



CITY OF BURLINGTON
PHASE II STORMWATER
2006 ANNUAL REPORT

General Permit #3-9014
NPDES Permit #VTR040000

Submitted by:
Burlington Public Works

April 2007

A. INTRODUCTION

This report is being submitted as part of the City of Burlington's Phase II Stormwater Plan per the NPDES (National Pollution Discharge Elimination System) requirements. It follows the same format used in previous years and includes the following information as discussed in Section H of the city's plan:

- Status of compliance with permit conditions.
- Results of information collected.
- A summary of stormwater activities planned for the next annual cycle.
- Any proposed changes as outlined in Section F of the stormwater plan.
- If applicable, provide notice as to whether or not another entity is responsible for any of the permit obligations.

It is important to note that a Stormwater Task Force has been developed to help address regulatory, technical and budgetary issues associated with stormwater in Burlington. This Task Force is comprised of city officials from the Code Enforcement, Community & Economic Development, Planning & Zoning, and Public Works Departments as well as community members from the Burlington Conservation Board and representatives from the Vermont League of Cities & Towns.

Also, the Englesby Brook treatment systems were completed in the spring of 2006. Although discussed further in Section C of this report, monitoring is planned in 2007.

B. STATUS OF COMPLIANCE WITH PERMIT CONDITIONS AND INFORMATION RESULTS

This section will outline the tasks proposed in the original stormwater Phase II plan, the status of compliance with the plan, and applicable results. Each of these tasks are arranged in accordance with the required six minimum control measures.

1. Public Education/Outreach Program

The City of Burlington continues to be a participant in the Chittenden County Regional Stormwater Education Program (RSEP) in accordance with section E1 of the stormwater plan.

Marketing Partners Inc., a local marketing consultant, was originally selected to develop this 5 year program based upon their experience and commitment to socially responsible projects. In 2004, they launched a media campaign that included television and radio ads, newspaper ads, news releases and the regional stormwater website located at: www.smartwaterways.org.

In 2005, they started paid media campaigns throughout Chittenden County.

In 2006, they updated the website by adding a science viewer to the existing Stormville animation, conducted a paid media campaign throughout Chittenden County in spring 2006, developed a partnership with the State's Clean and Clear program, and compiled website and

media tracking data in order to monitor outreach effectiveness. Appendix A at the end of this report lists all the above activities plus a few more accomplishments by our consultant.

Approximately 100 permanent stormdrain markers were installed by Public Works personnel along College, Battery and Main streets with the intent of making the public aware that everything ultimately drains to Lake Champlain. This program will continue in 2007.

2. Public Involvement/Participation

On May 6, 2006 the Community and Economic Development Office (CEDO) once again played a key role in sponsoring Green Up Day in Burlington. A total of over 400 volunteers collected 364 bags of garbage and groomed the greenbelts that entailed raking debris and leaves. As you can see from the photos in Appendix B, CEDO makes Green Up fun!

Like in previous years the Englesby Brook watershed was also targeted on Green Up Day for trash removal. Debris sites in Englesby were mapped ahead of time by Public Works and a handful of volunteers were sent to different areas of the watershed. The Parks Department later collected all the trash, which included paper and plastic, metals, tires and shopping carts that had been dumped into the brook. The total volume of debris collected amounted to 2 small dump truck loads.

The annual Edmunds Middle School stormdrain stenciling project was unfortunately cancelled due to rain on both the selected and rain dates.

3. Illicit Discharge and Elimination

An illicit discharge monitoring program was initiated in 2004 in accordance with the Phase II plan. All of the stormwater outfalls mapped in 2003 were visited and were sampled whenever possible. In order to look for direct or indirect wastewater discharges into stormwater systems, grab samples for *E. Coli* bacteria were taken on those outfalls that had dry weather flow and pads for optical brightener (OB) testing were placed in all outfalls. The optical brightener test is a low cost procedure that detects fluorescent white dyes added to nearly all the laundry detergents to whiten cotton fabrics without the use of chlorine bleach. These dyes fluoresce in the blue region of the visible spectrum when exposed to longwave ultraviolet (UV) light. Unbleached cotton pads are placed in stormwater outfalls where they continuously sample flow and absorb traces of this dye, if present, for the period of time they are in service, usually 1 to 2 weeks. The pads are removed, dried and then viewed under a UV lamp. Pads from stormwater outfalls that fluoresce more than the control pad would indicate a possible direct or indirect contamination from wastewater. More information can be found on this procedure at: <http://www.naturecompass.org/8tb/sampling/>. Appendix C at the end of this document shows the outfall locations along with discharge monitoring reports for sampled outfalls in a format approved by the Vermont Department of Environmental Conservation (VTDEC).

In the fall of 2004 an illicit discharge was discovered in a Plattsburgh Avenue outfall that flows into the Winooski River. Extensive bacteria and video work around Plattsburgh Avenue resulted in finding a house sewer connection into the stormwater pipe on Turf Road. The property owner was alerted to this situation and corrected the problem within a few weeks of notice. A follow up *E. Coli* sample a few weeks after the separation work showed bacteria concentrations greatly reduced but still above background levels. It was believed that with the absence of storm events to flush residual solids out of the pipe network we were seeing bacteria from this household discharge. While the first sample in January 2005 still had elevated bacteria levels a later sample had low bacteria levels, confirming that this discharge was eliminated.

A second illicit discharge was detected in a stormwater outfall that serves Shelburne Street and discharges into Englesby Brook. The source of contamination ended up being a leaking sewer pipe crossing through a stormwater pipe at the intersection of Shelburne and Hadley Streets in South Burlington. A new manhole was installed in May 2005 and subsequent samples confirmed this illicit discharge was also eliminated.

The Alexis Drive stormwater outfall continues to have high bacteria counts this year as in previous years. Although the source has not yet been found, what we do know is that the bacteria counts increase within the detention area. During the last sample date, we noticed raccoon tracks all over this area. Additional testing is planned in 2007 to help us determine whether the source of bacteria is human or animal.

4. Construction Site Stormwater Runoff Control

It is the opinion of the city that erosion is generated by all projects that disturb soils and that construction site erosion can be controlled in all cases. An erosion and sediment control checklist was submitted for review in the 2004 Annual Report, and has been modified over the years.

The city is still undergoing a complete zoning rewrite that will include a comprehensive section on stormwater management for projects that increase impervious surface or disturbed area by more than 400 square feet. This draft stormwater section includes requirements for the applicant to submit an Erosion Prevention Sediment Control (EPSC) Plan that shall include means and methods to control sediment on construction sites and prevent it from migrating offsite. [Appendix D](#) includes the latest draft zoning ordinance pertaining to stormwater and erosion control.

The VTDEC has requested that the city provide a list of projects under construction in 2006 that met the one acre impervious and the new one acre disturbed area thresholds for state permitting requirements. While the city's database still does not record this particular data, the table below lists large projects that were under construction or completed in 2006. VTDEC should be able to cross-reference this list against their stormwater permit applicants.

PROJECT ADDRESS	APPLICANT(S)	PROJECT DESCRIPTION
590 Main Street	UVM	Student Center – Gateway Commons
Battery/Cherry Streets	City/Retrov/Westlake	Hotel, Condos, Offices, Parking Garage
Institute Road	Burlington Schools	Athletic Fields
109 Carrigan Drive	UVM	Addition to Marsh Life Science Building
166 East Avenue	Burl. Cohousing Grp	Cohousing Project
235 East Avenue	Am. Cancer Society	Hope Lodge Cancer Patient Housing

5. Post-Construction Stormwater Management in New Development and Redevelopment

Our permit plan included recommendations that all developments and redevelopments at least attempt to meet standards set forth in the 2002 VTDEC Stormwater Management Manuals, and have the city create a requirement that all projects disturbing one acre or more of land conform to these standards. These requirements were informally started in 2003. Through the Technical Review Committee process, Public Works has been able to add this condition to projects. Those projects that have structural treatment systems are also required to provide an operation and maintenance (O&M) plan for their system.

The City’s draft zoning ordinance on Stormwater and Erosion Control standards mentioned in the previous section and in Appendix D includes requirements for a Stormwater Management Plan. This plan shall include the creation of a formal maintenance covenant that outlines inspection schedules as well as documenting responsible parties for said maintenance activities.

