sediment control measures to be used.
____ 1.6.2 the sequence of major operations within each phase, such as installation of erosion control measures, clearing, grubbing, excavation, grading, drainage and utility installation, temporary stabilization, removal of temporary erosion control measures
____1.6.3 the time (in days) required for the major operations identified in the sequence
____ 1.7 Identify other possible local, state and federal permits required.
____ 1.8 Identify the conservation practices to be used.
____ 1.9 A listing of all other documents to be considered part of the E&S plan (e.g. reports of hydraulic and hydrologic computations, boring logs, test pit logs, soil reports, etc.)

2. Support Documents (as may be needed to support Engineering Designs)

____ 2.1 Hydraulic calculations

____ 2.1.1 Size and locations of existing and planned channels or waterways with design calculations and construction details.

____ 2.1.2 Existing peak flows with calculations

____ 2.1.3 Planned peak flows with calculations

____ 2.1.4 Changes in peak flows

____ 2.1.5 Off-site effects of increased peak flows or volumes

____ 2.1.6 Design calculations and construction details for engineered measures used to control off-site erosion caused by the project

____ 2.1.7 Design calculations and construction details for engineered measures used to control erosion below culverts and storm sewer outlets

____ 2.1.8 Design calculation and construction details for engineered measures used to control groundwater, i.e. seeps, high water table, etc.

____ 2.2 Boring logs, test pit logs, soils reports, etc.

____ 3.0 Site Drawing(s) Checklist

____ 3.1 Jurisdictional Features Required on All Maps or Drawings

____ 3.1.1 North arrow

____ 3.1.2 Scale (including graphical scale)

____ 3.1.3 A title block containing the name of the project, the author of the map or drawing, the owner of record for the project, date of drawing creation and any revision dates

____ 3.1.4 Property lines

____ 3.1.5 Legend identifying the symbols used

____ 3.1.6 For plans containing E&S measures which require an engineered design, the signature and seal of a professional engineer licensed to practice in Connecticut

____ 3.2 Site Locus Map

____ 3.2.1 Scale (1"= 1000’ recommended)

____ 3.2.2 Project location (show property boundaries and at least the area that is within 1000 feet of the property boundaries)

____ 3.2.3 Roads, streets/buildings

____ 3.3.4 Major drainage ways (at least named watercourses)

____ 3.3.5 Identification of any public drinking water supply watershed area

____ 3.3 Topography, Natural Features and Regulatory Boundaries

____ 3.3.1 Existing contours (2 foot intervals)

____ 3.3.2 Planned grades and elevations

____ 3.3.4 Limits of cuts and/or fills

____ 3.3.5 Soils, bedrock

____ 3.3.6 Seeps, springs

____ 3.3.7 Inland wetlands boundaries

____ 3.3.8 FEMA identified floodplains, floodways and State established stream channel encroachment lines
____ 3.3.9 Streams, lakes, ponds, drainage ways, dams
____ 3.3.10 Existing vegetation
____ 3.3.11 Tidal wetland boundaries and coastal resource limits (e.g. mean high water, shellfish beds, submerged aquatic vegetation)
____ 3.3.12 Public water supply watershed, well heads or aquifer boundaries (when available)

____ 3.4 Drainage Patterns
____ 3.4.1 Existing and planned drainage patterns (including off-site areas)
____ 3.4.2 Size of drainage areas
____ 3.4.3 Size and location of culverts and storm sewers (existing and planned)
____ 3.4.4 Size and location of existing and planned channels or waterways
____ 3.4.5 Major land uses of surrounding areas

____ 3.5 Road and Utility Systems
____ 3.5.1 Planned and existing roads and buildings with their location and elevations
____ 3.5.2 Access roads: temporary and permanent
____ 3.5.3 Location of existing and planned septic systems
____ 3.5.4 Location and size of existing and planned sanitary sewers
____ 3.5.5 Location of other existing and planned utilities, telephone, electric, gas, drinking water wells, etc.

____ 3.6 Clearing, Grading, Vegetation Stabilization
____ 3.6.1 Areas to be cleared, and sequence of clearing
____ 3.6.2 Disposal of cleared material (off-site and on-site)
____ 3.6.3 Areas to be excavated or graded, and sequence of grading or excavation
____ 3.6.4 Areas and acreage to be stabilized with vegetation (Temporary and/or permanent)
____ 3.6.5 Planned vegetation with details of plants, seed, mulch, fertilizer, planting dates, etc.

____ 4. Erosion & Sediment Control Drawings

____ 4.1 Location of E&S measure on site plan drawing with appropriate symbols

____ 4.2 Construction drawings and specifications for measures

____ 4.3 Maintenance requirements of measures during construction of project

____ 4.4 Person [name and 24-hour telephone number] responsible for maintenance during construction of project and statement that such information shall be updated within 24 hours of any change and designation.

____ 4.5 Maintenance requirements of permanent measures after project completion

____ 4.6 Handling of emergency situations (e.g. severe flooding, rains or other environmental problems).

____ 4.7 If not provided in the narrative, the information listed in checklist paragraph 1.6 (see narrative heading)

____ c. The estimated costs of measures required to control soil erosion and sedimentation, as specified in the certified plan shall be submitted as part of the application. Measures to be taken to control erosion and sedimentation shall be described and provided for in the construction agreement and the estimated cost of accomplishing such measures shall be covered in a Bond or other assurances acceptable to the Commission.

4.02 STORMWATER MANAGEMENT

4.02.4 Stormwater Management Plan Requirements

The stormwater management plan shall include:

a. Calculations: Hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in the DEP Stormwater Design Manual (i.e., 2, 10, 25 & 100-yr storm). Such calculations shall include, at a minimum:

____ i. Description of the design storm frequency, intensity and duration,
____ ii. Time of concentration and travel time.
____ iii. Soil Curve Numbers or runoff coefficients.
____ iv. Peak runoff rates and total runoff volumes for each watershed area.
____ v. Infiltration rates, where applicable, as determined by field testing of hydraulic conductivity.
____ vi. Culvert capacities.
____ vii. Flow velocities.
____ viii. Data on the increase in rate and volume of runoff for the design storms referenced in the DEP Stormwater Design Manual.
____ ix. Water surface elevations showing methodologies used and supporting calculations.
____ x. Stage-discharge curves, outlet rating curves and inflow and outflow hydrographs for storage facilities (e.g., stormwater ponds and wetlands).
____ xi. Hydrologic and hydraulic analysis for all structural components of stormwater system (e.g., storm drains, open channels, swales, management practices, etc.) for applicable design storms including final analysis of potential downstream effects of project, where necessary.
____ xii. Documentation of sources for all computation methods and field test results.

