Colchester
VERMONT

781 Blakely Road • Colchester, Vermont • 05446 • 802.264.5500

www.colchestervt.gov

March 23, 2020

Christy Witters
Vt. Department of Environmental Conservation
Watershed Management Division
1 National Life Drive, Main 2
Montpelier, Vermont 05620-3522

Dear Ms. Witters:

Attached is the Town of Colchester's 2019 MS4 Annual Report. Included in this application are the following documents:

- 2019 Annual Report Form
- MS4 NOI Form w/ REI Information
- Annual Report Workbook
- BMP Tracking Table
- Attachments supporting our Annual Reporting Workbook
- Permit Incorporation Form
- Colchester's SWMP – Please note that this has been amended (see page 19) to include Appendix I – Materials Handling Procedure

Please give me a call at 264-5620 if you require any additional information or have any questions.

Sincerely,

Bryan K. Osborne
Director of Public Works
Colchester

Digitally signed by Bryan K. Osborne
DN: cn=Bryan K. Osborne, o=Department of Public Works, ou=Town of Colchester, email=bosborne@colchestervt.gov, c=US
Date: 2020.03.24 08:52:42 -04'00'

Bryan K. Osborne
Director of Public Works
E: bosborne@colchestervt.gov
P: 802.264.5620 | F: 802.264.5503

2019 Annual Report Form

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
STORMWATER PROGRAM

Municipal Separate Storm Sewer System (MS4)
2019 Annual Report

A. Permittee Information

1. Name of MS4: Colchester

2. Permit Number: 7023 - 9014

B. Attached Documents

The following documents have been prepared and submitted with this Annual Report:

- [x] Annual Report Workbook (.xlsx)
- [x] BMP Tracking Table (.xlsx)

C. Certification of STPs constructed to comply with the FRP or PCP

The following BMPs were built or implemented within the past calendar year and were constructed in compliance with the approved Flow Restoration Plan (FRP) or Phosphorus Control Plan (PCP).

Name of System	Location

Name of Qualified Designer

Title

Signature

Date

D. MS4 Operator Certification

This Annual Report shall be signed by a principal executive officer, ranking elected official or other duly authorized employee consistent with 40 CFR §122.22(b) and certified as follows:

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 gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted 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.

Aaron Frank

Print Name

Town Manager

Title

Aaron Frank

Signature

3/24/2020

Date

Revised February 2020

MS4 NOI Form w/ REI Information

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
STORMWATER PROGRAM

Road Erosion Inventory (REI) Submittal

Notice of Intent (NOI) for Stormwater Discharges from Municipal Separate Store Sewer Systems (MS4) General Permit 3-9014

Submission of this Notice of Intent (NOI) constitutes notice that the entity in Section A intends to be authorized to discharge pollutants to waters of the State under Vermont's Municipal Separate Storm Sewer Systems (MS4) permit. Submission of the NOI also constitutes notice that the party identified in Section A of this form has read, understands and meets the eligibility conditions; agrees to comply with all applicable terms and conditions; and understands that continued authorization under the MS4 General Permit is contingent on maintaining eligibility for coverage. In order to be granted coverage, all information required on this form and a complete Stormwater Management Program (SWMP) Plan must be submitted.

A. Permittee Information

1. Name of MS4: Colchester		
2a. Name of Principle Executive Officer (PEO) or Chief Elected Official (CEO): Aaron Frank		
2b. Title: Town Manager		
3a. Mailing Address: 781 Blakely Road		
3b. Town: Colchester	3c. State: Vermont	3d. Zip: 05446
4. Phone: 802-264-5509	5. Email: afrank@colchestervt.gov	

B. Primary contact responsible for overall coordination of SWMP, if different than PEO/CEO

1. Name: Bryan Osborne		
2a. Mailing Address: 781 Blakely Rd		
2b. Town: Colchester	2c. State: VT	2d. Zip: 05446
3. Phone: 802-264-5620	4. Email: bosborne@colchestervt.gov	
5. Additional Contact Name:		
6. Additional Contact Email:		

C. Partnering organization responsible for Minimum Control Measure implementation (if applicable)

1. If you are participating in the CCRPC MOU to implement MCM1 &/or MCM2 check here: ✔ MCM 1 ✔ MCM 2

Or, if you are relying on another entity to implement a MCM, please complete the following:

2. Organization:		
3. Contact Name:		
4. Minimum Control Measure(s) being implemented:		
5a. Mailing Address		
5b. Town:	5c. State:	5d. Zip:
6. Phone:	7. Email:	

D. Incorporation of Previously Permitted Stormwater Systems

1a. As part of this application, is the MS4 incorporating a stormwater system that was previously authorized under a State stormwater permit? ○ Yes ◉ No

1b. If yes, the MS4 must complete and attach the MS4 Incorporation Form.

List permit numbers here: _____

E. Road Erosion Inventory Submittal

Has a Road Erosion Inventory (REI) been completed and uploaded to the Municipal Roads General Permit (MRGP) Implementation Table Portal?

☑ Yes, Date submitted: 3/2/2020 Entity who complete REI: CCRPC

The results of the Road Erosion Inventory can be viewed at:
https://anrweb.vt.gov/DEC/IWIS/MRGPReportViewer.aspx?ViewParms=True&Report=Portal

F. Stormwater Discharges

1. Identify the names of all know waters that receive a discharge from the MS4 or developed lands subject to this permit:

Receiving water	# of outfalls (if known)	Impaired status	Nature of impairment	Response Plan developed (select from the drop down list)
Sunderland Brook	42	○ No ◉ Yes	Stormwater, Chloride	FRP - Flow Restoration Plan
Indian Brook	4	◉ No ○ Yes		N/A
Pond Brook	3	◉ No ○ Yes		N/A
Gilbrook	3	◉ No ○ Yes		N/A
Morehouse Brook	2	○ No ◉ Yes	Stormwater	FRP - Flow Restoration Plan
Smith Brook	6	◉ No ○ Yes		N/A
Winooski River (Direct)	15	◉ No ○ Yes		N/A
Winooski River (Tribs)	3	◉ No ○ Yes		N/A
Lake Champlain (including Malletts Bay)	17	○ No ◉ Yes	Phosphorus	PCP - Phosphorus Control Plan
Malletts Bay tributaries	5	○ No ◉ Yes	E. Coli	N/A
		○ No ○ Yes		N/A
		○ No ○ Yes		N/A

G. Certification

This NOI shall be signed by a principal executive officer, ranking elected official or other duly authorized employee consistent with 40 CFR §122.22(b) and certified as follows:

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 gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted 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.

Aaron Frank
Print Name

Aaron Frank
Signature

Town Manager
Title

3/24/2020
Date

Submit this form and applicable attachments to: MS4 Permit Coordinator
VTDEC · Stormwater Management Program
1 National Life Drive, Davis 3
Montpelier, Vermont 05620-3522

Attachments supporting our Annual Reporting Workbook

MS4 Annual Report Attachments – MM1

- MOU with Chittenden County Regional Planning Commission Documenting our participation in regional stormwater education strategy
- Invoice Documenting funding support for Rethink Runoff
- Stormwater Utility Spring 2019 Newsletter
- Stormwater Utility Fall 2019 Newsletter
- 2019 Rethink Runoff Annual Report for MCM#1 Regional Stormwater Education Program

CHITTENDEN COUNTY MS4
STORMWATER PROGRAM AGREEMENT
EFFECTIVE July 1, 2017

Preamble

This Stormwater Program Agreement ("Agreement") is entered into by and between a group of Municipal Separate Storm Sewer System ("MS4") permittees ("MS4 Permittees") and the Chittenden County Regional Planning Commission ("CCRPC") to operate an MS4 Stormwater Program ("Program") that conforms with and satisfies the relevant requirements of both Minimum Control Measure One (Public Outreach and Education) and Minimum Control Measure Two (Public Involvement and Participation) of the Phase II NPDES Permit issued by the Vermont Department of Environmental Conservation ("DEC") on December 2012 through General Permit 3-9014 ("MS4 Permit"), as these requirements may be continued, renewed, amended, or otherwise modified during the term of this Agreement.