This proposed zoning ordinances also include a section for a Natural Resources Overlay District to help protect surface waters and wetlands. Appendix E contains this draft which addresses four subareas:

- Riparian and Littoral Conservation Zone
- Wetland Conservation Zone
- Natural Areas Zone
- Flood Hazard Zone

In essence, this ordinance establishes buffer zones of varying distances from water, wetlands and natural areas.

6. Pollution Prevention and Good Housekeeping for Municipal Operations

In August 2006, the State of Vermont issued their requirements for a Multi-Sector General Permit. The MSGP is a federally mandated National Pollutant Discharge Elimination System (NPDES) permit that covers new and existing discharges of stormwater from industrial facilities. Many of these facilities conduct activities and use materials that have the potential to impact the quality of Vermont’s waters. This permit requires facilities to examine potential sources of pollution, implement measures to reduce the risk of stormwater contamination, and test stormwater discharges for sources

of pollution. In Vermont, the Department of Environmental Conservation is the permitting authority and administers the MSGP. Permit coverage is required by private and municipal industries identified on the MSGP Standard Industrial Classification (SIC) code list. More information on the MSGP can be obtained from the State's website at: http://www.anr.state.vt.us/dec/waterq/stormwater/htm/sw_msgp.htm

The city has already been approved for No Exposure certifications for its three (3) wastewater treatment facilities since all equipment and materials are protected from precipitation. We will shortly be filing for No Exposure certifications for Burlington's two (2) closed landfills since they were capped in accordance with State-approved closure plans and are being monitored as required.

According to the FAQ section of the State's website, municipal garages are exempt from filing for MSGPs. However, the city realizes that these garages can be sources of stormwater pollution. We will be performing an internal audit to see where we can reduce our impact to the environment.

A system for the inspection, cleaning and repair of catch basins continued in 2006. According to the right-of-way group in Public Works, there were 42 basins rebuilt and 50 basins cleaned, with 40 to 50 cubic yards of sediment removed.

All city streets were swept 8 to 10 times in 2006 with an estimated 600 to 800 cubic yards of sediment removed.

C. ACTIVITIES PLANNED FOR THE CURRENT ANNUAL CYCLE

This section outlines all activities planned for 2007 in accordance with the approved stormwater management plan.

1. Public Education/Outreach Program

As noted above, the RSEP consultant will continue media spots and modify the website as necessary to increase awareness of stormwater pollution. Burlington will continue to fund its share of this effort. Stormwater workshops are being planned by Public Works, most likely through the Neighborhood Planning Assemblies (NPA) to show people ways to minimize their environmental impact. More permanent stormdrain markers will be installed along busy city streets by Public Works personnel where stenciling by volunteers would be prohibitive for safety reasons.

2. Public Involvement/Participation

Clean-Up Day 2007 will be once again sponsored by Burlington, throughout the city and in Englesby Brook in the form of debris pickup and disposal. Additional stormdrain stenciling projects are planned.

3. Illicit Discharge and Elimination

As mentioned above, monitoring will continue in 2007 in the Alexis Drive collection system to determine the source of bacterial contamination. A random sampling of a few

other discharge points is also planned.

4. Construction Site Stormwater Runoff Control

We expect adoption of the new zoning ordinances this year which will increase stormwater management requirements for the construction phase of projects. The city's draft Erosion & Sediment Control Plan Worksheet for Small Projects has gone through a number of iterations over the years and is expected to be utilized in 2007 for internal and other projects that fall under the zoning thresholds.

5. Post-Construction Stormwater Management in New Development and Redevelopment

Since 2003, the city has been requesting or requiring that developers attempt to meet the standards set forth in the 2002 Vermont Stormwater Manual, depending on project size. The new zoning ordinances (Appendix D) will increase city requirements for new development and redevelopment.

6. Pollution Prevention and Good Housekeeping for Municipal Operations

As mentioned above, municipal garages are exempt from filing for a Multi Sector General Permit for stormwater. However, the city realizes that these garages can be sources of stormwater pollution. We will be performing an internal audit to see where we can reduce our impact to the environment.

The purchase of erosion control materials and training is planned in 2007 for the Public Works crews that maintain the city infrastructure. Public Works will also coordinate with other city departments that perform duties which involve excavation for new or maintenance of existing utilities.

Maintenance of existing stormdrain systems will continue in the form of catch basin repair and/or cleaning, outfall repair, etc.

Although not currently required by this or any other permit, the city is proud to announce that more Englesby Brook stormwater treatment systems were completed early in 2006. A new stormwater pond located on city property adjacent to the School Maintenance Building at 287 Shelburne Road treats stormwater from an existing 130 acre subwatershed along Shelburne Road that previously discharged untreated flow into the brook. A shallow marsh/wetland also on city property treats flow from an existing 44 acre drainage area in the south end of the city. According to the authors of the Englesby Brook Watershed Restoration Plan (2001), these combined systems should remove over 20,000 pounds of sediment and 40 pounds of phosphorus annually. A partnership between the city, USGS and the University of Vermont is in planning stages for monitoring the effectiveness of these stormwater systems. Photos of these systems can be seen in [Appendix F](#).

A grant application to the Lake Champlain Watershed Environmental Assistance Program was approved in the fall of 2006. This program is a federally funded cooperative program between the applicant, Lake Champlain Basin Program (LCBP) and

the U.S. Army Corps of Engineers (USACE). The city submitted a proposal to provide treatment for the College Street stormdrain system, a highly urban 23 acre watershed that has been estimated to be 76% impervious and drains directly into Lake Champlain. While the original proposal was written around a single centralized hydrodynamic separator, after more input and research we're looking into decentralized systems that can hopefully provide better pollutant removal at a reduced project cost.

D. PROPOSED CHANGES TO THE STORMWATER PLAN OR TIMELINE

Each year our annual reports had included the original five year permit cycle timeline showing proposed tasks with estimated start/stop dates, plus a revised timeline showing a shifting of some tasks. These timelines did not include new tasks pertaining to stormwater for Burlington nor did they explain that some of the tasks were outside of the control of certain city departments (i.e. the timeliness of the proposed zoning ordinances). Therefore, we decided not to include timelines in this year's report.

In essence, the City of Burlington is meeting all of the goals outlined in its Phase II permit. As long as we complete the activities outlined above in 2007 our organization will be satisfied with the accomplishments given the available resources.

E. CHANGE IN RESPONSIBILITY FOR PERMIT OBLIGATIONS

At this time, there are no changes in responsibility for any of the tasks outline in the approved plan.

F. CERTIFICATION

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Steven Goodkind, P.E. Director of Public Works

Date Signed

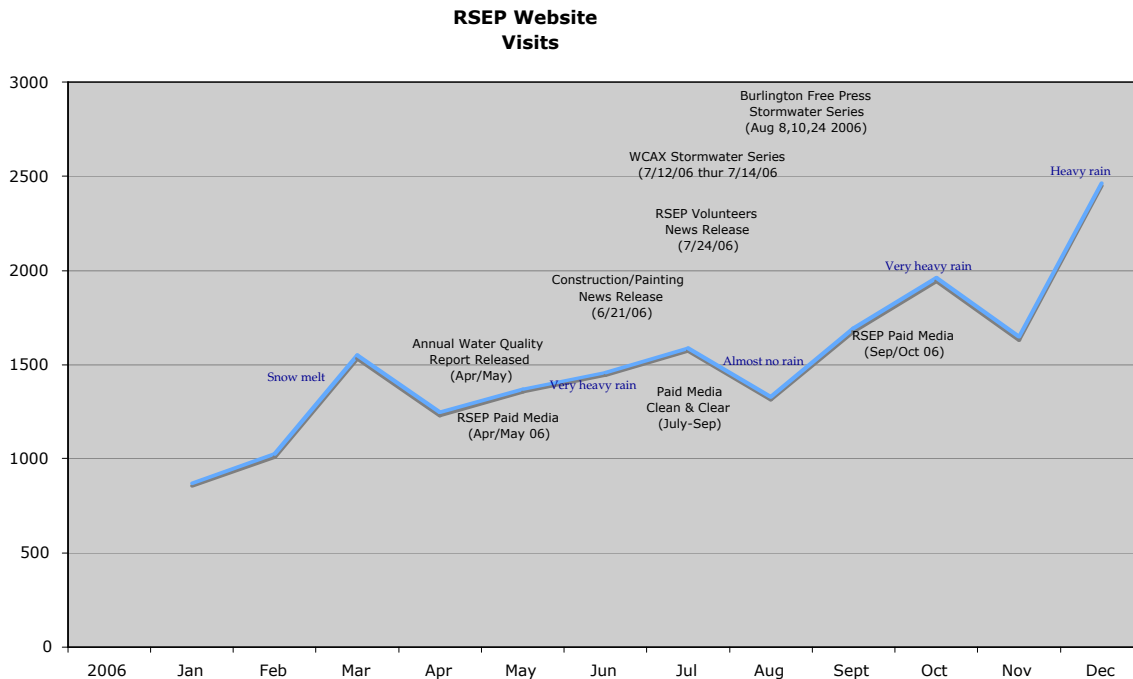
APPENDIX A – REGIONAL STORMWATER EDUCATIONAL PROGRAM 2006

During 2006, RSEP continued its work on a public education and outreach campaign. The multifaceted campaign included both paid and unpaid media, with an overall goal of increasing awareness and understanding of stormwater runoff pollution, prevention methods, and the connection between stormwater runoff and water quality. Marketing Partners, Inc. continues to work on contract with RSEP on the public outreach campaign.