____ b. Soils Information: If a stormwater management control measure depends on the hydrologic properties of soils (e.g., infiltration basins), then a soils report must be submitted. The soils report must be based upon on-site boring logs or soil pit profiles. The number and location of required soil borings or soil sites must be determined based on what is needed to determine the suitability and distribution of soil types present at the location of the control measure. If infiltration is to be part of the stormwater management plan, then field testing of hydraulic conductivity is required.

____ c. Maintenance and Repair Plan: The design and planning of all stormwater management facilities shall include detailed maintenance and repair procedures to ensure their continued function. These plans will identify the parts or components of a stormwater management facility that need to be maintained and the equipment and skills or training necessary.

____ d. Landscaping plan: The applicant must present a detailed plan for planting of vegetation at the site after construction is finished.

____ e. Maps and plans: The applicant must depict the stormwater management on the supplemental plans (scale of 1" = 40' or greater detail). Such plans must illustrate, in addition to the mapping requirements cited in Section 3, at a minimum:

___ i. Perennial and intermittent streams.
___ ii. Location and boundaries of resource protection areas such as wetlands, lakes, ponds, and other setbacks (e.g., stream buffers, drinking water well setbacks, septic setbacks)
___ iii. Location of existing and proposed conveyance systems such as grass channels, swales, and storm drains.
___ iv. Flow paths.
___ v. Location of floodplain and floodway limits.
___ vi. Location and dimensions of proposed channel modifications, such as bridge or culvert crossings.
___ vii. Location, size, maintenance access, and limits of disturbance of proposed structural stormwater management practices.
___ viii. Representative cross-section and profile drawings and details of structural stormwater management practices and conveyances (i.e., storm drains, open channels, swales, etc.) which include existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.) and design water surface elevations.
___ ix. Structural details of outlet structures, embankments, spillways, stilling basins, grade control structures, conveyance channels, etc.

4.04 CERTIFICATION BY TOWN SANITARIAN

Test pits and percolation tests shall be performed in accordance with Section 19-13-B103e(d) Site Investigation, of the Connecticut Public Health Code (as amended), and inspected by the Town Sanitarian. The location of test pits and percolation tests shall be in accordance with Section 19-13-B103e(e) (as amended).

All test pit data shall be shown on all subdivision/resubdivision maps and filed and recorded. The data shall be certified by the Town Sanitarian.

A signature box shall contain the following words:

CERTIFICATION BY THE TOWN SANITARIAN.

I HERE-BY CERTIFY THAT ALL LOTS ON THIS MAP MAY HAVE SEPTIC SYSTEMS

AND WELLS AT LOCATIONS SHOWN. THE FOLLOWING LOTS, IF ANY, SHALL HAVE

ENGINEERED DESIGNED SYSTEMS_____.

DISTRICT SANITARIAN _____. DATE _____.

____ 4.06 MINIMUM BUILDABLE LAND REQUIREMENTS
Scope of Requirement

No proposed plan of a new Subdivision in any district except the R1/2, C/B/IG, and C3 districts shall hereafter be approved unless the proposed lots equal or exceed the minimum size, width, and criteria requirements set forth in the various districts of these Regulations except as may otherwise be specifically provided in a Conservation Subdivision. Each proposed lot shall include an area of minimum buildable land which complies with all of the criteria as defined in the section below. Lots constructed in the past that have not met these requirements have demonstrated undesirable effects such as unnecessary and excessive blasting, flooded basements, ground water management problems, stormwater management issues, questionable long term septic viability, ground water contamination, and erosion control problems. Additional testing in the field may be required as directed by the Town of East Haddam representative to verify compliance with the Minimum Buildable Land Area.

Minimum Criteria of Buildable Land Each lot shall meet the following criteria:

(a) In the R2 and R4 Districts an area of at least 3/4 acre (32,670 square feet) shall be delineated, having at least four sides with the shortest side being no less than 130 linear feet. The shape of such an area shall generally resemble a rectangle, pentagon or other like geometric figure.
In the R & R1 District an area of at least 2/3 acre (28,750 square feet) shall be delineated, having at least four sides with the shortest side being no less than 115 linear feet. The shape of such an area shall generally resemble a rectangle, pentagon or other like geometric figure.
(Hereinafter the "MBL Area")

(b) Within the MBL Area, naturally occurring topography not exceeding twenty percent (20%) slope in grade, as measured in 40 foot increments throughout the MBL Area. Topography exceeding 20% slope shall only be permitted to comprise 20% of the MBL Area. Areas exceeding twenty percent (20%) slope shall be shaded on the proposed plans.

(c) Lots where testing indicates that there is less than twenty four inches (24") of naturally occurring soil to ground water shall not to be included in the MBL Area.

(d) Ledge rock no higher than four (4) feet below the natural ground surface as observed during soil testing shall not be included in the MBL Area..

(e) No Inland or Tidal Wetlands or Watercourses, determined by a professional soils scientist, who is certified by the Society of Soils Scientists of Southern New England or Regulated Areas as defined by the East Haddam Inland Wetlands and Watercourses Commission, shall be contained in the MBL Area.

(f) No MBL Area shall contain areas of vehicular travel easements, right of ways, utilities, drainage easement areas, restrictive cutting easements or conservation easements used a in lieu of Stormwater Management, and other easements for public or private facilities.

_____ 4.07 INLAND WETLANDS AND WATERCOURSES COMMISSION

No application for Subdivision shall be deemed complete without the submission of a certified copy of the motion for approval or report as issued by the East Haddam Inland Wetlands and Watercourses Commission. Any plans submitted to the Planning and Zoning Commission shall conform, in all relevant respects, to those plans submitted to the Inland Wetlands and Watercourses Commission as the same were approved, or modified and approved, by said Commission.

_____ 4.08 PASSIVE SOLAR ENERGY TECHNIQUES

_____ 4.09 OPEN SPACES AND RECREATIONAL AREAS

_____ 4.10 STREAMBELT RESERVATIONS

The applicant shall delineate a streambelt along any watercourses passing through the property to be subdivided. The streambelt shall be established in accordance with the publication of the "Streambelt Map", dated April 1973, and on file at the Town Clerks Office and the Zoning Office.

_____ 4.11 GROUNDWATER MANAGEMENT PLAN

_____ 4.12 FIELD REVIEW BY COMMISSION

The Commission may request that all proposed roadway centerline, lot lines, house sites, septic areas, wetland borders and locations of all major drainage facilities be staked in the field by the developer's engineer or surveyor to permit the Commission to view the proposed locations. The centerline shall be staked every one hundred (100) feet and the stakes shall show the roadway station.