1. Prior Agreements – Effective July 1, 2017, this Agreement

   a. supersedes an MOU signed by the CCRPC and twelve MS4 permittees, effective March 10, 2013 through March 9, 2018, governing the operation of a Regional Stormwater Education Program to satisfy the relevant requirements of Minimum Control Measure One (Public Outreach and Education), and

   b. supersedes an MOU signed by the CCRPC and eleven MS4 permittees, effective July 1, 2011 through June 30, 2016, and an amendment to this MOU extending its effective date through June 30, 2017, governing the operation of a Regional Stormwater Public Involvement and Participation Program to satisfy the relevant requirements of Minimum Control Measure Two (Public Involvement and Participation).

2. Service Agreement – This Agreement constitutes a service agreement pursuant to 24 V.S.A. § 4345b (Intermunicipal Service Agreements).

3. Definitions—For purposes of this Agreement, the term "MS4 Permittees" includes the Vermont Agency of Transportation, which on December 28, 2016 became eligible for coverage under General Permit 3-9007 for Stormwater Discharges from the State Transportation Separate Storm Sewer System (TS4).

4. Parties – The following are the parties to this Agreement:

   a. **MS4 Permittees** – the undersigned MS4 Permittees, and

   b. **CCRPC** – the undersigned regional planning commission.

5. MS4 Steering Committee

   a. **Composition** – The Members of the Steering Committee shall consist of one representative from each of the signatory MS4 Permittees to this Agreement. Another MS4 may request to join this Agreement if approved by a two-thirds vote of the Members. The Members shall be appointed

either by the governing bodies of their municipalities at publicly warned meetings or, if a Member representing an MS4 Permittee is non-municipal agency, via a process consistent with that agency's policies. At its first meeting, the Steering Committee shall elect a Chair by a majority vote. The Chair shall serve until such time as the Chair resigns or the Steering Committee elects a new Chair.

b. **Duties** – The Steering Committee shall direct the CCRPC on the development and performance of Program Services in particular and on all other matters bearing on the administration of this Agreement. All actions of the Steering Committee shall be by majority vote unless otherwise specified in this Agreement.

c. **Organization of Meetings** – The Steering Committee shall meet on a quarterly basis at a minimum. The CCRPC shall provide Steering Committee Members with reasonable notice of meetings. Notice shall include a meeting agenda and draft meeting minutes. In addition, the CCRPC shall post notice of Steering Committee meetings on its website and on the Program website.

6. CCRPC

a. **Duties** – The CCRPC shall:

1) Administer this Agreement and agreements with contractors (including executing contracts approved by the Steering Committee, receiving and disbursing funds, and monitoring the provision of services) for the benefit of the MS4 Permittees.

2) Provide other services contributing to the operation of the Program (including, but not limited to, social media management, public relations, grant writing, creating and managing a Program website, organizing meetings as set forth in Section 4.c, above, etc.) as directed by the Steering Committee; and at a level consistent with each year's Program Budget as described in Section 8.b, below.

3) Provide a quarterly budget report to the Steering Committee detailing expenses the CCRPC incurred and the payments it has received.

4) Pay contractors and vendors for charges consistent with the relevant contract, using funds from the Program Budget, as defined in Section 8, below.

5) Upon approval of the Steering Committee or its designee, reimburse itself for personnel and other expenses for charges consistent with its duties, using funds from the Program Budget.

6) Consult with the Steering Committee prior to authorizing any contractor activities or charges outside the scope of work of a contract.

7) Notify the Steering Committee when 75% of the annual budget (as defined in Section 8, below) for an individual category of expenses (e.g., contractors, CCRPC fees, advertising, etc.) is reached. When these levels are reached, subsequent expenditures by the CCRPC in that category shall be reviewed and approved by the Steering Committee Chair in advance.

8) At the request of the Steering Committee, assign any or all contracts that the CCRPC has entered into pursuant to this Agreement to the MS4 Permittees who are signatories to this Agreement at the time or to another contractor of the Steering Committee's choosing.

9) Comply with all applicable federal, state, and local laws, including Burlington's Livable Wage Ordinance as applicable.

b. **Compensation** – Through the Program Budget, the MS4 Permittees shall compensate the CCRPC for the actual costs of performing its duties defined in Section 5.a, above; provided, however, that the CCRPC shall not be entitled to compensation that would exceed ten percent (10%) of the Program Budget as specified in Section 8.b, below, without the prior approval of a majority of the Steering Committee.

c. **Invoices** – The CCRPC shall invoice the Program to cover personnel charges, mileage reimbursement, and other direct expenses necessary to perform its duties. Personnel charges for CCRPC staff shall be calculated at a rate of salary plus fringe. The CCRPC shall not charge the Program an Indirect Rate. As set forth in Section 5.b, above, upon approval of the Steering Committee or its designee, the CCRPC may reimburse itself for charges consistent with its duties, using funds from the Program Budget.

7. <u>Selection of Contractors</u>

a. The CCRPC, in consultation with the Steering Committee, shall competitively bid for contract(s) for Program services that collectively satisfy the requirements for Minimum Control Measure One (Public Outreach and Education) and Minimum Control Measure Two (Public Involvement and Participation) of the Phase II NPDES Permit then in effect. The parties to the contracts shall be the contractors and the CCRPC. All contracts shall require the contractor to indemnify and hold harmless the MS4 Permittees from any claims related to the contract and to procure and maintain liability insurance for all services performed under the contract.

b. All contracts shall be awarded based on qualifications, price, and the ability of the entity to provide services that meet the relevant MS4 Permit requirements. The selection of contractors shall comply with the procurement policy of the CCRPC and with applicable state and federal procurement laws and procedures.

c. Contracts shall generally be 1 to 5 years in length and shall include, but not be limited to, a Maximum Limiting Amount and the right of the CCRPC to 1) cancel a contract if services are not being adequately provided, 2) specify that payments to contractors shall be made only for services rendered, 3) specify the annual scope of work and budget as approved by the Steering Committee, 4) allow a contract extension if desired, and 5) assign the contract to the MS4 Permittees that are signatories to this Agreement at the time of the assignment or to a contractor of the Steering Committee's choosing.

d. Contracting for services under this Agreement shall comply with the Fair Employment Act and Americans with Disabilities Act: the CCRPC shall comply with the requirement of Title 21 V.S.A Chapter 5, Subchapter 6, relating to fair employment practices, to the full extent applicable. The CCRPC shall also ensure, to the full extent required by the Americans with Disabilities Act of 1990, that qualified individuals with disabilities receive equitable access to the services,

programs, and activities provided by the Steering Committee under this Agreement. This provision shall also be included in all contracts and subcontracts executed under this Agreement.

e. The CCRPC and the Steering Committee recognize the important contribution and vital impact which small businesses have on the State's economy. In this regard, the CCRPC shall ensure a free and open bidding process that affords all businesses equal access and opportunity to compete, except under circumstances where competitive bidding may not be practicable and is not required by applicable procurement policies. The CCRPC and the Steering Committee also recognize the existence of businesses owned by minorities and women, and the CCRPC shall make a good faith effort to encourage these firms to compete for contracts involving state or federal funds and comply with applicable law relating to civil rights and disadvantaged business enterprises.

8. Program Services – The Steering Committee, assisted by the CCRPC and its contractors, shall implement a unified Program that satisfies the relevant requirements of Minimum Control Measure One (Public Education and Outreach) and Minimum Control Measure Two (Public Involvement and Participation) of the MS4 Permit.