During the 2006 calendar year, RSEP accomplished various goals outlined in the Communication Plans for Program Years 2005-2006 and 2006-2007. The accomplishments include:

- Updated the Communication Plan identifying goals, modifying strategies and program objectives for the upcoming year.
- Made website updates and enhanced the website by adding “Science Viewer” to existing Stormville animation, adding more depth and scientific explanation to the content in Stormville. “Science Viewer” content was designed to reach a teen/young adult audience segment with RSEP’s 5 key messages.
- Conducted a paid media campaign throughout Chittenden County in spring 2006 that includes four weeks of print ads in nine community papers, spots airing on three of the top radio stations, highly targeted broadcast television and an eight week schedule of cable television. A fall campaign of an additional four weeks of print, two weeks of radio and four weeks of broadcast completed the 2006 campaign.
- Created increased visibility on stormwater runoff throughout Chittenden Country, by partnering with Governor James Douglas’ Clean & Clear Action Plan.
- Compiled website and other media visibility tracking data in order to monitor outreach effectiveness. (See below for summary tracking data.)
- Continued to collaborate with partners, such as the Governor’s Clean & Clear Action Plan and public school officials, in furthering stormwater education outreach.

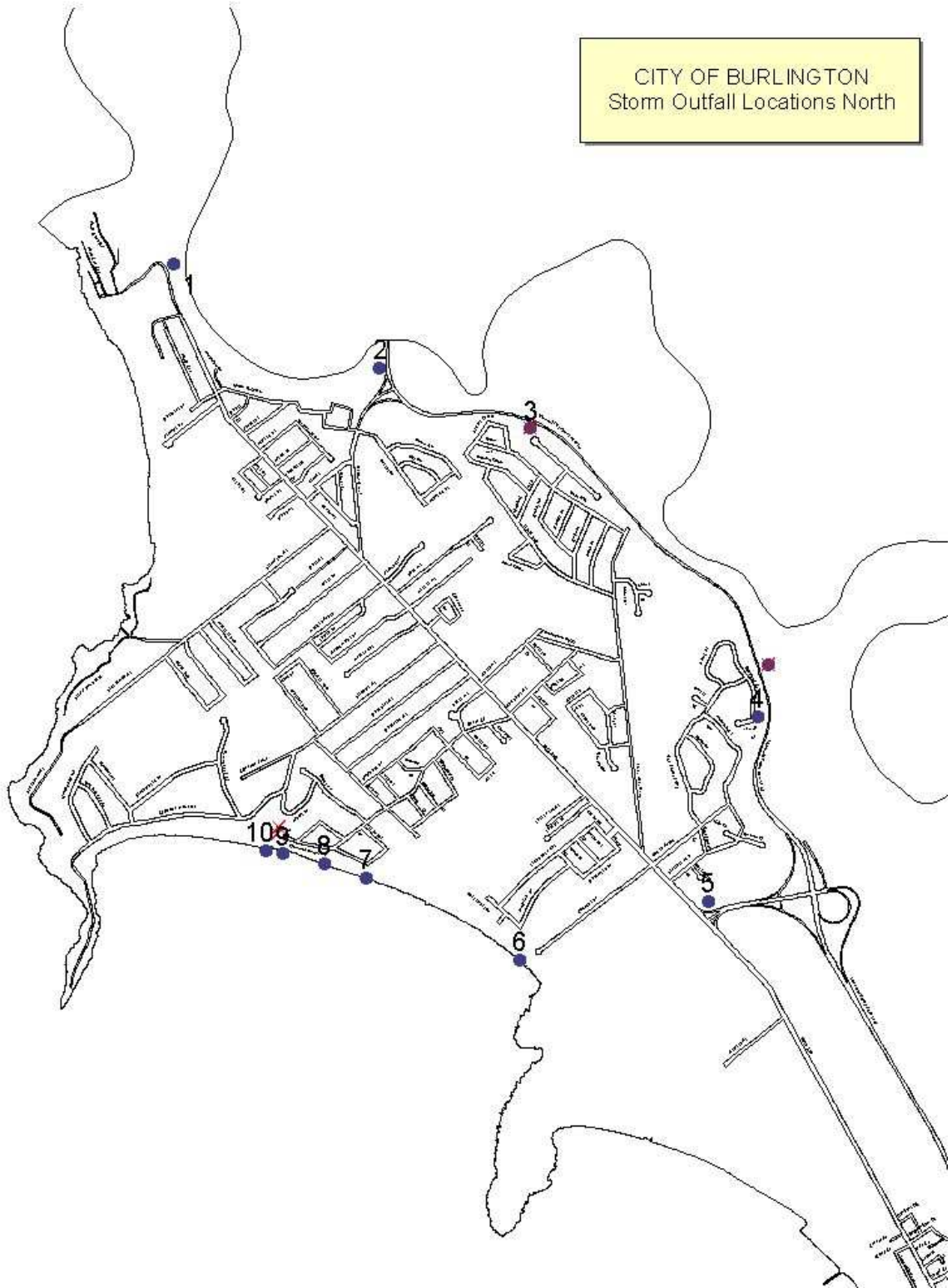
Below is the website impression information for 2006. Website traffic increases are marked in conjunction with paid and unpaid media.