N/A 4.13 REQUIREMENT OF AFFORDABLE HOUSING Reserve

_____ 4.14 TREES, SOIL REMOVAL AND ROADS

____ 4.15 PEDESTRIAN WALKWAYS / BIKEWAYS

_____ 4.16 SITES OF HISTORICAL, CULTURAL, AND ARCHEOLOGICAL SIGNIFICANCE

_____ 4.17 STONE WALLS AND FOUNDATIONS

_____ 4.18 RURAL, RESIDENTIAL, & AGRICULTURAL BUFFER AREAS

_____ 4.19 FIRE PROTECTION

_____ 4.20 **PUBLIC NOTICE**

a) Notice to Adjoining Owner The applicant shall notify all owner(s) of parcel(s) (as recorded on the last completed Grand List of the Town of East Haddam) within a distance of one hundred (100) feet from any boundary of said parcel(s) effected. Notification shall be in writing, certified mail return receipts requested, not less than fourteen (14) days prior to said hearing. No notice shall be required for the continuation of a public hearing once it has been open.

b) Posting of Sign No less than ten (10) days prior to the opening of any public hearing, the applicant shall post a sign on the property which is the subject of any application for subdivision. The face of the sign shall be provided with the following information in the following format;

NOTICE OF PUBLIC HEARING

SUBDIVISION APPLICATION

DATE OF HEARING

TIME

LOCATION

EAST HADDAM PLANNING & ZONING COMMISSION APP. #

It shall be the obligation of the Applicant to post such sign on the property in a location which is plainly visible from the nearest public street (or streets where applicable), and to maintain the sign until the opening of the public hearing. The sign shall be four (4) feet by four (4) feet in size. Lettering shall be clearly visible from the street. No sign need be posted for the continuation of a public hearing once it has opened. Signs are to be removed within seven days after the closing of the public hearing.

SECTION 7 - WAIVER

The Commission recognizes that each parcel of property is unique in location, dimensions, orientation, topography, etc., and the various factors in the design of subdivisions are variable with relation to each other and to the above characteristics of the property. Therefore, in accordance with Connecticut General Statutes Section 8-26, the Commission may modify or waive, subject to appropriate conditions, such requirements as is in its judgment of the special circumstances and conditions, that are not requisite to the interest of public health, safety and general welfare. Please review Section 7 Waiver of the Subdivision regulations.

Any request for waiver under this Section shall be stated on the Subdivision Application form, and, if granted, shall be noted on the Subdivision Plans with a reference to the lot(s) affected, and the Section of these Regulations modified or waived, and the extent or nature thereof. In granting or denying any request for waiver, the Commission shall state upon the record the reasons for such action.

Development Application Checklists

Town of Hebron

Town of Hebron, Connecticut

Town Office Building
15 Gilead Street; Hebron, Connecticut 06248
Phone: (860) 228-5971 Fax: (860) 228-5980

SITE PLAN APPLICATION PROCESS

Applicant,

It is highly recommended that prior to submitting any application, the applicant contact the Town Planner for a preliminary review. After the initial discussion with the Town Planner, a recommendation will be made whether to submit the plans for an informal staff review, and / or an informal review by the Planning and Zoning Commission (Commission). This preliminary step in the application process helps to familiarize applicants with specific land-use regulations and policies of the Town as well as provides the town with an overview of materials that will be submitted with the application. It can also identify other land use approvals that are likely to be needed. This process greatly reduces the amount of time required in the formal application process.

After the completion of this preliminary process, or if such a process is not needed for this specific application, a formal application to the Commission should proceed. Once a completed formal application has been submitted, all materials will be distributed to the Commission and to Town staff - Town Engineer, Fire Marshal, Town Sanitarian, Wetland Agent, WPCA Administrator, Director of Public Works and Town Planner, as applicable. Incomplete application submissions will only delay the processing and review of your application. Town staff will review the application materials and submit reports to you and the Commission. It is recommended that plans be amended to address staff review comments prior to presentation of the application to the Commission.

The Town will schedule the application for a presentation and action on an upcoming Planning and Zoning Commission agenda. The Commission has sixty-five days to act on the application from the day-of-receipt (the day of the next regularly scheduled Commission meeting following receipt of a complete application).

If you have any questions regarding this process, please contact the Town Planner at 860-228-5971, X137.

Sincerely,

Hebron Planning Department

Town of Hebron, Connecticut

Town Office Building
15 Gilead Street; Hebron, Connecticut 06248
Phone: (860) 228-5971 Fax: (860) 228-5980

SITE PLAN APPLICATION CHECKLIST

Applications are considered complete only when all of the information as required by the Hebron Zoning Regulations is received. Please use the following checklist as an aid to verify your application packet contains all of the required information, as incomplete applications will not be reviewed.

Office	Applicant	
		Application form with all information provided and with original signature
		Proof of legal interest in the subject property
		Application fee - Check made payable to the "Town of Hebron"
		Copy of Assessor's Card for subject property
		Verification from Tax Collector that taxes are current
		Fourteen (14) copies of an accurate site plan including the following information:
		Date, Scale, Approximate north arrow and true north arrow
		The boundary line of the tract with accurate linear and angular dimensions
		Existing/ proposed contours, vertical interval of two feet, referred to see level datum
		Existing property lines, streets, buildings, watercourses, bridges, utility lines, culverts, drainpipes, and utility easements on and within 20 ft. of proposed development
		Names, locations and dimensions of proposed streets, buildings, parking areas, traffic access and circulation walkways, recreation areas, fencing, landscaping, and utility layouts
		Designated regulated areas including Inland Wetlands and 100 yr. Flood Hazard Zone
		Existing and Proposed buildings and uses
		Dimensions of all yards with all zoning setbacks shown
		Water supply, buried fuel tanks, and sewage disposal facilities
		Proposed landscaping including the type, size, caliper, and location of proposed planting.
		Erosion and sedimentation control plan as per Section 8.1.5 of the Regulations
		Location, type, and illustration with indication of color and size of any proposed signs
		Street address
		Proposed Land Use
		Parking calculation and the use category upon which it is based
		Zone boundary
		Percent coverage calculation
		Test data for septic system
		Location and type of fences (if any)
		Date of approval of any other boards (Wetlands, ZBA)
		Typical cross section of parking surface/ access driveways
		Provisions for solid waste disposal and its screening
		Proposed outdoor illumination, including method and intensity
		Architectural and Design Review information as per Section 8.16.D of the Regulations
		A Stormwater Management Plan as per Section 8.25 of the Regulations

Town of Hebron, Connecticut

Town Office Building
15 Gilead Street; Hebron, Connecticut 06248
Phone: (860) 228-5971 Fax: (860) 228-5980

SPECIAL PERMIT APPLICATION PROCESS

Applicant,

It is highly recommended that prior to submitting any application, the applicant contact the Town Planner for a preliminary review. After the initial discussion with the Town Planner, a recommendation will be made to submit the plans for an informal staff review, and / or an informal review by the Planning and Zoning Commission (Commission). This preliminary step in the application process helps to familiarize applicants with specific land-use regulations and policies of the Town as well as provides the town with an overview of materials that will be submitted with the application. It can also identify other land use approvals that are likely to be needed. This process greatly reduces the amount of time required in the formal application process.