   The Program Content for each Program Year shall be as defined in writing by a majority of the Steering Committee. The Program Year shall be the State of Vermont's fiscal year. The Program Content shall implement the following deliverables:

   a. **Public Education and Outreach** – Elements shall include, at a minimum:

      1) operating the Program's website, www.smartwaterways.org, or its equivalent; and

      2) advertising in various media.

   b. **Public Involvement and Participation** – Elements shall include, at a minimum:

      1) operating the Program's website, www.ccstreamteam.org, or its equivalent;

      2) hosting and/or organizing workshops, projects, and other events to engage the public; and

      3) recruiting volunteers to support projects, promote events, and/or engage the public.

   c. **End of MS4 permit year annual reporting** – Elements shall include preparation of a narrative report 25 business days prior to the MS4 Permittees' reporting deadline to DEC.

9. Program Dues, Budget, Costs, and Payments

   a. **Dues**

      1) For State Fiscal Year, FY18, July 2017-June 2018, the annual dues for each of the undersigned MS4 Permittees shall be $5,500.

2) For the following fiscal years, the annual dues shall be set by a two-thirds majority by October 15th of the preceding calendar year. In the absence of agreement, the dues shall remain at $5,500.

3) The CCRPC shall invoice each MS4 Permittee on or about July 1st of each year with payment to the CCRPC due 30 days later.

4) All Members shall pay equal dues.

b. **Program Budget**

1) The annual Program Budget shall consist of the sum of the annual payments for each Program Year made by MS4 Permittees, plus any funds from other sources made available to the Program by majority vote of the Steering Committee.

2) Prior to the start of each Program Year, the Steering Committee shall adopt a Program Budget governing expenditures for the subsequent Program Year. Budget categories shall include, but not be limited to: CCRPC Duties, Contractual Services, and Expenses.

3) Once the Program Year starts, a majority of the Steering Committee may amend the Program Budget as needed, for example to reflect any surplus or deficits from the prior Program Year, receipt of new sources of funds, or a desired change in the Program Budget, subject to Section 8.a, above.

4) In the event that costs are less than anticipated or that grants or other funding sources become available, a majority of the voting Members of the Steering Committee may decide to reduce each Member's payment by an equal amount or to credit all or part of the following Program Year assessment to each MS4 Permittee.

c. **Maximum Annual Costs and Payments** – Except as otherwise provided by this section, each MS4 Permittee shall within 30 days of receipt of an invoice make a single annual dues payment, as provided by Section 8.a, above.

d. **Other Funds** – Any funds made available to the Program shall be dedicated to reducing the annual costs of each MS4 Permittee participating in the Program, except as a majority of the voting Members of the Steering Committee may decide.

e. **Excess Funds** – Any funds remaining at the end of a Program Year shall be carried over to the next Program Year, unless a majority of the voting Members of the Steering Committee decides otherwise.

f. **Non-appropriation** – The obligations of each MS4 Permittee to make payments under this Agreement shall constitute a current expense of the MS4 Permittee and shall not in any way be construed to be a debt of the MS4 Permittee in contravention of any applicable constitutional or statutory limitation or requirement, or the MS4 Permittee's charter or articles of incorporation; nor shall anything contained in this Agreement constitute a pledge of the credit or tax revenues, funds, or monies of the MS4 Permittee. The decision whether or not to budget and appropriate funds during each fiscal year of the MS4 Permittee is within the discretion of the governing body

of the MS4 Permittee. The obligations of a MS4 Permittee under the Agreement are subject to annual appropriations by the governing body of the MS4 Permittee, except as provided by Section 12 of this Agreement. An MS4 Permittee cannot choose to not appropriate funds and then withdraw in a manner that shifts prior contractual obligations on to the others. Non-appropriation will be considered withdrawal and must be prospective in fairness to all signatories as per Section 13.

10. **Contract Approval** – All CCRPC contracts shall be conditioned upon approval by a majority of the voting Members of the Steering Committee and shall be consistent with Section 6, above.

11. **Termination of CCRPC** – The CCRPC on its own or the Steering Committee by a majority vote of its full Membership may elect to terminate the CCRPC's future participation in this Agreement by providing 90 days' written notice to the other. In the event of termination under this section, the CCRPC shall continue to administer and comply with each existing contract, and the MS4 Permittees shall continue to reimburse the CCRPC from the Program Budget for the actual costs of administering and complying with each contract, as provided by this Agreement, unless and until the CCRPC assigns the contract pursuant to Sections 5.a.8 and 6.c of this Agreement.

12. **Termination of Agreement**

    a. This Agreement shall become null and void with no further obligation of the parties if:

        1) Two-thirds of the Members of the Steering Committee vote to end participation, or

        2) DEC determines that the Program outlined in this Agreement does not meet the relevant requirements for Minimum Control Measure One (Public Education and Outreach) or Minimum Control Measure Two (Public Involvement and Participation), and the parties to this Agreement are unable to craft a Program to satisfy DEC.

    b. In the event of termination, any funds remaining in the Program Budget (after payment of obligations to vendors or to satisfy debts) shall be reimbursed to the MS4 Permittees with each MS4 Permittee receiving a share proportional to the number of MS4 Permittees at the time of termination. For example, if there are twelve MS4 Permittees at the time of termination, each MS4 Permittee shall receive a $1/12^{th}$ share.

13. **Withdrawal of Member** – An MS4 Permittee may withdrawal from participation in this Agreement only at the end of a state fiscal year. If an MS4 Permittee wishes to withdrawal from participation, it shall provide at least 90 days' notice to the other MS4 Permittees and the CCRPC. After withdrawal, a MS4 Permittee shall remain responsible for its share of the costs of contracts that the Steering Committee approved prior to the effective date of the withdrawal.

14. **Effective Date and Duration of Agreement** – The effective date of this Agreement shall be July 1, 2017, and this Agreement shall terminate June 30, 2022.

15. **Amendment** – This Agreement may be amended only upon unanimous action of all the Members.

16. **Counterparts** – This Agreement may be executed in multiple counterparts, each of which is deemed an original and all of which constitute one and the same document. Each such counterpart may be a facsimile or PDF copy, and such facsimile or PDF copy shall be deemed an original.

17. **Public Records** – Any and all records submitted to the CCRPC or MS4 Permittees - including Bids, Proposals, Qualifications, Contracts, etc.-- whether electronic, paper, or otherwise recorded, are subject to the Vermont Public Records Act.

Signature of CCRPC

Chris Roy, Board Chair, Chittenden County Regional Planning Commission — Date

Signatures of Members

Name — Title — The Burlington International Airport — Date

Name — Title — The City of Burlington — Date

Name: Dawn H. Francis — Title: Town Manger — The Town of Colchester — Date: 6/16/17

Name — Title — The Town of Essex — Date

Name — Title — The Village of Essex Junction — Date

Name — Title — The Town of Milton — Date

Name — Title — The Town of Shelburne — Date

Name — Title — The City of South Burlington — Date

Joe Flynn, Secretary of Transportation, Vermont Agency of Transportation _____ Date

Linda Seavey, Director, Campus Planning Services, The University of Vermont _____ Date

Name Title The Town of Williston _____ Date

Name Title The City of Winooski _____ Date

Regional Stormwater Education Program
110 West Canal Street, Ste 202
Winooksi, VT 05404

Invoice

Date	Invoice #
8/6/2019	130

Bill To
Karen Adams Technical Services Manager Town of Colchester PO Box 55 Colchester, VT 05468

Terms
Due on receipt

Quantity	Description	Rate	Amount
1	FY20 Dues: ReThink Runoff (formerly RSEP and CCST)	6,000.00	6,000.00

Thank you!