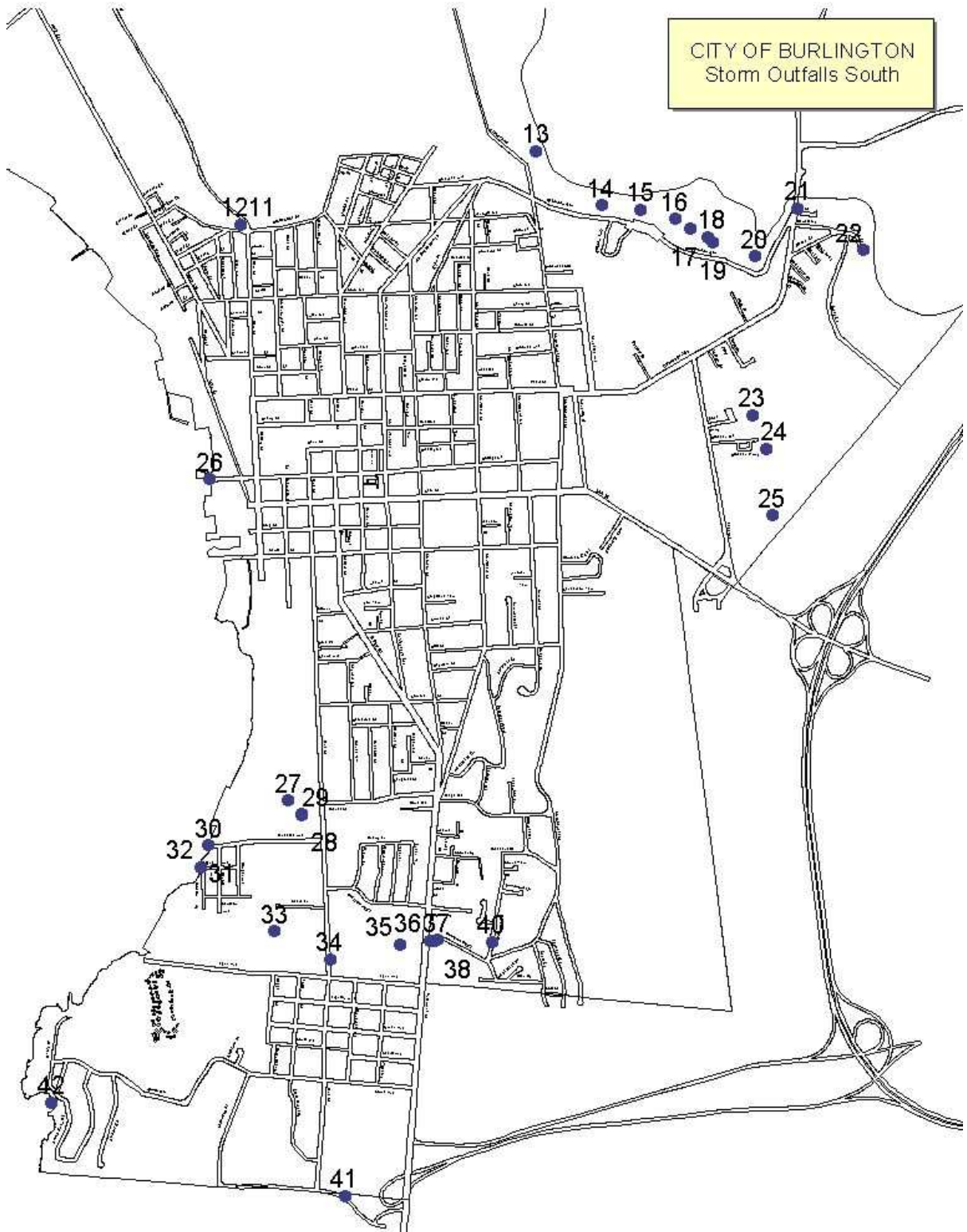


APPENDIX B – GREEN UP 2006



APPENDIX C – OUTFALL LOCATIONS AND DISCHARGE MONITORING REPORTS





MONITORING REPORT FOR DISCHARGES FROM MUNICIPAL STORM SEWER SYSTEMS AUTHORIZED BY GENERAL PERMIT #3-9014

MS4: Burlington Comments/Additional Information: Illicit Discharge Corrected
 Discharge Point Name: Map ID #10, Alexis Drive Stormwater System
 Location: Off Appletree Point Road
 Watershed/Drainage: Lake Champlain
 Monitoring Date(s): 8/28/06
 Sample Collected By: S. Roy
 Analyst or Laboratory: Main WWTP Lab
 Date(s) of Analysis: 8/28/06
 Analytical Methods: Standard Methods 9223 (*E. Coli*)

Date/Time	Parameter	Units	Results	Comments
8/28 1400	<i>E. Coli</i>	cfu/100mls	413	Detention Area Upper Headwall
8/28 1405	<i>E. Coli</i>	cfu/100mls	14,136	Detention Area Lower Headwall
8/28 1425	<i>E. Coli</i>	cfu/100mls	19,863	Outfall

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Approved by: *Steven Goodkind* (Authorized Agent for Permittee)

APPENDIX D – DRAFT STORMWATER AND EROSION CONTROL STANDARDS

Sec. 5.5.3 Stormwater and Erosion Control

The purpose of this Section is to establish minimum stormwater management requirements and erosion controls to protect and safeguard the general health, safety, and welfare of the public residing within this community. This ordinance seeks to meet that purpose through the following objectives:

- minimize stormwater runoff from development in order to reduce flooding, siltation, streambank erosion, and to maintain the integrity of natural stream channels;
- prevent erosion and the transport of sediment and pollutants off lot, onto the City of Burlington streets and sidewalks, into the City of Burlington stormwater system, and/or waters of the State;
- minimize the effects of non-point source pollution on local surface and subsurface water quality;
- minimize the total volume of surface water runoff that flows from any specific site during and following development in order to replicate the pre-development hydrology to the maximum extent practicable;
- reduce stormwater runoff rates and volumes, soil erosion and non-point source pollution, wherever possible, through stormwater management controls and to ensure that these management controls are properly maintained and pose no threat to public safety;
- wherever possible provide stormwater management and erosion control strategies that lead to an overall improvement in the quality of the waters of the state; and,
- meet the requirements of the Vermont's 2002 Stormwater Management Rules and Guidance Vol. I and II (or latest State standard).

Applicability

This Section shall apply to all new development and redevelopment projects for which Major Impact Review is required pursuant to the requirements of Article 3, and/or those where a 400 square foot or more increase in impervious surface or amount of disturbed area is proposed and/or, regardless of the amount of impervious surface or disturbed area proposed, where any change in existing hydrological conditions is proposed. All projects must meet "as best possible" the requirements of Vermont's current stormwater standards. The City Engineer at the Department of Public Works shall determine whether the stormwater requirements have been met as best possible. Applicable stormwater management and erosion control standards shall be determined by whether a project is subject to Major Impact review or not.

All projects subject to Part (D) shall receive Department of Public Works review prior to receiving any Major Impact review approval or zoning permit.

Exemptions

The following activities are exempt from these stormwater performance criteria:

- (1) Any silvicultural and agricultural activity undertaken consistent with applicable Acceptable Management Practices (AMP) published by the state of Vermont.

Design Manual

The Dept. of Public Works may furnish additional policy, criteria, and information, for the proper implementation of the requirements of this Section and may provide such information in a Design Manual which may include a list of acceptable stormwater treatment practices, including the specific design criteria for each stormwater practice. The manual may be updated and expanded from time to time, at the discretion of the Dept. of Public Works, based on improvements in engineering, science, monitoring, and local maintenance experience. Stormwater treatment practices that are designed and constructed in accordance with these design and sizing criteria will be presumed to meet the minimum water quality performance standards.

Erosion Control and Stormwater Management Standards – Major Impact Projects

1.) Application Submittal Requirements - Erosion Prevention Sediment Control (ESPC) Plan:

Unless otherwise exempted by this Article, every zoning permit application involving Major Impact Review shall be accompanied by an “Erosion Prevention Sediment Control (ESPC) Plan” in order for the permit application to be considered. The ESPC Plan shall:

- a) Identify the contractor who is responsible for installing, implementing, and maintaining the EPSC plan and measures;
- b) Identify the onsite contractor who is responsible for the day-to-day monitoring, oversight, and inspections required by the EPSC plan;
- c) Assure that any amendments to the project EPSC plan are filed with the Department of Public Works and the Development Review Board;
- d) Provide that the erosion control measures remain in place until vegetation has become established on all disturbed surfaces and clearly identify under what conditions final site stabilization has occurred; and,
- e) Provide a process whereby the Department of Public Works and Code Enforcement participate in the final site stabilization program.

The Erosion Prevention Sediment Control Plan shall seek to:

- a) Prevent erosion and the transport of sediment off lot, onto the public streets and sidewalks, into the municipal stormwater system, and/or waters of the State;
- b) Prevent parking of any construction or construction related vehicles on City owned green space. Damage to green space shall be immediately addressed;
- c) Take any and all steps necessary to abate erosion and to clean up all resulting sediment deposited, discharged or found to exist off lot, on City streets and sidewalks, and/or in the City stormwater system;
- d) Maintain project erosion prevention and sediment control devices/measures and perform requisite cleanup of resulting sedimentation. This may include, but is not limited to, daily sweeping of streets and sidewalks and cleaning City stormwater catch basins;
- e) Specify appropriate seed and fertilizer applications that are ecologically sound and site specific;
- f) Specify an appropriate mulch when and where needed and adequate anchoring measures to prevent blow away;
- g) Specify an effective grass re-vegetation program. Turf replacement is recommended in areas where re-vegetation of grass proves difficult with seeding and mulch. To reestablish all existing and proposed green space and where practical consider porous (pervious) pavers;
- h) Engage the contractor to be proactive in planning and executing construction phase activities with the goal of preventing erosion and controlling sediment;
- i) Identify the parties to the EPSC plan and clearly define their respective roles and responsibilities including, but not limited to, the contractor, the onsite coordinator, those responsible for project adherence to the EPSC, and those participating in inspections and acceptance of final site stabilization; and,
- j) Define the overall strategy for the EPSC plan by:
 - i) Limiting actual disturbance area and time of disturbance;
 - ii) Employing proper site stabilization (addressing soil preparation for final seeding and landscaping, seed, pesticide/herbicide use, and mulch);
 - iii) Specifying stone and/or grass swale lining where appropriate;
 - iv) Specifying where necessary to employ erosion control blankets or mats;
 - v) Specifying locations for silt fence and construction barrier fence; and,

- vi) Specifying catch basin inlet protection during construction clean up and maintenance and after construction system operation and maintenance.