After the completion of this preliminary process, or if such a process is not needed for this specific application, a formal application to the Commission should proceed. Once a completed formal application has been submitted, all materials will be distributed to the Commission and to Town staff - Town Engineer, Fire Marshal, Town Sanitarian, Wetland Agent, WPCA Administrator, Director of Public Works and Town Planner, as applicable. Incomplete application submissions will only delay the processing and review of your application. Town staff will review the application materials and submit reports to you and the Commission. It is recommended that plans be amended to address staff review comments prior to presentation of the application to the Commission.

The Town will schedule the application for a public hearing on an upcoming Planning and Zoning Commission agenda. The Commission has sixty-five days to schedule such hearing from the day-of-receipt (the day of the next regularly scheduled Commission meeting following receipt of a complete application). Once the hearing is scheduled you will receive a copy of the legal notice for the hearing. You must mail a copy of this notice to all property owners within 100 feet of the property following all of the requirements contained in Section 8.1.4 of the Hebron Zoning Regulations.

If you have any questions regarding this process, please contact the Town Planner at 860-228-5971, X137.

Sincerely,
Hebron Planning Department

Town of Hebron, Connecticut

Town Office Building
15 Gilead Street; Hebron, Connecticut 06248
Phone: (860) 228-5971 Fax: (860) 228-5980

SPECIAL PERMIT APPLICATION CHECKLIST

Applications are considered complete only when all of the information as required by the Hebron Zoning Regulations is received. Please use the following checklist as an aid to verify your application packet contains all of the required information, as incomplete applications will not be reviewed.

Office	Applicant	
		Application form with all information provided and with original signature
		Proof of legal interest in the subject property
		Application fee - Check made payable to the "Town of Hebron"
		Copy of the Assessor's Card for subject property
		Verification from Tax Collector that taxes are current
		Abutters' List and Map from Assessor's Office (100' from subject property)
		Fourteen (14) copies of an accurate site plan including the following information:
		Date, Scale, Approximate north arrow and true north arrow
		The boundary line of the tract with accurate linear and angular dimensions
		Existing/proposed contours, vertical interval of two feet, referred to see level datum
		Existing property lines, streets, buildings, watercourses, bridges, utility lines, culverts, drainpipes, and utility easements on and within 20 ft. of proposed development
		Names, locations and dimensions of proposed streets, buildings, parking areas, traffic access and circulation walkways, recreation areas, fencing, landscaping, and utility layouts
		Designated regulated areas including Inland Wetlands and 100 year Flood Hazard Zone
		Existing and Proposed buildings and uses
		Dimensions of all yards with all zoning setbacks shown
		Water supply, buried fuel tanks, and sewage disposal facilities
		Proposed landscaping including the type, size, caliper, and location of proposed planting.
		Erosion and sedimentation control plan as per Section 8.1.5 of the Regulations
		Location, type, illustration, color and size of any proposed signs
		Street address
		Proposed Land Use
		Parking calculation and the use category upon which it is based
		Zone boundary
		Percent coverage calculation
		Test data for septic system
		Location and type of fences (if any)
		Date of approval of any other boards (Wetlands, ZBA)
		Typical cross section of parking surface/ access driveways
		Provisions for solid waste disposal and its screening
		Proposed outdoor illumination, including method and intensity
		Architectural / Design Review information as per Section 8.16.D of the Regulations
		A Stormwater Management Plan as per Section 8.25 of the Regulations

Town of Hebron, Connecticut

Town Office Building
15 Gilead Street; Hebron, Connecticut 06248
Phone: (860) 228-5971 Fax: (860) 228-5980

SUBDIVISION APPLICATION PROCESS

Applicant,

It is highly recommended that prior to submitting any application, the applicant contact the Town Planner for a preliminary review. After the initial discussion with the Town Planner, a determination will be made to submit the plans for an informal staff review, and / or an informal review by the Planning and Zoning Commission (Commission). This preliminary step in the application process helps to familiarize applicants with specific land-use regulations and policies of the Town as well as provides the town with an overview of materials that will be submitted with the application. It can also identify other land use approvals that are likely to be needed. This process greatly reduces the amount of time required in the formal application process.

After the completion of this preliminary process, or if such a process is not needed for this specific application, a formal application to the Commission should proceed. Once a completed formal application has been submitted, all materials will be distributed to the Commission and to Town staff - Town Engineer, Fire Marshal, Town Sanitarian, Wetland Agent, WPCA Administrator, Director of Public Works and Town Planner, as applicable. Incomplete application submissions will only delay the processing and review of your application. Town staff will review the application materials and submit reports to you and the Commission. It is recommended that plans be amended to address staff review comments prior to presentation of the application to the Commission.

The Town will schedule the application for a public hearing on an upcoming Planning and Zoning Commission agenda. The Commission has sixty-five days to schedule such hearing from the day-of-receipt (the day of the next regularly scheduled Commission meeting following receipt of a complete application). Once the hearing is scheduled you will receive a copy of the legal notice for the hearing. You must mail a copy of this notice to all property owners within 100 feet of the property following all of the requirements contained in Section 4.6 of the Hebron Subdivision Regulations.

If you have any questions regarding this process, please contact the Town Planner at 860-228-5971, X137.