Total $6,000.00

KAA 8·7·19

21044 34- 4 80015

Grant Funding Update

The stormwater utility has been privileged to receive over $525,000 since we began operations in 2017. In addition to the approximately $300,000 in grant funding described in the Shore Acres project section on the opposite page of this newsletter, state and/or federal grant funds are also supporting the following stormwater utility projects:

- Town-wide Condition Assessment ($128,000)
- Phosphorus Control Plan ($40,000)
- BLUE® CVT ($10,000 - see back panel)
- Design of culvert replacements needed on Lower Mountain View Drive, to be constructed in coordination with the Exit 16 Diverging Diamond Project ($13,600)

Stormwater Utility Contact Info

To learn more about the Town's stormwater utility, including updates on current projects, please visit:
www.colchestervt.gov/1837/StormwaterUtility

Water Quality Hotline: (802)-264-5628

For general stormwater inquiries: (802)-264-5620

Malletts Bay Sewer Update

The Colchester Selectboard has requested the Planning Commission review and analyze options to address the lack of effective wastewater disposal capacity on inner Malletts Bay. The problem of inadequate human waste disposal in this concentrated area remains unsolved and affects those that live along the Bay, as well as the larger community that enjoys the recreation opportunities the Bay offers. The Planning Commission will begin by listening to and considering community concerns. Over the summer, solutions will be explored with the intent of presenting findings to the community in early fall. A tentative date of May 20th at the Colchester High School has been set for a public forum. Please visit the link below for more info:

tinyurl.com/ColchesterMBI

PRST STD
US POSTAGE
PAID
Burlington, VT
05401
Permit#478

ECRWSS

POSTAL PATRON

TOWN OF COLCHESTER
781 Blakely Road
Colchester, VT 05446

CLEAN WATER NEWSLETTER

Town of Colchester

CLEAN WATER NEWSLETTER

Spring 2019

Above: View of Mt. Mansfield from Malletts Bay
Courtesy of Cathy Chamberlin

Congratulations all - we've made it through winter! In this newsletter, learn about:

- BLUE® CVT Pilot Program
- Summer Water Quality Testing
- Annual Vermont Green-up Day
- Stormwater Utility Projects
- Malletts Bay Sewer Update

? Did You Know ?

The stormwater utility sends annual invoices to the mailing address on file for property tax billing with the Town Assessor, unless other arrangements are made. To update the billing information for your property, please call 802-264-5621.

BLUE® CVT Pilot Program

The stormwater utility is rolling out a new pilot program to provide one-time rebates to residential property owners who install stormwater measures on their property in the summer of 2019.

The first step is to have an evaluation by BLUE® Staff where your property will be visited and goals will be discussed (reducing erosion, addressing standing water, etc). They will prepare and provide you with a report suggesting recommended steps for your property. If one or more of the report recommendations are installed, you are eligible for a rebate from the utility for the installation cost up to the amounts listed in the chart below.

The site evaluation is **FREE** and covered through grant funding the utility has received. Property owners are responsible for funding the improvements and BLUE® staff will help you apply for the rebate. You are **not** committing to making any improvements on your property by having a site evaluation, and the program will cover any building permit fees that may be incurred. If you are interested in this program, please visit this page and fill out the form to schedule an evaluation:

http://tinyurl.com/BLUEcvt

Maximum Rebates Currently Available to Colchester Property Owners

Potential work	Rebate
Gutter / Downspout Application	$100
Rain Barrel	$100
Tree Planting	$100
Berm or Swale	$200
Dry Well or French Drain	$200
Gutter Redirection w/excavation	$200
Pervious Pavers	$200
Other Impervious Surface Replacement	$200

Ongoing Water Quality Projects

Pet Waste

The Colchester Parks and Recreation Department distributes thousands of pet waste bags every year in our recreation areas and parks. Please use these and dispose of them properly to keep our waterways clear of pet waste as we move into summer.

Hercules Drive Culvert Replacement

During July and August 2019 the town will be replacing culverts underneath Hercules Drive near the intersection of Hercules Dr & U.S. Rt. 2/7. The existing metal culverts have reached the end of their useful lives and will be removed and replaced with a larger plastic culvert. This will ensure the roadway is safe for vehicular traffic and allow more flow to pass under the roadway via Sunnyside Brook. This project will take 30 days to complete and the roadway will remain open to at least one lane of traffic at all times.

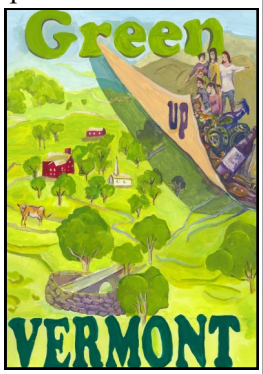
Shore Acres/Cedar Ridge Stormwater Project

The utility has received almost $300,000 in grant funding to install stormwater upgrades in the Shore Acres neighborhood. These improvements were identified through the Malletts Bay Scoping Study and are currently in the design phase, with construction scheduled for the summer of 2021. A public meeting will be announced when engineering plans have been developed, expected in spring 2020.

These projects will help reduce erosion from stormwater runoff and remove pollutants from water that ultimately reaches Lake Champlain. To view the conceptual plans for this project, please visit **http://tinyurl.com/ShoreAcresProject**

Vermont Green-Up Day

With spring, and the melting snow, comes Green-Up Day! On Saturday, May 4, Vermonters across the state will take to over 13,000 miles of highway to pick up what winter has left behind. Since 1970, Vermont residents have helped collect between 9,600 and 14,400 tons of trash (200 to 300 annually), thousands of tires, and helped discover dozens of illegal dump sites.



Green bags are available at the Colchester Police Department starting April 26, but if you wish to pick up trash in a specific area, please reach out to Theresa Carroll who is coordinating the Town's collection route. We want to make sure all trash bags are collected from the roadside. She can be reached at News110@comcast.net.

There will be a hot dog barbeque at the Colchester Police Department from noon until 1PM on Saturday, May 4th—all are welcome to join! For more information about Green Up Day, visit:

www.greenupvermont.org.

Above right: 2019 Winning Green Up Day Poster Designed by Uma Chirkova

Water Quality Testing Program

Annual water quality testing at public recreation areas will again be conducted in summer 2019 for ten weeks from mid-June through August. Samples are taken on Mondays and Wednesdays and sent to a water quality testing lab to ensure the waters are safe for swimming and other recreational sports. In the unlikely event of a beach closure, signs will be posted at swimming areas and additional tests will be completed until it is determined the water is safe for swimming. Tests results are also posted weekly on the stormwater utility website.

National Prescription Drug Takeback Days

Next Drug Takeback Day: Saturday, October 26!

The Colchester Police Department is pleased to announce that, not only are they planning to participate in the Vermont Department of Health and DEA sponsored prescription drug takeback event on October 26, there is now a permanent drop-off kiosk located in the lobby of the Police Department for residents to dispose of unwanted medications. This kiosk is accessible 24 hours a day, everyday.

This event intends to help prevent prescription drug abuse through proper disposal of medications. Properly disposing of unwanted or expired medications keeps them from being stolen or abused, and prevents the harm that can occur to drinking and surface waters as well as wildlife when medication is flushed. Onsite septic systems and centralized treatment facilities are not equipped to remove these substances from wastewater during treatment.

During the April 2019 event, 6,562 pounds of prescription medication was collected at dropoff sites around the state —the highest total since the program started in Vermont in 2015.

For more information about National Take Back Day, check out **takebackday.dea.gov.**

Stormwater Utility Information

The Town's stormwater utility began in 2017 as part of the Malletts Bay Initiative. The utility implements clean water programs, manages capital projects, and oversees regulations designed to improve and protect the community's water resources. For more info:

www.colchestervt.gov/1837/StormwaterUtility

Water Quality Hotline: **(802)-264-5628**

General stormwater inquiries: **(802)-264-5620**

PRST STD
US POSTAGE
PAID
Burlington, VT
05401
Permit#478

ECRWSS

POSTAL PATRON

TOWN OF COLCHESTER
781 Blakely Road
Colchester, VT 05446

CLEAN WATER NEWSLETTER

Town of Colchester
Stormwater Utility

CLEAN WATER NEWSLETTER
Fall 2019

Above: View of Marble Island as illustrated on a postcard from the early to mid-20th century.