Prior to issuance of a certificate of occupancy, the project engineer must certify in writing that, among other things, the project EPSC plan as approved by the Department of Public Works has been complied with and final site stabilization has occurred. This certification shall be filed with the Department of Planning & Zoning.

Information requirements for the Erosion Prevention Sediment Control Plan may be adjusted or waived by the City Engineer for a particular development application upon written request of the applicant, provided that at least one of the following circumstances can be demonstrated:

- a) Alternative measures for on-site and/or off-site management of stormwater have been proposed, and these measures comply with local ordinance(s).
- b) It is otherwise demonstrated that the proposed development will not produce any significant change to the existing pre-application hydrology.

2.) Application Submittal Requirements - Stormwater Management Plan:

Unless otherwise exempted by this Article, every zoning permit application requiring Major Impact Review must be accompanied by a “Stormwater Management Plan” in order for the application to be considered. The City shall prescribe the form(s) and information that shall be submitted to determine compliance with this Section, with sufficient copies for necessary referrals and records. The requirements for stormwater management facilities may be waived in whole or in part by the development review board, provided that it is demonstrated by the applicant that at least one of the following conditions applies:

- a) Alternative measures for on-site and/or off-site management of stormwater have been proposed, and these measures comply with local ordinance(s).
- b) It is otherwise demonstrated that the proposed development will not produce any significant change to the existing pre-application hydrology.

3.) General Performance Criteria for Stormwater Management:

The latest edition of the Vermont Stormwater Management Manual shall be used as the standard for general performance criteria for stormwater management.

4.) Integrated Management Practices:

Applicants shall utilize Integrated Management Practices/Best Management Practices to meet the standards established in 3 above using one or more approved design options. Low Impact Design options are encouraged. Descriptions and standard details of approved Integrated Management Consideration shall be given in all stormwater management strategies to the relationship between temporary facilities required and installed during

construction as part of soil erosion and sedimentation control regulations; and permanent facilities designed to manage stormwater post construction on an on-going basis.

5.) Maintenance:

Stormwater Management Facilities that are constructed on privately-owned land and that are not within a public easement shall be maintained by the owner of the subject property. Stormwater Management Facilities that are constructed on public land, within public rights-of-way, and/or within public easements shall be maintained by the public body with ownership/jurisdiction. The following requirements shall be met for all stormwater management facilities that are constructed on privately-owned property and not within a public easement.

a) Maintenance Easement

Prior to the issuance of any permit that has a stormwater management facility as one of the requirements of the permit, the applicant or owner of the site must execute a maintenance easement agreement that shall be binding on all subsequent owners of land served by the stormwater management facility. The agreement shall provide for access to the facility at reasonable times for periodic inspection by the City, or its contractor or agent, and for regular or special assessments of property owners to ensure that the facility is maintained in proper working condition to meet design standards and any other provisions established by this Section. The property owner shall record such easement, in a form and format approved by the City Attorney, in the City Land Records with the City Clerk's Office.

b) Maintenance Covenants

Maintenance of all stormwater management facilities shall be ensured through the creation of a formal maintenance covenant in a form and format approved by the City Attorney, in the City Land Records with the City Clerk's Office. This covenant shall be entitled, "Stormwater Operations and Maintenance Plan." A schedule for maintenance and inspections shall be included as part of the covenant. The owner, or the owner's assigns, are responsible for maintenance of stormwater management facilities; however, the City may, under certain circumstances, accept dedication of existing or future stormwater management facilities for public maintenance and inspection.

c) Requirements for Maintenance Covenants

All stormwater management facilities must be inspected by the responsible party, in accordance with the approved schedule in the Stormwater Operations and Maintenance Plan, to identify maintenance and repair needs, and to ensure compliance with the requirements of this ordinance. Any identified maintenance and/or repair needs found must be promptly addressed by the responsible party. The inspection and

maintenance requirement may be increased as deemed necessary by the City to ensure proper functioning of the stormwater management facility.

d) Records of Installation and Maintenance Activities

Parties responsible for the inspection, operation, and maintenance of a stormwater management facility shall make records of the installation and of all maintenance and repairs and shall retain the records for at least 5 years. These records shall be made available to the City Engineer upon request and/or as specifically outlined in the maintenance covenant.

e) Failure to Maintain Practices

If a responsible party fails or refuses to meet the requirements of the maintenance covenant, the City, after reasonable notice, may correct a violation of the design standards or maintenance needs by performing all necessary work to place the facility in proper working condition. In the event that the stormwater management facility becomes a danger to public safety or public health, or is otherwise not functioning as designed, the City shall notify the party responsible for maintenance of the stormwater management facility in writing. Upon receipt of that notice, the responsible person shall have thirty (30) days to effect maintenance and repair of the facility in an approved manner. After proper notice, the City may assess the owner(s) of the facility for the cost of repair work and any penalties; and the cost of the work shall be a lien on the property, or prorated against the beneficial users of the property, and may be placed on the tax bill and collected as ordinary taxes by the City.

6.) Inspection:

a) Inspection of Stormwater Facilities

Inspections shall be conducted as prescribed by the Stormwater Operations Maintenance Plan covenant. Additional inspections may be conducted by the City on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other contaminants or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of contaminants or pollutants or with discharges of a type that are more likely than the typical discharge to cause violations of State or Federal water or sediment quality standards or the National Pollutant Discharge Elimination System (NPDES) stormwater permit; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other stormwater treatment practices.

b) Right-of-Entry for Inspection

When any new drainage control facility is installed on private property, or when any new connection is made between private property and a public drainage control system the property owner shall grant to the City the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection. This includes the right to enter a property when the City has a reasonable basis to believe that a violation of this ordinance is occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of a violation of this ordinance.

Erosion Control and Stormwater Management Standards – Projects Not Subject to Major Impact Review

1.) Application Submittal Requirements for Erosion Control & Stormwater Management:

Unless otherwise exempted by this Article, every zoning permit application not subject to Major Impact review and involving a 400 square foot or more increase in impervious surface or amount of disturbed area must be accompanied by an erosion control and stormwater runoff plan. Information requirements may be adjusted or waived by the City Engineer for a particular development application upon written request of the applicant, provided that at least one of the following circumstances can be demonstrated:

- a) Alternative measures for on-site and/or off-site management of stormwater have been proposed, and these measures comply with local ordinance(s).
- b) It is otherwise demonstrated that the proposed development will not produce any significant change to the existing pre-application hydrology.

The erosion control and stormwater runoff plan shall include, at a minimum, the following items depicted on a site plan:

- a) Indication of disturbance limits and the protection of existing vegetation that is to be preserved;
- b) Clearing and grading limits that do not exceed maximum lot coverage at any one time;
- c) Diverting the flow of runoff and melt water away from cleared and graded areas;
- d) Temporary and permanent stabilization of the site; and
- e) The protection of any channels that may become enlarged or destabilized from erosion.

2.) General Performance Criteria for Erosion Control & Stormwater Management:

The following are required stormwater management performance criteria:

- a) All earthen material associated with, or disturbed by, the project shall be retained on the subject property.
- b) Bare earthen material shall immediately be stabilized with erosion control netting and/or with seed and mulch to establish vegetative cover.
- c) The rate and volume of stormwater runoff post-construction shall not exceed the pre-construction rate or volume.
- d) Land disturbance within the stream channel of any ephemeral stream shall be minimized.
- e) Applicants shall utilize Integrated Management Practices/Best Management Practices on an ongoing basis.

3.) Maintenance:

Stormwater management facilities that are constructed on privately-owned land and that are not within a public easement shall be maintained by the owner of the subject property. Stormwater Management Facilities that are constructed on public land, within public rights-of-way, and/or within public easements shall be maintained by the public body with ownership/jurisdiction. In all cases, stormwater facilities shall be kept in working order and shall be inspected and maintained at least annually.

APPENDIX E – NATURAL RESOURCE PROTECTION OVERLAY DISTRICT
Sec. 4.5.4 Natural Resource Protection Overlay (NR)
District

(A) Purpose and Authority

The Natural Resource Protection Overlay District is intended to:

Protect surface waters and wetlands from encroachment by development, and from sources of non-point pollution;

Protect the functions and values of Burlington’s wetlands;

Protect and enhance water quality near public beaches and other water-based recreation areas from sources of non-point pollution;

Preserve natural features and communities, geologic features and cultural sites for education and research.