Sincerely,
Hebron Planning Department

Town of Hebron, Connecticut

Town Office Building
15 Gilead Street; Hebron, Connecticut, 06248
Phone: (860) 228-5971 Fax: (860) 228-5980

SUBDIVISION APPLICATION MATERIAL SPECIFICATIONS

A. Record Subdivision Map

1. Location and dimensions of all existing property lines of the subdivision with reference to monuments, pipes, drill holes, foundations, structures or other points of reference of a fixed or semi-permanent nature; Assessor's map, block and parcel numbers; utility poles and numbers
2. Names and addresses of present record owners of abutting properties as indicated in the current records of the Town Assessor and names and approval dates of abutting subdivisions
3. Lines of proposed and existing roads and trails, lots, easements, rights-of-way, and areas to be dedicated to public use; lengths and bearings of all straight lines, adequate data for all curves
4. Area of all proposed lots in square feet and acres, with all zoning setback lines shown and area encumbered by conservation easement for each lot. Each lot shall be numbered and its dimensions on all sides given. If a side is a curved line, a single dimension shall, nevertheless, be given in addition to any subordinate dimensions
5. Proposed road names which shall not duplicate or be readily confused with already existing names unless an extension thereof
6. Any additional data necessary, together with the aforesaid data, to enable a licensed surveyor to determine readily the location of every street line, lot line, and boundary line, and to reproduce such lines upon the ground to the A-2 Standard or equivalent of accuracy
7. All lots shall have street numbers as assigned by the Town Assessor
8. Certification by seal of a Connecticut-licensed land surveyor that the Record Subdivision Map has been prepared pursuant to the Regulations of Connecticut State Agencies Sections 20-300b-1 through 20-300b-20 and the "Minimum Standards for surveys and Maps in the State of Connecticut" as adopted by the Connecticut Association of Land Surveyors, Inc.
9. A reference map to the scale of one inch equals one thousand feet (1" = 1000') on each sheet showing the proposed subdivision and tie-in to the nearest street intersection and the sheet's relationship to the overall project. If the application submitted covers only a part of the applicant's holdings, the Commission may require a map which may appear on the same sheet, drawn on a scale in which one inch equals two hundred feet (1" = 200') showing an outline of the plotted area with its proposed road system and an indication of proposed future road systems and lot layout for the remaining portion of the tract
10. Where the subdivisions are proposed to be developed in phases, such phases shall be clearly delineated on the Record Subdivision Map
11. Total acreage of the entire tract being subdivided. The total acreage of all open space. The total acreage of sheet rights-of way. The total acreage of conservation easements.
12. Total number of lots proposed for the entire section and the number of lots in each section
13. Zoning district of entire tract and zoning districts in the total tract is in more than one zoning district

B. Site Development Plan

1. Existing and proposed contours at two foot intervals extending 50 feet beyond site boundaries by an actual field survey or by means of aerial photogrammetry (Aerial Topography). No other sources will be acceptable
2. Field delineated boundaries of all wetlands, watercourses and waterbodies by a Certified Soils Scientist, including all regulated areas as set forth in the Town of Hebron Inland Wetlands and Watercourses Regulations. The Plan shall contain the acreage of each lot encumbered by wetlands and waterbodies. The Plan shall contain the certification and signature of the Certified Soil Scientist.
3. Soils Conservation Service Soils Map Overlay of the entire area to be subdivided
4. The location and boundary of any Special Flood Hazard Areas and Floodways and the Base Flood Elevation
5. Existing edge of tree line and proposed limits of clearing. Location of any individual free-standing mature (+6 inches caliper) trees
6. Rock outcroppings and existing stone walls shall be shown and preserved where practical
7. Existing and proposed lot lines, roadway rights-of way, width of rights-of-way, pavement edge, pavement width and stations along the street centerline at every fifty-foot intervals
8. Existing and proposed storm drains, drainage structures, water mains, sanitary sewers including any necessary easements
9. Proposed house or structure, subsurface sewage disposal area, reserve area, well location, well protection radii, yard drains and points of discharge of all yard drains, all subsurface drains, and driveway locations for each lot of the subdivision
10. Detailed study of soils and subsoils:
    a. Percolation – Location of all test holes and percolation tests, along with test results of soil

profile verified by the Town Sanitarian. A minimum of four test holes shall be shown within each minimum Buildable land area
   b. Depth to Water-Table and Mottling
   c. Water-table gradients (if required)
   d. Depth to ledge
11. Minimum Buildable Land Area as required by the Hebron Zoning Regulations

C. Road Plan and Profile

Plan & Profile drawing shall be prepared on a 24" x 36" sheet size with scales of 1" = 40' horizontal and 1" = 4' vertical, showing the following:

1. The location and dimensions of existing and proposed street rights-of-way, edges of pavements, curbs, sidewalks, piping, catch basins, manholes, endwalls, bridges, utilities and utility easements, drainage easements, open channels, monuments, contours, all data required for accurate layout of roadway centerlines and rights-of-way, including stationing, bearings, tangent lengths, arc lengths, radii and central angles of all curves; location of property lines intersecting the street right-of-way lines and the names of owners of such adjacent property; typical cross-sections of each street, showing proposed dimensions, materials of construction, and locations of drainage piping and other underground facilities; location and description of survey bench mark; and, street signs and traffic control signs.
2. Profiles of existing ground surface at the centerline and at each right-of-way line
3. Profile of the proposed centerline, showing proposed grades, vertical curve data and stations at grade changes, intersections, high points and low points
4. Profiles of all existing and proposed drainage facilities, bridges and other proposed improvements showing locations, sizes, grades and invert elevations

D. Erosion & Sedimentation Control Plan

1. The subdivision plan shall have a separate plan and narrative describing the proper measures to control erosion and reduce sedimentation as set forth in the "Connecticut Guidelines for Soil Erosion and Sediment Control" published by the CT Council of Soil and Water Conservation, as amended. Such erosion and Sedimentation Control Plan shall consist of:
   a. Location of areas to be stripped of vegetation and other exposed or unprotected areas
   b. A narrative including the nature, purpose and description of the project as well as a schedule of operations to include starting and completion dates for major development phases, such as land clearing and grading, street, sidewalk, and storm sewage installation, etc.
   c. Seeding, sodding, or revegetation plans and specification for all unprotected or unvegetated areas
   d. Locations, design, and supporting calculations of structural sediment control measures, such as waterways, grade stabilization structures, velocity of dissipation structures, sediment basins, etc.
   e. Timing of planned sediment control measures
   f. General information relating to the implementation and maintenance of the sediment control measures
2. Referral of Erosion and Sedimentation Control Plan – The commission may refer these plans to the Tolland County Soil Conservation District or other agency or person for consulting technical assistance

E. Engineer's Report

A report prepared by a Connecticut-licensed Professional Engineer shall be submitted. The report shall contain a narrative describing existing conditions ant eh proposed development, with an enumeration of any and all zoning or design standard waivers requested. The report shall also contain engineering calculations, with full back-up materials, documenting the design of all Public Improvements shown on the plans. Where appropriate, the Engineer's Report shall be modified by amendment to address Town staff and Commission review, reports, comments and conditions of approval. All such comments shall be specifically addressed by either describing the plan revisions, or presenting justification for not modifying the plans. The following sections may be included as directed by Town Staff; other sections may be included as deemed appropriate by the Design Engineer or Town Staff.