As the leaves change and we ready for fall, here is the latest Colchester Stormwater Utility Clean Water Newsletter from the Department of Public Works. In this edition of the newsletter, learn about:

- Fall Project Updates
- Hercules Drive Culvert Project Completion
- 2019 BLUE® CVT Program
- Spring 2020 Billing Information
- National Prescription Takeback Day

? Did You Know ?

Colchester is home to over 3,000 acres of wetlands, and enjoys over 50 miles of shoreline along Lake Champlain, the Winooski and Lamoille Rivers, and Colchester Pond.

BLUE® CVT Pilot Program Update

Throughout spring and summer 2019, the stormwater utility offered a pilot program in partnership with watershed education organization BLUE® that proved to be very successful. The program offered site evaluations and recommendations to property owners on ways to manage stormwater runoff on their property.

Initially the utility had a goal of recruiting 20 participants, and ended up being able to offer services to 30 homeowners total. BLUE® staff will continue working with homeowners moving forward with improvements throughout the fall, and plans to have all financial rebates mailed to property owners by the end of the calendar year.

Due to the popularity of the program, the stormwater utility is evaluating ways to offer this program again to residential homeowners next spring and summer. Stay tuned for more information and thank you to all the homeowners that participated this year!

Below: Example of a rain barrel installation that was eligible for a rebate under the BLUE® CVT program offered this summer by the utility.

Ongoing Water Quality Projects

Fall Public Works Clean Water Projects

- The Department will be conducting a driveway culvert inventory this fall with the help of student interns. Driveway culverts are an important part of the roadside drainage network and this information will assist staff when responding to resident requests, preparing for storm events, and assist in capital planning efforts.
- A construction project at the intersection of Renkin and Colonial Drives in late October will involve the replacement of an existing stormwater structure that has failed.
- Improvements to drainage on Hillcrest Lane are planned to address ongoing issues with standing water on the surface of the roadway.
- Design work continues for a culvert replacement project under Lower Mountain View Drive, to be coordinated with the Exit 16 intersection project.
- Work continues on the development of the Town's phosphorus control plan, which must be completed by 2021 per state permit requirements.

Moorings Stream/Shore Acres Stormwater Project

This ongoing Malletts Bay Initiative water quality project is focused on the Moorings Stream watershed (the Shore Acres / Cedar Ridge neighborhood), and is partially funded by a grant from the VT Agency of Transportation. Conceptual plans for the project were presented to the public and State of Vermont in April of 2019. Feedback received from both the State and the public will be considered during the development of preliminary project plans, which will take place throughout the winter and spring of 2019/2020. These preliminary plans should be complete by early summer 2020, when there will be additional public meetings and input opportunities provided.

These improvements will help to filter and treat stormwater runoff before it reaches the Moorings Stream and ultimately, Lake Champlain. To view the conceptual plans for this project, please visit: **http://tinyurl.com/ShoreAcresProject**

Water Quality Projects (Cont.)

Hercules Drive Culvert Replacement

Over the summer, the stormwater utility completed a culvert replacement project on Hercules Drive. The metal culverts approximately 500 feet from the intersection of Hercules Dr and Roosevelt Highway were removed and replaced with a larger plastic culvert. This upgrade allows for additional water to pass under the roadway during storm events and ensures the roadway surface is safe for the traveling public. A big THANK YOU to drivers and surrounding property owners for their patience as we completed this important project.

Below: crews at work on Hercules Drive in August 2019.

Spring 2020 Billing Information

Annual stormwater utility invoices will be mailed in January 2020 with payments due February 21, 2020. These fees fund critical system repairs, keep the town stormwater system in compliance with state and federal water quality requirements, plan for future upgrades and improvements, perform water quality testing, and explore new stormwater treatment programs like BLUE®CVT (side panel).

Commercial properties are eligible to apply for credits to reduce their site fee. For more information about credits, visit the utility webpage listed on the front page of the newsletter.

MCM #1
REGIONAL STORMWATER EDUCATION PROGRAM
RETHINK RUNOFF

JANUARY–DECEMBER 2019
ANNUAL REPORT

Prepared by:

Pluck

209 College Street 3E, Burlington, VT 05401 p 802.224.6975 e hello@pluckvermont.com w pluckvermont.com

pluck

209 College Street 3E, Burlington, VT 05401 p 802.224.6975
e hello@pluckvermont.com w pluckvermont.com

Introduction

Since 2003, Chittenden County's twelve MS4s have worked to pool resources to professionally engage the public in a one message, one outreach effort known as the Regional Stormwater Education Program. Through regular spring and summer advertisements to drive people to the program's website, www.smartwaterways.org, this cooperative approach to fulfilling its NPDES Permit Minimum Control Measure #1 (Public Education & Outreach) requirements has built a regional awareness among the public of the need for individual action to assist in fighting stormwater problems.

In the summer of 2016, the MS4s contracted with Tally Ho through their Lead Agency, the Chittenden County Regional Planning Commission, to rebrand the Smart Waterways campaign into a combined effort with the MS4's Minimum Measure #2 regional effort known as the Chittenden County Stream Team. The goal was to create one cohesive organization and outreach effort to both educate the public about stormwater and boost public participation in implementation of projects to combat the negative impacts of stormwater. In spring of 2017, Rethink Runoff was publicly launched, including a new website and revised creative.

In late 2017, Tally Ho transitioned to Pluck, retaining the same client contact. Pluck subsequently took over the creative, administration, and management of Rethink Runoff.

This 2019 calendar year report recaps the work done primarily related to Minimum Control Measure #1.

2019 Initiatives

Having completed the initial rebranding to Rethink Runoff and the website redesign in 2017, and a focus on updating the advertising in 2018, this past year left us a canvas to improve on the work done.

We revised digital display advertising and updated all three video animations for YouTube. Similar to last year, we targeted various demographics in all MS-4 towns based on subject matter and interests (home improvement, gardening, fishing, water recreation, pets, etc.).

In addition to a heavy YouTube presence, videos were also shown on WCAX in limited quantity as well as on Comcast/Infinity cable stations.

Print advertising in *Seven Days* also continued our seasonal approach, increasing visibility for specific activities at specific times.

In addition to advertising, we revised content across the website. We simplifed top-level messaging, simplifying terms and making headlines and introductions more conversational in nature. The same shift in content was carried throughout the subpages as well.

We also created a new system of materials for the Stream Team. For events, we created a tabling system, including a branded tablecloth and a large-scale pop-up banner with top-level messaging. In addition, we finalized the Rain Garden signage.

We created a series of print materials:

- A rack card highlighting simplified actions that homeowners can take to mitigate runoff.
- Another rack card highlighting the Stream Team and its various activities and initiatives.
- A small call-to-action card, printed on seed-based paper that could be planted with wildflowers native to the Northeast.
- Series of downloadable posters, 8.5x11 and 11x17, for each of our ad series: Champ, Car Care, Rain Gardens, Pets, Rain Barrels, and The Stream Team.

pluck

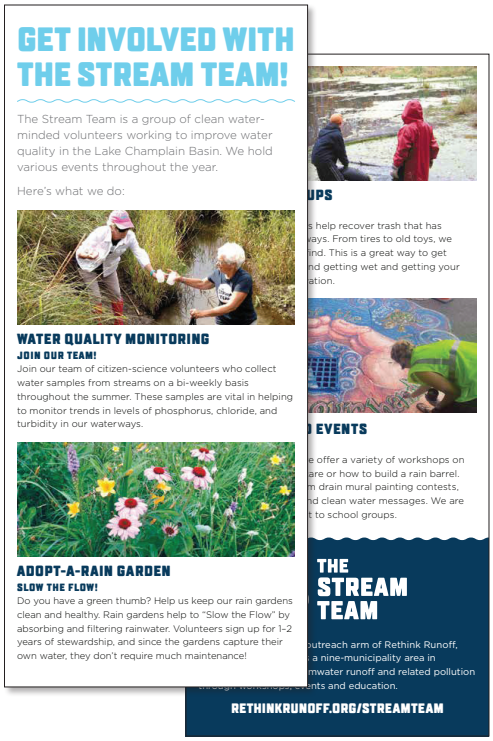
209 College Street 3E, Burlington, VT 05401 p 802.224.6975
e hello@pluckvermont.com w pluckvermont.com

