

## **STORMWATER AND WHAT IT MEANS TO BURLINGTON**

Burlington Public Works

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### **INTRODUCTION**

Stormwater runoff is a natural part of the hydrologic cycle. Rain falling on undeveloped land is intercepted by vegetation such as trees, plants and grasses. Much of it infiltrates into the soil to recharge groundwater supplies while some of it is transpired by plants back into the atmosphere and some becomes surface runoff. Impervious land cover (i.e. roads, buildings, parking lots, etc.) from urban development alters the natural hydrologic cycle by increasing surface runoff, decreasing transpiration and groundwater recharge. According to the Center for Watershed Protection ([www.cwp.org](http://www.cwp.org)), as little as 10% impervious cover in small watersheds can negatively alter streams by increasing the peak flows and correspondingly erosion during storm events plus reduce groundwater recharge and base flows during dry periods. In addition to *water quantity* changes, this stormwater can change *water quality* by adding contaminants such as trash, sediment, petroleum products, heavy metals, bacteria, pesticides and nutrients. In Vermont alone, there are currently 17 rivers and streams that do not meet Water Quality Standards primarily due to runoff from impervious surfaces. These water quality changes prompted the Environmental Protection Agency (EPA) to enact Phase I and Phase II stormwater programs to regulate stormwater discharges in urban areas as well as discharges from large construction activities.

### **BURLINGTON'S SYSTEM**

The City of Burlington is responsible to maintain water mains, sewer pipes, stormwater pipes, manholes and catch basins in order to deliver potable drinking water, collect wastes and drain stormwater runoff from streets plus other impervious areas for the health and safety of its citizens. In summary we maintain approximately 100 miles of storm, sewer and combined pipes, 40% of which is strictly stormwater collection. Connected to this pipe network are roughly 2000 catch basins that collect surface runoff and 2600 manholes to provide access to the system for maintenance and to facilitate changes in grade (elevation) or line (direction) for the pipes. Being an older city, parts of the collection system that were laid 50+ years ago before wastewater treatment tends to be a combined sewer system where wastewater (sewage) and stormwater are mixed together in a single pipe during storm or snowmelt events. Since the last upgrade completed in 1994, combined sewage now receives treatment at our Main Wastewater Treatment Facility. The newer collection system now involves two sets of pipes, one for wastewater and one for stormwater. The wastewater system flows to one of our three facilities for treatment, while the stormwater system collects and discharges runoff or snowmelt directly or indirectly into nearby waters of the state. We have located and sampled 50 outfalls throughout the city that discharge directly to Lake Champlain or flow indirectly via the Winooski River, Intervale, Englesby Brook, Centennial Brook, Potash Brook and even some unnamed tributaries (Figure 1).

## STORMWATER PROGRAMS

Burlington Public Works has absorbed the tasks of maintenance and capital of our stormwater system. In addition, it has taken on responsibility for management of its EPA Phase II stormwater permit program. Our plan and annual reports can be downloaded from the Public Works website at <http://www.dpw.ci.burlington.vt.us/water/stormwater.htm>

One aspect of our plan to meet the requirement of public education and outreach has been Burlington's participation with several other MS4 communities in the formation of the Regional Stormwater Education Program (RSEP) in 2003. Instead of each community going it alone we have joined and pooled \$5,000 each annually from all members leveraging a much better outreach effort. Information on RSEP can be viewed at our website [www.smartwaterways.org](http://www.smartwaterways.org).

Stormwater related work is expensive. Burlington estimates it spends over \$200K annually to perform stormwater related simple capital and maintenance tasks. Normal maintenance tasks like street sweeping and catch basin cleaning has become increasingly expensive due to the lack of permitted dump sites and the requirement to pay standard tipping fees of over \$90 per ton to privately owned landfills. A stormwater line item in the street capital budget of \$75K is typically expended on only one or two projects annually.

We have been fortunate to be the recipient of capital grants from Green Mountain Power and the EPA to restore Englesby Brook, and more recently a Lake Champlain Basin Program grant to remove pollutants into Lake Champlain from the College Street stormdrain system. Over \$2M has been spent in Englesby alone to develop a watershed plan, clean up trash, expand a pond at the Burlington Country Club to treat stormwater, design/construct a new storm pond and wetland to control and treat runoff from over 160 acres of the watershed, partner with USGS in construction a stream gaging station near the mouth of the brook, and sponsor participation in RSEP. The estimated budget to install an underground treatment system for College Street is between \$200K and \$300K.

In terms of new development or redevelopment, Public Works and Planning & Zoning work together to review projects for stormwater that trigger the development review process. Conditions are frequently placed on projects to manage stormwater both during and after construction. Our current ordinances do not adequately address stormwater management. This situation will be corrected once the new ordinances are adopted. The areas that have room for improvement are defining which departments are responsible for inspection and enforcement during and after construction.

## FUNDING STORMWATER

In 2005 DPW hired Hoyle, Tanner & Assoc. and AMEC Earth & Environmental to investigate the potential feasibility of using a stormwater user fee mechanism to fund a program that would enhance the local stormwater program and meet local program needs. We spent a day doing what they term a DIMS study (does it make sense). Other than DPW staff, others including CFO Brendan Keleher and City Councilor Bill Keogh attended.

According to stormwater expert Andrew Reese from the consulting firm AMEC, a Phase II program can cost communities of our size anywhere from under \$100K to over \$1M annually, obviously depending on the level of effort the community wishes to undertake. This level of effort can range from meeting the EPA's minimum requirements to engaging in the control and treatment of most if not all stormwater discharges. The outcome of our DIMS work led HTA and AMEC to offer some next steps and an evolutionary approach to stormwater. This DIMS report can be provided for further information.

While there are many ways to pay for stormwater, the fairest mechanism is the development of a utility that charges property owners by the amount of impervious cover on their parcels. South Burlington is the first municipality in Vermont to develop a stormwater utility and whose success or failure depends on how they planned and manage their program.

No matter what, stormwater issues are not going to go away. It will need the understanding, cooperation and support from everyone in the community.

FIGURE 1