1. Roadway Classification Determination
   a. Provide a scaled map which shows all proposed and existing streets in area of proposed development. Include each street's classification (i.e. arterial, collector, etc.) and pre-and post-development traffic volume (Average Daily Traffic or Design Hourly Volume as appropriate) for each street that may be impacted by development
   b. Submit detailed calculations to substantiate proposed classification: include all sources, assumptions, adjustment factors and data used.
2. Roadway Design Calculations
   a. Provide a list of design criteria for each proposed or impacted road. Include classification, design speed, width, length, critical slopes and any other pertinent criteria.
   b. Provide all vertical curve design information including slopes, lengths, "K" values and stopping sight distance. Identify any curve which does not meet minimum requirements
   c. Provide all horizontal curve information, including the minimum safe radius for the applicable design speed
   d. Prepare sightline drawings for critical intersections
   e. Identify where underdrains are required; provide all back-up data.
3. Hydrology Report – Pre- and Post-Development
   a. Provide a hydrology report with methodology, narrative and summary
   b. Include complete calculations, including all assumptions, soil types, curve numbers (or runoff coefficients) and detailed sample calculations

c. Provide hydrology plans; include pre-development and post-development conditions (two separate plans) They should include:
   i. All subdrainage areas clearly delineated on plans
   ii. Acreage of each subarea marked on plan
   iii. Indicate ground cover type and soil type on plans for each subarea
   iv. Any existing or proposed detention or retention structures.
   v. Pre-and post-development topography shown on respective plans
   vi. Clear delineation of flow paths used to establish *Time of Concentration* (Tc)
   vii. Clear indication of type of low, length of flow and calculated Tc for each flow path
   viii. Flow routing diagram, as required

4. Drainage Calculations
   a. Provide a drainage report including methodology, narrative and summary
   b. Provide a drainage schematic diagram on one sheet complete with pipe lengths, slopes, diameters, friction, coefficients and structures identification.
   c. Include complete detail calculations, including gutter flow analysis and pipe design, drainage structure design data and calculations, drainage structure details with all dimensions, a copy of any charts or nomographs used, and a listing of all assumptions made
   d. Provide complete calculations relative to detention and retention structures. Include, as a minimum, stage-storage-discharge curves, drain-down time, emergency spillway capacity and design detains for all critical elements such as outlet works and embankments.
   e. Provide complete design calculations of all outlet protection measures and energy dissipating devices.
   f. If an open drainage system is proposed, all information as set forth in Section 12, SubSection 13.7A2 [of the Subdivision Regulations] shall be provided
5. Earthwork Analysis
   An earthwork analysis shall be submitted for volumes of cut and fill required to construct the proposed road and associated public improvements.
6. Engineer's Opinion of Probably Construction Cost
   Separate itemized estimates shall be prepared for a) and b) below as required elsewhere in these regulations:
   a. All public improvements, including common driveways and all landscaping measures shown on the approved plans
   b. Sedimentation and erosion control measures
7. Miscellaneous
   The following miscellaneous information is also required:
   a. Minimum area of Buildable land calculations and worksheets
   b. Open space dedicated to calculations
   c. Any other information deemed necessary or requested, including but not limited to: traffic studies, sanitary sewer studies or reports, and design of sanitary sewer facilities, bridges and all other special structures

F. Supplemental Information

Whenever the staff or Commission shall deem it reasonably necessary or appropriate to request additional information for consideration of an application, it may require the applicant to submit, at or prior to the hearing, any other information in such form as it may prescribe. Furthermore, whenever the Commission shall deem required information unnecessary for the consideration of an application, applicant may request a waiver of such requirement

*** This information is also available in the Town of Hebron Subdivision Regulations and Public Improvement Specifications as amended on January 1, 2002.**

Town of Hebron, Connecticut

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15 Gilead Street; Hebron, Connecticut, 06248
Phone: (860) 228-5971 Fax: (860) 228-5980

SUBDIVISION APPLICATION CHECKLIST

Applications are considered complete only when all of the information as required by the Hebron Subdivision Regulations is received. Please use the following checklist as an aid to verify your application packet contains all of the required information, as incomplete applications will not be reviewed.

Office	Applicant	
		Application form with all information provided and with original signature
		Application fee – Check made payable to the "Town of Hebron"
		Proof of legal interest in subject property
		Copy of Assessor's Card for subject property
		Verification from Tax Collector that taxes are current
		Abutter's List and Map from Assessor's Office (100' from subject property)
		Fourteen (14) copies of all maps as follows:
		• **A 1" = 200' scale map showing proposed layout and properties within 1000' of perimeter**
		• **Record Subdivision Map (as per Section 5.5 A)**
		• **Site Development Plan (as per Section 5.5 B)**
		• **Road Plan and Profile (as per section 5.5 C)**
		• **Erosion & Sedimentation Control Plan (as per Section 5.5 D)**
		Engineer's Report (as per Section 5.5 E)
		Report of Conservation Commission concerning open space requirements
		Approval of Inland Wetlands Commission of regulated activity
		Letter of Approval from Sewer Authority or Health Department concerning sewage disposal and water supply
		Supplemental Information (as per Section 5.5 F)
		Letter of Acknowledgement or Interest from any Land Trust or similar organization showing a willingness to accept any proposed open space as applicable
		Architectural and Design Review information in accordance with Section 8.16.D of the Hebron Zoning Regulations
		A Stormwater Management Plan in Accordance with Section 8.25 of the Hebron Zoning Regulations

APPENDIX E

Development Review Fee Structures

Development Review Fee Structure

Town of Colchester

PLANNING and ZONING,
ENGINEERING, and
ZONING BOARD OF APPEALS
FEES

EFFECTIVE MAY 18, 2009

Colchester, CT Fee Structure

SERVICE		FEES
BASE ADMINSTRATIVE FEE		**$200.00**
+ PUBLIC HEARING FEE		**$200.00**
Planning & Zoning Review Fee		**$100.00**
Zone or Regulation Change		**$150.00**
Site Plan		**$100.00**
Subdivision		**$50./lot**
Multi-unit housing		**$50./unit**
ENGINEERING REVIEW FEES		
Site Plan (Class 2)		**$10/parking space**
Subdivision		**$100/lot with new or improved road**
		$80/lot on existing road
FOLLOW UP ENGINEERING REVIEW FEES		
2nd Review		**FREE**
Each Review after 2nd Review		**$500.00**
Driveway/Apron permits		
Driveway permits		**$50.00**
Apron Bonding		**$1,000.00**
ZONING BOARD OF APPEALS		
BASE ADMINSTRATIVE FEE		**$100.00**
+ PUBLIC HEARING FEE		**$200.00**
+ Zoning Review Fee		**$50.00**
ZONING PERMIT FEE		**$50.00**
STATE FEE pursuant to CGS 22a-27		**$30.00**