Stream Team Outreach Materials

COMMUNITY RAIN GARDEN SIGNAGE

POP-UP BANNER

CALL-TO-ACTION SEED CARD

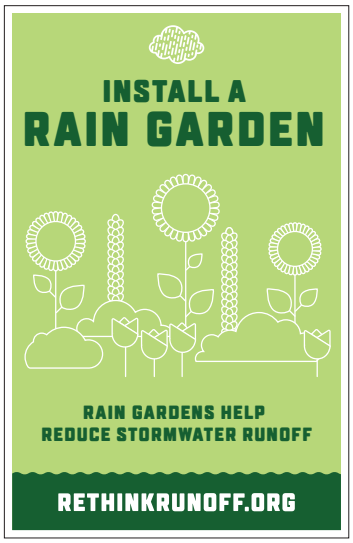


RACK CARDS

pluck

209 College Street 3E, Burlington, VT 05401 p 802.224.6975
e hello@pluckvermont.com w pluckvermont.com

Downloadable Posters



pluck

209 College Street 3E, Burlington, VT 05401 p 802.224.6975
e hello@pluckvermont.com w pluckvermont.com

Media Buy Breakdown

Below is a cost breakdown of media buys, compared with 2016, 2017, and 2018. Overall, we've continued to reduce our radio media buys, shifting to a larger digital media buy. This past year, we also increased our television media buy, since we have three different focused animated spots.

We added a small media buy in January/February, focused on pet waste pick-up—something we will continue to do in 2020. In addition, we've continued to roll over any excess spring digital media buys into a longer summer media buy.

2016 – MEDIA BUY			
SOURCE	SPRING	SUMMER	FALL
RADIO	$4,500	-	$3,258
DIGITAL	$7,500	-	$4,985
TV	$5,500	-	$2,379
PRINT	$2,500	-	
TOTAL	$20,000	-	$10,622

2017 – MEDIA BUY			
SOURCE	SPRING	SUMMER* 05/28–08/02	FALL
RADIO	$3,088	-	$1,080
DIGITAL	$3,600	$3,826	$4,582
TV	$2,015	-	$1,833
PRINT	$1,755	$585	$1,170
TOTAL	$13,191	$4,235	$8,666

2018 – MEDIA BUY			
SOURCE	SPRING	SUMMER* 6/16–08/27	FALL
RADIO	$2,675	-	$1,044
DIGITAL	$3,394	$7,534	$2,987
TV	$3,710	-	$2,472
PRINT	$1,755	-	$1,006
TOTAL	$11,534	$7,534	$7,509

2019– MEDIA BUY				
SOURCE	WINTER	SPRING	SUMMER* 5/27–09/2	FALL
RADIO	$360	$1,008		$1,025
DIGITAL	$1,800	$2,320	$5,830	$3,000
TV		$5,830		$3,306
PRINT	$503	$2,012		$1,006
TOTAL	$2,663	$11,170	$5,830	$7,509

* For 2017 and 2018, Summer was initially planned as part of the spring 2018 budget. Moving forward, the spring media buy will include all purchases made through 7/1. The Fall media buy will include any media buys made from 7/1 to the end of the summer.

pluck

209 College Street 3E, Burlington, VT 05401 p 802.224.6975
e hello@pluckvermont.com w pluckvermont.com

Creative

Advertising during 2017 included redesigned creative, incorporating existing messaging with a new visual language based on Rethink Runoff. In, 2018, we created a series of three :30 animated video spots (installing a rain garden, installing a rain barrel, and avoiding fertilizer), exporting one as a radio spot. In addition, we began introducing additional seasonal display advertising, including a series for Clean Water Week.

Advertising for 2019 included updated 2017 creative as well as new ads released from April–July, tied to spring/summer activities. All ads were rolled out in 8–10 different sizes. Fertilizer and Rain Garden ads were positioned in early spring and fall. Rain Barrel and Fishing ads were positioned in late spring through fall. Water Recreation was pushed through summer to early fall while the General, Champ and Stream Team ads were positioned from early spring through fall. The media buys for the video reflected the display ad media buys. We also created winter-specific Pet Waste ads to target pet owners who may not pick up their pet waste in the winter, placing media buys in late January/February 2019.

Revised Creative

GENERAL LAKE

STREAM TEAM

FERTILIZER

GENERAL CHAMP

SLOW THE FLOW

RAIN GARDEN

RAIN BARREL

FISHING

PET WASTE 1

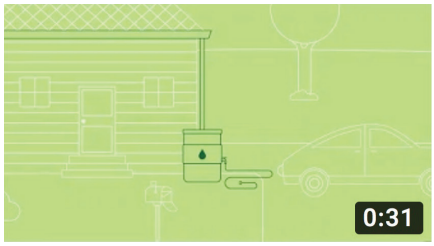
PET WASTE 2

WATER RECREATION

Videos

APRIL - FERTILIZER
HTTPS://WWW.YOUTUBE.COM/WATCH?V=T8BY6UBQSUW

MAY - RAIN GARDEN
HTTPS://WWW.YOUTUBE.COM/WATCH?V=E9RNXJSYE1G



JUNE - RAIN BARREL
HTTPS://WWW.YOUTUBE.COM/WATCH?V=ZZJ_MEP9Q_Q

pluck

209 College Street 3E, Burlington, VT 05401 p 802.224.6975
e hello@pluckvermont.com w pluckvermont.com

Advertising Click-through Rates, 2019

SOURCE	IMPRESSIONS	INTERACTIONS/ VIEWS	COST	COST PER CLICK
DISPLAY ADS	4,432,126	4,870	$6,910	$1.41
VIDEO (YOUTUBE)	380,633	176,983	$3,850	$0.02
WCAX DIGITAL	200,004	116	$1,500	$12.93