Provide opportunities for public access where feasible and appropriate;

Facilitate connections and corridors for wildlife between areas of publicly protected sites.

Ensure that development that occurs within a Flood Hazard Area conforms to the requirements of the National Flood Insurance Program.

These regulations are enacted under provisions of 24V.S.A. Sections 4405, 4407, 4412, and 4417.

(B) Areas Affected

This overlay district includes all areas delineated on Map 4.5.4 A-Natural Resources Protection Overlay (NR) District and is divided into four (4) subparts:

1. A **Riparian and Littoral Conservation Zone** which consists of all surface water and a corresponding buffer area which is equally divided into an inner and an outer buffer except as otherwise noted, and specifically includes the following areas:

a. Within 250 feet of the Lake Champlain shoreline with the exception of that portion of the shoreline between the northern property line of the former Moran Generating Station and the most westerly extent of Roundhouse Point described as the “Urban Waterfront” in the *2000 Open Space Protection Plan*;

b. Within 250 feet of the Winooski River shoreline;

c. Within 100 feet of the Engelsby, Potash or Centennial Brook shoreline; and,

d. Within 50 feet of the shoreline of all other areas inundated by water including rivers and streams, lakes and ponds;

2. A **Wetland Conservation Zone** which consists of all wetlands and a corresponding buffer area which is equally divided into an inner and an outer buffer except as otherwise noted, and specifically includes the following areas:

a. Within 100 feet of all VT Class 1 and 2 wetlands except in cases where the State of Vermont has established a greater buffer zone width; and.

b. Within 100 feet from all vernal pools.

3. A **Natural Areas Zone** which consists of all areas identified as Significant Natural Areas in the City's *Open Space Protection Plan* and a corresponding buffer area of 100 feet which is equally divided into an inner and an outer buffer except as otherwise noted.

4. A **Flood Hazard Zone** as defined and delineated by the Federal Emergency Management Agency for the purposes of administering the National Flood Insurance Program.

(C) District Specific Regulations: Riparian and Littoral Conservation Zone

1. Permitted Uses: Inner and Outer Buffer

Except where otherwise noted herein, only the following uses are permitted within the inner and outer buffer subject to the requirements and limitations set forth below under subpart 4.

Normal maintenance of existing lawns and maintained grounds including mowing, trimming of vegetation and the removal of dead or diseased vegetation around a residence, decorative landscaping and planting, vegetable and flower gardens, and the repair of existing private landscaping structures such as walkways and walls.

Application of pesticides performed by an applicator certified by the Vermont Department of Agriculture for the sole purpose of controlling invasive species and subject to the requirements of the City's pesticide application ordinance (Burlington Code of Ordinances, Chapter 17, Section 9). In no other cases shall pesticides be applied.

“Accepted agricultural practices” as defined under 24 VSA Ch 117;

Normal maintenance of constructed wetlands and stormwater systems, provided that naturally occurring wetlands are not disturbed in conjunction with the maintenance;

Stormwater outfall as part of a stormwater management plan approved by the city engineer. In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater and control erosion and sedimentation and the city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules.

Normal maintenance of existing docks, roads, rail lines, bridges, and culverts provided that disturbance to any shoreland is minimized in conjunction with such maintenance;

Selective cutting of less than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle; and,

Recreational and educational activities such as hiking, walking, fishing, nature study, and bird watching and associated boardwalks and unimproved trails.

2. Prohibited Uses: Inner Buffer

Except where noted herein, the following uses shall be prohibited within the inner buffer.

Any land disturbing activities (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) not associated with a permitted or conditionally permitted use.

The deposition or introduction of organic and inorganic chemicals, including herbicides and pesticides,

The off-road use of any motorized vehicles including ATVs or dirt bikes (the temporary use of motorized vehicles used to construct and maintain permitted or regulated activities are specifically exempted from this prohibition);

The construction of buildings or other structures, and roads, parking areas or any other impervious surface.

3. Conditional Uses: Outer Buffer

Except where otherwise noted herein, all uses permitted or conditionally permitted in the respective underlying zoning district may be approved only within the outer buffer after review and approval pursuant to the Conditional Use review provisions of Article 3 and subject to the requirements and limitations below under subpart 4.

4. Requirements

(a) Land disturbing activities which expose more than 5,000 or more square feet of soil (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) where a stormwater management, erosion prevention and sediment control plan has been reviewed by the Burlington Conservation Board and approved by the city engineer.

(b) Agricultural activities shall follow the Secretary of Agriculture's Best Management Practices for the Protection of Water Quality.

(c) Installation of any seawalls, rip-rap or other shoreland retention structures shall be submitted for review by the Burlington Conservation Board who shall consult with the city engineer prior to issuance of a recommendation to the development review board.

(d) No new stormwater outfall shall directly discharge into surface water without approval and implementation of a stormwater management plan approved by the city engineer.

(e) Stormwater management, erosion prevention, and sedimentation control plans shall be submitted for review by the Burlington Conservation Board who shall consult with the development review board and city engineer prior to issuance of a recommendation to the city engineer who shall render a final decision on such plans.

(f) In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater and control erosion and sedimentation and the city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules.

(D) District Specific Regulations: Wetland Conservation Zone

1. Additional Application Requirements

The following information shall be submitted in addition to the applicable requirements of Article 3 for development involving site that include wetlands:

(a) Boundary Determination: The boundaries of a wetland shall be determined in the field by a qualified professional with expertise in wetland delineation and surveyed by a licensed land surveyor or other qualified individual. The boundary between wetland and upland shall be delineated by the methodology set forth in the 1987 edition of the Federal Manual for Identifying and Delineating Jurisdictional Wetlands. The identification and delineation of wetlands for a proposed project must be performed within the five-year period prior to submission and acceptance of a complete zoning application.

(b) A report addressing the project's impact on the significant wetland functions and values, and the measures that the applicant has incorporated into the project to avoid and minimize wetland impacts shall be prepared by a qualified professional with expertise in wetland delineation and evaluation.

(c) A site plan for a project that will impact a wetland or buffer zone shall include delineated wetland boundaries, buffer zone boundaries, erosion control measures, and all components of the proposed project, including, but not limited to all structures, driveways, parking areas, lawns, utilities, and the overall footprint of the construction area/zone of disturbance.

(d) As part of their zoning permit application, applicants must submit a complete stormwater management, erosion prevention and sediment control plan and successfully demonstrate how the project manager will prevent adverse impacts to surface water and groundwater quality before, during, or after construction. At a minimum, an applicant should demonstrate how a project will meet the standards outlined in the latest edition of the Vermont Soil Erosion Handbook.

2. Permitted, Regulated, and Prohibited Uses:

(a) Permitted Uses: Wetland or Wetland Buffer:

Except where otherwise noted herein, only the following uses are permitted within a wetland and its buffer zone subject to the requirements and limitations set forth below under subpart e.

Normal maintenance of existing lawns and maintained grounds including mowing, trimming of vegetation and the removal of dead or diseased vegetation around a residence, decorative landscaping and planting, vegetable and flower gardens, and the repair of existing private landscaping structures such as walkways and walls.

Application of pesticides performed by an applicator certified by the Vermont Department of Agriculture for the sole purpose of controlling invasive species and subject to the requirements of the City's pesticide application ordinance (Burlington Code of Ordinances, Chapter 17, Section 9). In no other cases shall pesticides be applied.

“Accepted agricultural practices” as defined under 24 VSA Ch 117.

Normal maintenance of constructed wetlands and stormwater systems, provided that naturally occurring wetlands are not disturbed in conjunction with the maintenance;

Stormwater outfall as part of a stormwater management plan approved by the city engineer. In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater and control erosion and sedimentation and the city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules.

Normal maintenance of existing roads, rail lines, bridges, and culverts provided that disturbance to naturally occurring wetlands and shorelands is minimized in conjunction with such maintenance;

Selective cutting of less than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle;

Recreational and educational activities such as fishing, walking, hiking, nature study, and bird watching.

(b) Prohibited Uses: Wetland and Inner Buffer

Except where noted herein, the following uses shall be prohibited within the inner buffer. Land disturbing activities (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) not associated with a permitted or conditionally permitted use.

The deposition or introduction of organic and inorganic chemicals, including pesticides,

The off-road use of any motorized vehicles including ATVs or dirt bikes (the temporary use of motorized construction vehicles used to construct permitted or regulated activities in the wetland are specifically exempted from this prohibition) ;

The construction of buildings or other structures, and roads, parking areas or other impervious surface.