BUILDING PERMIT FEES
EFFECTIVE MAY 18, 2009

Colchester, CT Fee Structure		
SERVICE		**FEES**
NEW CONSTRUCTION		
$1,000 or less		**$20.00**
$1,000.01 to $60,000.		**$20/thousand or fraction thereof**
60,000. To $120,000.		**$20/thousand or fraction thereof**
Over $120,000.		**$20/thousand or fraction thereof**
Additional Required Permits		
Plumbing, electrical, heating		**$20.00**
Remodeling, Alterations, Repairs and Miscellaneous		
Structural and finish work		**$20/thousand or fraction thereof**
Plumbing, heating, electrical		**$20/thousand or fraction thereof**
Swimming pool, plus electrical and		
plumbing if required		**$20/thousand or fraction thereof**
Siding, reroofing, chimneys, decks		**$20/thousand or fraction thereof**
Wood or coal stoves		**$20/thousand or fraction thereof**
OTHER FEES		
House moving permit		**$100 plus septic test-repair**
(plus buidling permit to erect on a		
foundation if the house is moved within		
the Town)		

COLCHESTER HEALTH DEPARTMENT

FEE SCHEDULE
EFFECTIVE
MAY 1, 2009

Colchester, CT Fee Structure

SERVICE		FEES
Soils test- new lot		$100.00
Soils test- repair		$75.00
Site Plan review - new		$100.00
Site Plan review - repair		$50.00
Site plan review >2000 gpd		$100.00
Each revised site plan after one free revision		$150/lot
Subdivision, multi-lot plan review- subsurface sewage disposal		$50/lot
Each revised subdivision, multi-lot plan after one free revision - Subsurface system		$75/lot
Subdivision plan review - municipal sewered sites		$50/lot
Each revised site plan after one free revision - municipal sewer		$75/lot
Septic permit - new lot		$125.00
Septic permit - repair		$75.00
Septic permit > 2000gpd		$150.00
Septic permit > 2000gpd repair		$150.00
Well permit		$60.00
Mortgage/bank inspections		$25.00

Development Review Fee Structure

Town of Columbia

ORDINANCE FOR A NEW SCHEDULE OF ZONING FEES

SELECTMEN'S MINUTES BOOK 4 PAGE 83
SELECTMEN'S MINUTES BOOK 6 PAGE 609
SELECTMEN'S MINUTES BOOK 7 PAGE 1373
SELECTMEN'S MINUTES BOOK 9 PAGE 2297
SELECTMEN'S MINUTES BOOK 10 PAGE 2594
SELECTMEN'S MINUTES BOOK 10 PAGE 2619
SELECTMEN'S MINUTES BOOK 10 PAGE 2647

The new zoning fee schedule shall be as follows:

All changes/additions are in bold type throughout

*Subdivision/Modifications to same	**$50.00 per lot, min fee $250.00**
*Re-Subdivision/Modifications to same	**$50.00 per lot min fee $250.00**
*Subdivisions with Section 12.5a-e waivers	**$50.00 per lot min fee $250.00**
Engineering **for commercial project/** drainage/New Town Roads	**See outside consultant - TBD**
New Houses:(4 Inspections)	$100.00
Re-inspections	$ 25.00 each before Zoning Certificate
Decks, additions, barns, garages:	$25.00
Temporary Zoning Compliance	$100.00
Interior Renovations:	$10.00
Release Letter from Land Records	$100.00
*Special Exceptions:	$250.00
Toll/storage Shed:	$10.00
*Zone Change:	$250.00
*Amendments to Regulations:	$250.00

(Voted to be adopted at a special meeting of the Board of Selectmen held on January 12, 1984.)
(Effective date: February 7, 1984)
(Selectmen's Record Book 4 page 83)

Development Review Fee Structure

Town of Haddam

TOWN OF HADDAM
LAND USE OFFICE AND COMMISSION FEE SCHEDULE

LAND USE AND ZONING OFFICE

	St. Fee
Zoning Permit	$ 25.00 + 30.00 = 55.00
New Dwelling Zoning Permit	75.00 + 30.00 = 105.00
Erosion & Sedimentation Bond*	500.00 (all new Dwellings)
Driveway Permit	25.00 No St. Fee
Driveway Bond*	1,000.00 No St. Fee

*Land Use Office will accept checks only for bond fees.

PLANNING AND ZONING COMMISSION

	St. Fee
Subdivision Application	
Application fee per lot	75.00 + 30.00 = 105.00
Minimum Fee	150.00 + 30.00 = 180.00
Special Permit Application	
Application Fee (commercial or indust.)	75.00 + 30.00 = 105.00
Site Plan Review (commercial or	50.00 + 30.00 = 80.00
Change of Zone or Zoning Map	25.00 + 30.00 = 55.00
Public Notice Signage fee	75.00

ZONING BOARD OF APPEALS

Application for Variance	75.00 + 30.00 = 105.00

WETLAND COMMISSION

Application	50.00 + 30.00 = 80.00
SIGNIFICANT ACTIVITY	
($35.00/1,000 sq. feet of disturbed area)	
Renewal of Permit	25.00 + 30.00 = 55.00
Petition to amend map	450.00

APPROPRIATE APPLICATION FEES FOR NEW DWELLINGS:

Town of Haddam Fees include:

ZONING PERMIT	$ 75.00
EROSION & SEDIMENT CONTROL BOND	$500.00
DRIVEWAY PERMIT	$25.00
DRIVEWAY BOND	$1000.00
STATE OF CONNECTICUT ENVIRONMENTAL FEE	$30.00
BUILDING PERMIT FEE	see attached

Chatham Health District fee:
Application for Service, Site Plan Review $60.00

All of the above fees must be paid by check or cash.

NON-RESIDENTIAL APPLICANTS ONLY: In addition to the above, please include:

ONE SET OF PLANS FOR PROPOSED ACTIVITY FOR THE FIRE MARSHAL TO REVIEW SHOWING THE FOLLOWING:

a. Connecticut Fire Safety code:

i.Code Summary

1. Use Group
2. Type of Construction
3. Area & Height
4. Occupant Load
5. Egress Width
6. Fire Resistance Ratings
7. Fire Extinguishers
8. Fire Sprinkler Systems
9. Fire Alarm System
10. Smoke Detection System
11. Interior Finishes
12. Draftstopping
13. Handicap Requirements
14. Emergency Lighting

ii.Architectural:

1. Foundation Plan
2. Floor Plan
3. Elevations
4. Electrical Plans & Specifications
5. Mechanical Plans & Specifications
6. Plumbing Plans & Specifications

TOWN OF HADDAM
PERMIT FEE SCHEDULE

BE IT ORDAINED that a certain ordinance entitled "AN ORDINANCE CONCERNING THE ADOPTION OF A SCHEDULE OF FEES FOR PROCESSING: LAND USE APPLICATIONS; HEALTH DEPARTMENT PERMITS, REVIEWS AND INSPECTIONS; BUILDING PERMITS; AND DRIVEWAY PERMITS" adopted by the Town Meeting of the Town of Haddam on September 22, 1994 is hereby restated as follows:

The following fees shall be paid for processing building permit applications:

A. For Building Permit from Building Official – ($10.00) per $1,000.00 of construction cost based on fair market value; Minimum fee - $12.00

All building permits shall be based on this schedule at a **minimum** per the State of Connecticut Building Code. **No Exceptions**

1. **RESIDENTIAL PERMIT FEES** (One and Two Family Dwellings only)

Basement – Unfinished.....Inc. w/house
Finished.....$37.50 sq. ft.
Garage.....$15.00 sq. ft

Living Space.....$75.00 sq. ft

Garage/Barns.....$25.00 sq. ft.
Second Level Storage.....$12.50 sq. ft.