Google Display Ads Overview, 2019

Most Popular by Impressions

CALENDAR YEAR 2019 NAME
GENERAL LAKE
PET WASTE
RAIN GARDEN

SPRING: 4/15–MEMORIAL DAY NAME
RAIN GARDEN
GENERAL CHAMP
GENERAL LAKE

SUMMER: MEMORIAL-LABOR DAY NAME
RAIN GARDEN
GENERAL LAKE
GENERAL CHAMP

FALL: LABOR DAY-10/31 NAME
GENERAL LAKE
FERTILIZER
GENERAL CHAMP

Most Popular by Interaction

CALENDAR YEAR 2019 NAME
GENERAL LAKE
PET WASTE
RAIN GARDEN

SPRING: 4/15–MEMORIAL DAY NAME
GENERAL LAKE
GENERAL CHAMP
RAIN GARDEN

SUMMER: MEMORIAL-LABOR DAY NAME
RAIN GARDEN
GENERAL LAKE
PET WASTE

FALL: LABOR DAY-10/31 NAME
GENERAL LAKE
FERTILIZER
GENERAL CHAMP

Most Effective by Cost-per-click

CALENDAR YEAR 2019	
TOTAL	TIME PERIOD
FERTILIZER	$0.55/CLICK
RAIN GARDEN	$0.58/CLICK
GENERAL CHAMP	$0.59/CLICK

SPRING: 4/15–MEMORIAL DAY	
TOTAL	TIME PERIOD
GENERAL CHAMP	$0.55/CLICK
RAIN GARDEN	$0.56/CLICK
GENERAL LAKE	$0.67/CLICK

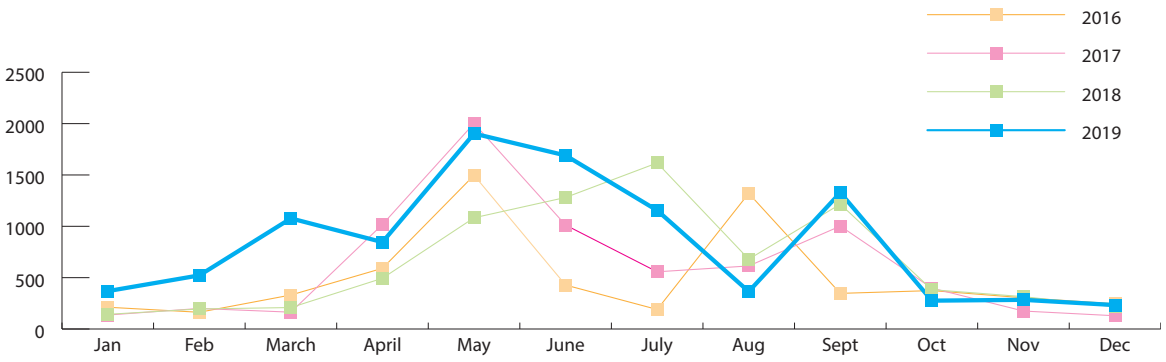
SUMMER: MEMORIAL-LABOR DAY	
TOTAL	TIME PERIOD
RAIN GARDEN	$0.58/CLICK
GENERAL CHAMP	$0.63/CLICK
GENERAL LAKE	$0.69/CLICK

FALL: LABOR DAY-10/31	
TOTAL	TIME PERIOD
FERTILIZER	$0.54/CLICK
GENERAL CHAMP	$0.58/CLICK
GENERAL LAKE	$0.76/CLICK

pluck

209 College Street 3E, Burlington, VT 05401 p 802.224.6975
e hello@pluckvermont.com w pluckvermont.com

Website Metrics for 2013–2019



2019 vs. 2018 Users

+26.05%

8,531 vs 6,768

New Users

+27.95%

8,529 vs 6,666

Pageviews

+30.64%

15,769 vs 12,071

Total Sessions/Visits (1/1–12/31)

TOTAL	TIME PERIOD
10,111	2019
7,832	2018
7,407	2017
6,004	2016
4,659	2015
7,728	2014
3,541	2013
2,787	2012

Website visits by device

DEVICE	2019	2018	2017	2016
DESKTOP	40.2%	50.1%	52.8%	65.7%
MOBILE	44%	40.6%	36.4%	24.5%
TABLET	15.8%	9.3%	10.8%	9.8%

Top Vermont Cities and Towns, 2019

TOTAL	USERS	
BURLINGTON	1354	27.32%
SOUTH BURLINGTON	877	17.73%
COLCHESTER	784	15.84%
ESSEX/ESSEX JCT.	770	15.56%
SHELBURNE	254	5.12%
HINESBURG	120	2.43%
WILLISTON	98	1.98%
SAINT ALBANS CITY	97	1.96%
MONTPELIER	59	1.17%

New York, 193 Users

Boston, 47 Users

Most visited pages, 2019

TOTAL
HOMEPAGE
GET EDUCATED/PROBLEMS & SOLUTIONS/RAIN GARDEN
GET EDUCATED/PROBLEMS & SOLUTIONS/PET WASTE
GET EDUCATED
GET EDUCATED/PET WASTE
GET INVOLVED
EXPLORE THE LAKE CHAMPLAIN BASIN
GET EDUCATED/KIDS
GET EDUCATED/REDUCE FERTILIZER
GET EDUCATED/ALGAE BLOOMS

MS4 Annual Report Attachments – MM2

See MM1 Attachments section for Documentation of participation in regional stormwater public involvement and participation strategy.
- Rethink Runoff's 2019 Annual Report on MM2
- 2019 Water Quality Monitoring Interim Report
- Catch Basin Stenciling Proof & Invoice
- 2019 Green Up Day Totals
- 2019 Conservation Commission Report Describing Green Up Day Participation

MCM #2: Rethink Runoff Stream Team Summary of Activities
2019 Calendar Year

Social Media

Facebook

- Total Posts = 29
- 254 total "likes"
- 294 total "follows"

Instagram

- Total Posts = 16
- 179 total "follows"

RRST Website

- See final report from Dave Barron (Pluck Design)
- Added outreach events to calendar on website

Newsletter and e-correspondence

- As of 12/9/19 there were **629** subscribers to the RRST newsletter (an increase from 508 in 2018) The average open rate for emails was about 30%
- Spring Newsletter Published on 2/26/19 Opens: 179 Clicks: 21
- Summer Newsletter Published on 7/9/19 Opens: 185 Clicks: 29
- Fall Newsletter Published on 11/22/19 Opens: 172 Clicks: 23

Organizational Partnerships

The Rethink Runoff Stream Team partnered with 11 organizations in 2019:

1. **Shelburne Community School** - A teacher at Shelburne Community School invited the RRST coordinator to teach a 1-hour class to 5th graders to kick off their watershed and ecology unit - Lesson taught to 90 students on 4/4/19, 40 of those students also helped complete the Storm Drain Mural project in Shelburne by designing and painting raindrops to contribute to Julie Holmes's mural on 9/27/19
2. **Essex Middle School** - Taught a mini rain barrel workshop to 8 students 5/10/19
3. **Williston Master Naturalists** - The Master Naturalists volunteered to help organize riparian stewardship days at the Allen Brook tree planting site from last year. They recruited community volunteers to help weed, clear trash and inventory tree survival rates. (4/28/19 and 5/4/19)
4. **Winooski Valley Parks District** - WVPD hosted Conservation Field Day 5/15/19 bringing together area schools for a day in Ethan Allen Homestead Park. RRST facilitated a station called "Build a Watershed" where students created a 3D model of a fictional community and used a spray bottle to observe the impact of runoff and pollution in their community.
5. **Cub Scout Pack 678** - Rain Garden adopters in S. Burlington
6. **Marsh-Billings Rockefeller National Historical Park** A guest intern from the park visited for a day to assist the Stream Team coordinator with checking in samples and to learn about the structure of the citizen science program.
7. **Williston Conservation Commission** - Coordinated to decrease the cost of delivering water quality samples to the new lab in Randolph by sharing a courier service.

8. **Brownell Library** - Allowed RRST to host a kid's watershed activity hour as part of their "Wonder Wednesday" series and to set up a "pop up" style information table before their most popular speaker series for adults. (11/6/19) Also displayed books from the Clean Water Reading List for the month of November.
9. **State of Vermont: LaRosa Water Quality Sampling Grant** - The RRST coordinator successfully applied for a grant from the State of Vermont to cover for the cost of analyzing water quality samples at the VAEL lab in Randolph. The value of the lab services that this grant made available this year was approximately $3,000.
10. **Shelburne Farms** - Invited RRST to table at the annual Shelburne Harvest Festival
11. **Watersheds United Vermont (WUV) & Watershed Consulting Associates (WCA)**: WNRCD was awarded a grant that allows them to meet with a watershed data professional to discuss the analysis of water quality sampling data. Discussions with WCA will inform the Stream Team water quality sampling program in 2020 and beyond.

Media Rethink Runoff Stream Team had **7** media appearances in 2019:

1. Article published in international Stormwater Management publication (published by WEF Stormwater Institute) Volume 7, Issue 1 Spring 2019 - Cover picture and article on pages 20-21 https://www.wef.org/resources/publications/all-magazines/world-water-stormwater/
2. Article published in The Other Paper to recruit water quality monitoring volunteers (5/9/19) https://www.otherpapersbvt.com/news/around_town/volunteer-as-a-summer-water-quality-monitor/article_e0a70cd2-7290-11e9-b09b-a3c0e2ed59fc.html
3. Call for Artists published in Milton Independent on (7/4/19) https://issuu.com/miltonindependent/docs/2019_0704_forweb
4. Milton Independent Follow-Up (7/31/19) https://www.miltonindependent.com/art-for-awareness-muralists-adorn-milton-storm-drains/
5. Call for Artists Shelburne News (8/29/19) http://www.shelburnenews.com/2019/08/29/call-artists-storm-drain-mural-project/
6. Stream Clean Up Article in Williston Observer (9/26/19) https://issuu.com/vermontmaturity/docs/9-26-19_no._2__final
7. Shelburne Storm Drain Mural Article in Shelburne News (10/3/19) http://www.shelburnenews.com/2019/10/03/pavement-murals-point-trouble-water-runoff-real-problem/

Figure 1: Thumbnails of some 2019 RRST appearances in local newspapers

This document was prepared by the Winooski Natural Resources Conservation District, who is contracted by Chittenden County's MS4 Committee to run the RRST program.