(c) Conditional Uses: Outer Buffer

Except where noted herein, all uses permitted or conditionally permitted in the respective underlying zoning district, including the list of activities below, may be approved within the outer buffer after review and approval pursuant to the Conditional Use Review provisions of Article 3 and subject to the requirements and limitations set forth below under subpart 3 below.

Any land disturbing activities which expose 5,000 or more square feet of soil (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) where a stormwater management, erosion prevention and sediment control plan has been reviewed by the Burlington Conservation Board and approved by the city engineer.

Any form of drainage, dredging, excavation, or removal of material either directly or indirectly;

Alteration or modification of natural drainage patterns, natural features and contours;

Installation of docks, rip-rap or other shoreline stabilization features

Installation of utility poles or utility service lines, underground pipes or cable conduits, and wells;

Cutting of greater than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle

Construction, expansion or placement of any structure;

Construction or expansion of existing roads, rail lines parking areas, trails, and sidewalks;

Introduction of any form of pollution, including but not limited to the installation of a septic tank, the running of a sewer outfall, or the discharge of sewage treatment effluent or other liquid wastes into or so as to drain into a wetland;

(d) Prohibited activities in a vernal pool and buffer zone:

Except where noted herein, the following uses shall be prohibited within a vernal pool and its respective buffer.

Any activities which disturb the area within 100 feet of a vernal pool, including, but not limited to timber harvesting, disturbance of the understory vegetation, pesticide or herbicide application, the erection of fences or other barriers to amphibian dispersal, barriers and any other type of human activities that disturb the vegetation or water quality in the pool and buffer.

3. Criteria for Review

In granting, denying, or conditioning any permit, the DRB, in consultation with the Conservation Board, will consider the significant functions and values of the wetland, the project's impact on the significant functions and values, and the measures that the applicant has incorporated into the project to avoid and minimize wetland impacts. The DRB shall only approve a project having an impact on a wetland or wetland buffer zone if an applicant can demonstrate that any adverse impact is de minimus on the significant functions and values of the wetland including:

Water storage for floodwater and stormwater;

Erosion and sedimentation control through binding and stabilizing the soil or shoreline;

Surface water and groundwater protection, including sediment and toxicant retention, nutrient retention and transformation, and groundwater discharge and recharge;

Fisheries habitat;

Wildlife habitat;

Examples of natural community types that are exemplary, rare, or make an important contribution to the natural heritage of Burlington and Vermont;

Habitat for rare, threatened and endangered species;

Education and research in natural sciences;

Recreational and economic benefits; and,

Open space and aesthetics.

In addition, the review of a project having involving a wetland or wetland buffer zone shall also be subject to the following requirements and limitations:

No new stormwater outfall shall directly discharge into surface water without approval and implementation of a stormwater management plan approved by the city engineer.

No installation of docks, rip-rap or other shoreline stabilization features shall be installed without review approval by the city engineer.

Agricultural activities shall follow the Secretary of Agriculture's Best Management Practices for the Protection of Water Quality.

Stormwater management, erosion, and sedimentation control plans shall be submitted for review by the Burlington Conservation Board who shall consult with the development review board and city engineer prior to issuance of a recommendation to the city engineer who shall render a final decision on such plans.

In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater and control erosion and sedimentation and the city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules.

(E) District Specific Regulations: Natural Areas Zone

1. Additional Application Requirements

The following information shall be submitted in addition to the applicable requirements of Article 3 for development involving site that include wetlands:

- (a) The boundaries of a Natural Area shall be determined in the field by a qualified professional field naturalist with expertise in feature delineation and surveyed by a licensed land surveyor or other qualified individual. The identification and delineation must be performed within the five-year period prior to submission and acceptance of a complete zoning application.
- (b) A report shall be prepared addressing the proposed project's impact on the natural areas functions and values, and the measures that the applicant has incorporated into the project to avoid and minimize impacts.
- (c) A site plan that shall include delineated Natural Area boundaries and the associated buffer zone with respect to the overall footprint of the construction area/zone of disturbance.

2. Permitted, Regulated, and Prohibited Uses:

- (a) Permitted Uses: Natural Area and Buffer:

Except where otherwise noted herein, only the following uses are permitted within a natural area and its buffer zone subject to the requirements and limitations set forth below under subpart 3.

Normal maintenance of constructed wetlands and stormwater systems, provided that naturally occurring wetlands are not disturbed in conjunction with the maintenance;

Normal maintenance of existing roads, bridges, and culverts provided that disturbance to naturally occurring wetlands and shorelands is minimized in conjunction with such maintenance;

Selective cutting of less than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle;

Recreational and educational activities such as fishing, walking, hiking, nature study, and bird watching.

(b) Prohibited Uses: Natural Area and Buffer

Except where noted herein, the following uses shall be prohibited within the inner buffer.

Land disturbing activities (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) not associated with a permitted or conditionally permitted use.

The deposition or introduction of organic and inorganic chemicals, including pesticides,

The off-road use of any motorized vehicles including ATVs or dirt bikes (the temporary use of motorized construction vehicles used to construct permitted or regulated activities in the wetland are specifically exempted from this prohibition) ;

The construction of buildings or other structures, and roads, parking areas and any other impervious surfaces.

(c) Conditional Uses: Outer Buffer

Except where noted herein, all uses permitted or conditionally permitted in the respective underlying zoning district, including the list of activities below, may be approved within the outer buffer after review and approval pursuant to the Conditional Use provisions of Article 3 and subject to the requirements and limitations set forth below under subpart 3.

Land disturbing activities which expose 5,000 or more square feet of soil (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) are prohibited except where a stormwater management, erosion prevention and sediment control plan has been reviewed by the Burlington Conservation Board and approved by the city engineer.

Any form of drainage, dredging, excavation, or removal of material either directly or indirectly;

Alteration or modification of natural drainage patterns, natural features and contours;

Installation of docks, rip-rap or other shoreline stabilization features

Installation of utility poles or utility service lines, underground pipes or cable conduits, and wells;

Cutting of greater than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle

Construction, expansion or placement of any structure;

Construction or expansion of existing roads, parking areas, trails, and sidewalks;

Introduction of any form of pollution, including but not limited to the installation of a septic tank, the running of a sewer outfall, or the discharge of sewage treatment effluent or other liquid wastes into or so as to drain into a wetland;

Agricultural activities following the Secretary of Agriculture's Best Management Practices for the Protection of Water Quality including but not limited to housing of livestock, manure storage, pasturing livestock, growing crops, and compost storage, but excluding residential backyard compost storage

3. Criteria for Review

In granting, denying, or conditioning any permit, the DRB, in consultation with the Conservation Board, will consider the significant functions and values of the natural area, the project's impact on the significant functions and values, and the measures that the applicant has incorporated into the project to avoid and minimize impacts. The DRB shall only approve a project having an impact on a wetland or wetland buffer zone if an applicant can demonstrate that any adverse impact is de minimus on the significant functions and values of the natural area including:

Water storage for floodwater and stormwater;

Erosion and sedimentation control through binding and stabilizing the soil or shoreline;

Surface water and groundwater protection, including sediment and toxicant retention, nutrient retention and transformation, and groundwater discharge and recharge;

Fisheries habitat;

Wildlife habitat;

Examples of natural community types that are exemplary, rare, or make an important contribution to the natural heritage of Burlington and Vermont;

Habitat for rare, threatened and endangered species;

Education and research in natural sciences;

Recreational and economic benefits; and,

Open space and aesthetics.

(F) District Specific Regulations: Flood Hazard Area

1. Permitted Uses-FW and FH Districts

The following open land uses shall be permitted within the floodway (FW) and flood hazard (FH) district to the extent that they are not prohibited by any other ordinance and provided that they do not require the erection of structures or storage of materials and equipment, the borrowing of fill from outside the floodway area, or channel modification or relocation, and do not obstruct flood flows, nor result in any increase in flood levels during the occurrence of the base flood discharge, decrease the water-carrying capacity of the floodway or channel, or increase off-site flood damage potential:

(a) Agricultural uses, such as general farming, pasture, orchard, and grazing, outdoor plant nurseries, truck farming, and forestry;

(b) Recreation uses, such as parks, camps, picnic grounds, tennis courts, golf courses, golf driving ranges, archery and shooting ranges, hiking and riding trails, hunting and fishing areas, game farms, fish hatcheries, wildlife sanctuaries, nature preserves, swimming areas and boat launching sites; and/or

(c) Accessory residential uses, such as lawns, gardens, and parking areas. Among the uses not permitted are junkyards, mobile homes, and storage facilities for chemicals, explosives, flammable liquids or other toxic materials.