Decks.....$15.00 sq. ft.

Covered Porch.....$30.00 sq. ft.

Sheds (No Vehicle Storage).....$10.00 sq. ft.

Storage – Unfinished areas convertible to living space..$37.50 sq. ft.

2. **COMMERCIAL, INDUSTRIAL, RESIDENTIAL 1, 2, 3 USE GROUP** – per Marshall and Swift or fair market value cost estimate provided by Connecticut licensed design professional.

   A. Permit fee and initial plan review fee - $10/$1000 estimated cost of improvements or any part thereof.
   B. Secondary permits associated with primary construction permits - $12.00.
   C. Demolition works - $10/$1000 based on cost value of work (including disposal)
   D. State Building Fee of $.18 per thousand for **all** permits.

3. All other required permits based on cost value by applicant (subject to review by Building Official).

Fern Tremblay
Building Official
Effective September 1, 2004

Development Review Fee Structure

Town of Hebron

200 Attachment 1

Town of Hebron

Schedule of Fees

Building Permit and Application Fees

The fee for each plan review, building permit, inspection, and certificate shall be paid in accordance with the following schedule:

A. The fee for building permits shall be $12 for each $1,000 of construction value, or fraction thereof, with a minimum fee of $20.

B. A certificate of occupancy fee of $25 shall be assessed on all building permits that require a certificate of occupancy.

C. Mechanical, plumbing, fire protection, and electrical permit fees shall be calculated at the same rate as building permit fees, except that there will not be a certificate fee.

D. The permit fee for moved or relocated structures shall be based on the construction value for new construction.

Demolition Permit and Application Fee

A. The fee for a demolition permit shall be $12 for each $1,000 of construction value, or fraction thereof, with a minimum fee of $20.

Planning and Zoning Commission Fees

A. Zone boundary changes: $150 up to five acres; greater than five acres: $150, plus $10 per acre.

B. Amendments to zoning regulations, subdivision regulations, and plan of conservation and development: $150.

C. Site plan applications (including modifications): $150, plus $50 per 1,000 square feet of new construction.

D. Special permit applications:

1. Special permits: $200, plus $100 per 1,000 square feet of new construction.
2. Special permits for multifamily/cluster housing development: $250, plus $125 per lot/unit, plus $150 per 100 feet, or fraction thereof, of new roadway (public or private) or common driveway.
3. Modification to special permit: $150, plus $50 per 1,000 square feet of new construction.
4. Renewal of special permit by zoning agent: $50.

E. Subdivision application (including resubdivision applications): $250, plus $125 per lot, plus $150 per 100 feet, or fraction thereof, of new roadway (public or private) or common driveway.

F. Sign applications:

1. New freestanding signs: $100 each.
2. New attached signs: $50 each.
3. Modifications to existing signs: $25 each.
4. Temporary signs: $25 each.

G. Public improvements inspection fee: 4% of the cost of all site improvements as determined by the Town Engineer for all subdivisions and all special permits for multifamily/cluster developments.

H. Boundary adjustments, free splits, lot mergers: $50.

Zoning Board of Appeals Fees

A. Variance applications in residential districts: $125.

B. Variance applications in business districts: $200.

C. Applications for motor vehicle repairer or cluster locations: $200.

D. Appeals to determination of official: $250.

Conservation Commission/Inland Wetlands Agency Fees

A. Regulated uses: $60.

Residential uses.

Plus: $100 per lot.

Plus: Fee from Schedule A.

Commercial uses: $200.

Plus: Fee from Schedule A.

All other uses: $100.

B. Permitted and nonregulated uses.

Permitted uses of right: No charge.

Nonregulated uses: $45.

C. Significant activity fee: $150.

D. Map amendment petitions: $175, plus fee from Schedule B.

E. Modification of previous approval: $25.

F. Detention/retention ponds (each): $200.

G. Storm drains and plunge pools (each): $100.

Schedule A. For the purpose of calculating the permit application fee, the regulated area in Schedule A is the total area of wetlands and watercourses upon which regulated activity is proposed.

Regulated Area (square feet)	**Fee Per 1,000 Square Feet Regulated Area**
a. Less than 2,500	$18.00
b. 2,500 to 50,000	"a" plus $12.00
c. More than 50,000	"b" plus $6.00

Schedule B. For the purpose of calculating the map amendment petition fee, the regulated area in Schedule B is the total length of wetlands and watercourses boundary subject to the proposed boundary change.

Regulated Area (linear feet)	**Fee Per 100 Linear Feet Regulated Area**
a. Less than 500	$20.00
b. 500 to 1,000	"a" plus $15.00
c. More than 1,000	"b" plus $8.00

Driveway permit fee: $25.

Road excavation permit fee: $25.

Development Review Fee Structure

Town of Marlborough

The applicant shall pay a fee equal to the Town's expenditures in hiring outside consultants to review any land-use applications. The fees will be determined by the Town through obtaining an estimate from its consultants based on the nature of the application and application submittal and multiply that fee by 1.5. The applicant shall make a payment the Town prior to the Land Use Commission holding a public hearing for said application within five business days of receiving notice of the amount due. If the Town expenditure exceeds the estimate the applicant shall submit additional funds within five (5) days upon receiving notice from the Town. Any fees remaining after the completion of the application review will be returned to the applicant.

The applicant shall pay an inspection fee of eight (8%) percent of the cost of the improvements made to property relating to site work including drainage, erosion and sediment controls, pavement, landscaping, and any other required inspection to insure construction is in compliance with Town Standards. The applicant shall make a payment the Town prior to the Land Use Commission holding a public hearing for said application within five business days of receiving notice of the amount due. If the Town expenditure exceeds the estimate the applicant shall submit additional funds within five (5) days upon receiving notice from the Town.