2. Permitted Accessory Uses.

Uses customarily accessory and incidental to any of the permitted uses listed in underlying zoning district may be permitted, subject to the limitations therein.

3. Conditional Uses - FH District.

All uses permitted in the underlying zoning district, except those permitted open space uses as listed in Section 4.5.4.G.1 above, are permitted only upon the granting of a conditional use by the development review board as per Article 3.

Upon receiving an application for a conditional use permit, the development review board shall, prior to holding a hearing and rendering a decision thereon, obtain from the applicant:

(a) Base flood elevation data for all subdivision proposals and other proposed new developments containing more than fifty (50) lots or covering more than five (5) acres;

(b) The elevation, in relation to mean sea level, of the lowest habitable floor, including basement, of all new construction or substantial improvements of structures;

(c) Confirmation if such structures contain a basement; and

(d) The elevation, in relation to mean sea level, to which any structure has been flood proofed. In addition, the development review board shall require of the applicant any of the following information deemed necessary for determining the suitability of the particular site for the proposed use:

(e) Plans in triplicate, drawn to scale, showing the location, dimensions, contours and elevation of the lot; the size and location on the site of existing and/or proposed structures, fill or storage of materials; the location and elevations of streets, water supply and sanitary facilities; and the relationship of the above to the location of the channel, floodway and base flood elevation where such information is available;

(f) A typical valley cross-section showing the channel of the stream, elevation of land areas adjoining each side of the channel and cross-sectional areas to be occupied by the proposed development;

(g) A profile showing the slope of the bottom of the channel or flow line of the stream; and

(h) Specifications for building construction and materials, flood proofing, mining, dredging, filling, grading, paving, excavation or drilling, channel improvement, storage of materials, water supply and sanitary facilities.

4. Mandatory Notification

The development review board shall transmit one copy of the application and supporting information to the Department of Environmental Conservation in accordance with 24 V.S.A. section 4409 (c)(2)(A). In riverine situations, the development review board shall notify adjacent communities and the Agency of Natural Resources prior to approval of any alteration or relocation of a watercourse and submit copies of such notifications to the FIA Administrator.

5. Evaluation

In reviewing the application, the development review board shall consider the evaluation of the Department of Environmental Conservation and shall determine that the proposed use will conform to the development standards of subpart 7 below.

6. 30-Day Time Limit

No permit may be granted for new construction substantial improvement, filling, installation of a residential structure or the development of land in any area designated as a floodplain by the Department of Environmental Conservation prior to the expiration of a period of thirty (30) days following the submission of the application and a report describing the proposed use, the location requested and an evaluation of the effect of such proposed use on Burlington's municipal development plan and the regional plan, if any, to the Department of Environmental Conservation provided this subsection shall not be applicable to public utility generating stations and transmission lines which shall require the issuance of a certificate of public good under 30 V.S.A. 248 prior to any land filling or construction.

7. Special Review Criteria:

In reviewing each application, the development review board shall assure that the flood-carrying capacity within any portion of an altered or relocated watercourse is maintained and shall consider:

- (a) The danger to life and property due to increased flood heights or velocities caused by encroachments;
- (b) The danger that material may be swept on to other lands or down stream to the injury of others;
- (c) The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination and unsanitary conditions;
- (d) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;
- (e) The importance of the services provided by the proposed facility to the community;
- (f) The availability of alternative locations not subject to flooding for the proposed use;
- (g) The compatibility of the proposed use with existing development and development anticipated in the foreseeable future;
- (h) The relationship of the proposed use to the municipal development plan;

- (i) The safety of access to the property in times of flood of ordinary and emergency vehicles;
- (j) The expected heights, velocity, duration, rate of rise, and sediment transport of the floodwaters expected at the site; and
- (k) Such other factors as are relevant to the purposes of this ordinance.

8. Approval Conditions:

Upon consideration of those factors in subpart 7 above and the purposes of these regulations, the development review board shall attach the following conditions to any permit it chooses to grant. Such conditions require that:

- (a) All residential structures have the first floor, including basement, elevated at least at or above, the base floods elevation;
- (b) All development shall be designed to minimize flood damage to the proposed development and to public facilities and utilities;
- (c) All new construction and substantial improvements for nonresidential purposes shall have the lowest floor, including basements, elevated at or above the base flood elevation or be designed to be watertight below the base flood elevation, with walls substantially impermeable and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A permit for a proposed building shall not be issued until a registered architect or engineer has reviewed the structural design, specifications and plans and has certified that the design and methods of construction are in accordance with meeting the provisions of this subsection;
- (d) Structures shall be:
 - (i) Designed and anchored to resist flotation, collapse, or lateral movement during the occurrence of the base flood;
 - (ii) Constructed of materials resistant to flood damage;
 - (iii) Constructed by methods and practices that minimize flood damage; and
 - (iv) Constructed with electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;
- (e) All development shall be designed to provide adequate surface drainage to reduce exposure to flood hazards;
- (f) Any fill shall be prohibited that will cause any increase in the base flood level;
- (g) The flood-carrying capacity within any altered or relocated portion of a watercourse shall be maintained;
- (h) New and replacement water supply and sanitary sewer systems shall be designed so as to prevent the infiltration of floodwaters into the systems and discharge from the systems;
- (i) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding;

(j) New and replacement manufactured homes shall be elevated on properly compacted fill such that the top of the fill (the pad) under the entire manufactured home will be above the base flood elevation;

(k) All necessary permits be obtained from those governmental agencies from which approval is required by federal or state law; and

(l) All new construction and substantial improvements that have fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access or storage shall have permanent openings, designed to allow the entry and exit of flood waters in accordance with specifications of 60.3(c)(5) of National Flood Insurance Program (NFIP) Rules and Regulations.

(m) As prescribed by the district in which the FH is overlaid and as set forth in Articles 5 and 10.

(n) As prescribed by the district in which the FH is overlaid and as set forth in Articles 6 and 7.

9. Records.

The administrative officer shall maintain a record of:

(a) The elevation, in relation to mean sea level, of the lowest habitable floor, including basement, of all new or substantially improved structures, and whether or not such structures contain a basement; and

(b) The elevations, in relation to mean sea level, to which existing structures have been flood-proofed.

10. Variances.

(a) Review Criteria.

The development review board, after public hearing, may approve the repair, relocation, replacement or enlargement of a non-complying structure within a regulated flood hazard area, subject to compliance with applicable federal laws and regulations and provided that the following criteria are met:

- i. The board finds that the repair, relocation, or enlargement of the non-complying structure is required for the continued economically feasible operation of a nonresidential enterprise;
- ii. The board finds that the repair, relocation, or enlargement of the non-complying structure will not increase flood levels in the regulatory floodway, threaten the health, safety, and welfare of the public or other property owners; and,
- iii. The permit so granted states that the repaired, relocated, or enlarged non-complying structure is located in a regulated flood hazard area, does not conform to the bylaws pertaining thereto, and will be maintained at the risk of the owner.

A copy of such a permit granted by the board shall be affixed to the copy of the deed of the concerned property on file in the City Clerk's office.

(b) Notice to Applicant.

The development review board shall notify the applicant that:

- i. The issuance of a variance to construct a structure below the base flood elevation will result in increased premium rates for flood insurance up to amounts as high as twenty-five dollars (\$25.00) for one hundred dollars (\$100.00) of insurance coverage; and
- ii. Such construction below the base flood elevation increases risks of life and property.

(c) Annual Recording.

The development review board shall:

- i. Maintain a record of all variance actions, including justification for their issuance; and
- ii. Report such variances issued in its annual report to the administrative officer.

11. Warning of Disclaimer of Liability.

These regulations do not imply those areas outside the flood hazard area or land uses permitted within such districts will be free from flooding or flood damages. These regulations shall not create liability on the part of any city official or employee thereof for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made there under.

APPENDIX F – ENGLSBY BROOK STORMWATER TREATMENT SYSTEMS



O8 Pond Forebay



O8 Main Pond (Note Champlain School in Background)



SM6 Shallow Marsh Forebay



SM6 Shallow Marsh Wetland Cell 1



SM6 Shallow Marsh Wetland Cell 2



Englesby Stream Channel Restoration