Outreach

Outreach includes any educational opportunities or tabling events where resources or information are provided to the community about the RRST program. There were **six** outreach events in 2019, with an estimated total outreach to = **278** people.

Outreach events in 2019 targeted the municipalities of **Colchester, Essex and Essex Junction**

- **Colchester** Community Dinner Tabling Event (3/4/19)
  - **25** residents reached
- **Shelburne** Watershed Lesson at Shelburne Community School (4/4/19)
  - Reached 90 5th grade students and 10 adults = **100** total
- **Various Municipalities:** Conservation Field Day with Winooski Valley Parks District (5/15/19)
  - Taught a 25-minute station called "Build a Watershed" to 5 groups of 5th grade students
  - Reached **60** students and chaperones (equal amounts from S. Burlington, Burlington, Colchester and Essex Junction)
- **Various Municipalities:** Shelburne Harvest Festival (9/21/19)
  - Table was hosted by Winooski NRCD with a portion of the table dedicated to Stream Team materials. Many residents in the RRST area had questions about water quality and engaged with the stream team materials. About **50** total people reached: 10 Burlington, 10 S. Burlington, 10 Essex & Essex Junction, 20 Shelburne)
- **Essex Junction** Library Project 11/6/19
  - The RRST coordinator taught a kid's watershed activity hour as part of the ongoing "Wonder Wednesday" series. 13 kids and 10 parents attended. Kids played "Butterfly River" and "Build a Watershed." Kids who arrived early also studied that map of the Lake Champlain Basin to look for clues about the meaning of the word "Watershed." Many families took handouts and copies of the Stormwater Maze at the end of the session.
  - RRST set up a "pop up" style information table before their most popular speaker series for adults. The RRST coordinator spoke with 20 people. Many people took handouts or asked questions about stormwater on their property. Many residents expressed frustration at living in condo associations where they feel less empowered to make water-friendly changes to their space. We may explore opportunities for outreach to condo associations in the future to address this need.
  - Total in-person outreach = **43 residents**
  - The library also displayed books from the Clean Water Reading List for the month of November. The books were available for library members to check out and RRST stickers and handouts were also available for anyone to take for free.
- **Essex** Library Project
  - An outreach event was planned at Essex Library for fall 2019 that was similar to the Brownell Library program, but the library experienced flooding in their community room. This program has been rescheduled to January 2020

Figure 2: Left: Books from the Clean Water Reading List on display at Brownell Library. Right: Tabling display set-up including the new Clean Water Trivia Board and newly printed Rethink Runoff tablecloth

The 2019 work plan goal for outreach was 80 people, which was surpassed. A total of **278** people were engaged through outreach in 2019. Outreach towns for 2020 are Williston, Winooski and South Burlington.

New Outreach Activities Created:

1. Clean Water Reading List
2. Trivia Board
3. Watershed Curriculum from Shelburne Community School Program

New Outreach Tools Created with assistance from Pluck

1. "Get Involved" Rack Card
2. "Keep Lake Champlain Clean Rack Card"
3. Large standing sign
4. Tablecloth printed with RRST logo

Projects

Six hands-on events were held in 2019. Event-Driven Tasks involve community members in some form of hands-on engagement. Hands-on participation events in 2019 targeted the towns of Burlington, Shelburne, and Milton.

- **Burlington** Rain Barrel Workshop (5/4/19)
    - 32 barrels built, **47** Burlington residents attended
- **Essex** Mini Rain Barrel Workshop (5/10/19) 10 Essex residents reached (8 students, 2 adult chaperones = **10** total), 3 barrels created.
- **Williston** Riparian Stewardship Days
    - Williston, Allen Brook (4/28/19 and 5/4/19)
    - Over the course of both days about **20** volunteers helped tend to trees planted along the brook last year. They removed choking vines, weeded around the base of the trees and took an inventory of the trees to estimate survival rate (over 90%)
- **Milton** Storm Drain Murals (7/29/19)
    - Two murals painted in Milton - articles published in Milton Independent, great social media coverage. People involved included 2 artists, 5 family members of artists and 1 reporter.

Total: **8** people directly engaged.

- **Williston** Stream Clean Up (9/14/19)
    - **11** volunteers removed 15 bags of trash from tributaries to Muddy Brook
- **Shelburne** Storm Drain Murals (9/27/19)
    - Two murals painted in Shelburne. People involved included 2 artists, 40 local students involved in painting process and 1 reporter. (Total: **43)** Article published in Shelburne News.

A total of **139** people participated in hands-on RRST events in 2019. (A subcategory: A total of **86** people volunteered their time through RRST activities in 2019). Project towns for 2020 are Essex, Essex Junction, and Colchester.

City of Burlington Project: Rain Barrel Workshop

Summary: RRST coordinated a rain barrel workshop for the City of Burlington on May 4, 2019. 47 people attended and 34 barrels were constructed. Registration was $35 and sign-ups were coordinated online through Google Forms and the WRNCD PayPal account.

Advertising: Planning for the event began in January. The City of Burlington created a poster and the RRST coordinator created a press release and Facebook event. The following media venues were used to spread the word: Facebook, Instagram, Front Porch Forum, Rethink Runoff website, City of Burlington website, posters around town. This outreach garnered interest from 100 people (50 from Burlington, who were given top priority and 50 from other towns).

Challenges: RRST did encounter some challenges sourcing materials. The main supplier of plastic barrels discontinued ordering products in those containers, so the RRST coordinator sought other sources in the community. Unfortunately, the price of each barrel was more than double with the alternate sources. Plenty of staff time was spent troubleshooting this challenge. In the future we anticipate this project taking less time and costing less money.

Impact: The 34 barrels that were built will be installed at residences around Burlington and will help decrease the volume of stormwater during rain events. Participants will become advocates for clean water solutions in the City. The mailing list increased by 70 people due to folks who signed up for the list during the event registration period. Finally, we know there is high demand for rain barrel workshops. The RRST coordinator will work to secure a more stable source for the plastic barrels so that we can offer the workshop at an affordable rate for many years to come.

Costs: The total estimated cost to plan, manage, and implement this project was **$3,300.** The approximate personnel time used to plan and execute the project was 70 hours ($3,150). The total cost of supplies (less registration income) was $100. The mileage was about $50.

Figure 3: Participants at the Burlington Rain Barrel Workshop drill, assemble and caulk their new barrels.

Town of Milton Project: Storm Drain Mural

Summary: RRST coordinated a storm drain mural project in Milton. Four artist applications were received and two were selected: Erin Schmitt (a high school art teacher from Milton) and Jessica Zawicki (from St. Albans). On July 29, 2019 the artists painted their murals working from 9am to 5pm to complete the artwork.

Advertising: The RRST coordinator created a call for artists press release and used the following media venues to spread the word: Facebook, Instagram, Front Porch Forum and in the Milton Independent. A reporter from the Milton Independent also interviewed the RRST coordinator and took pictures of the artists on the day of the event. An article was published on 7/31/19. A link to the article can be found in the summary of publications on page 2.

Impact: The murals will stand as an enduring reminder to the residents of Milton that everyone is responsible for keeping storm water and Lake Champlain clean.

Costs: The total estimated cost to plan, manage, and implement this project was **$1,940.** The approximate personnel time used to plan and execute the project was 30 hours ($1,350). The total cost of supplies was $20. The mileage was about $40. Each of the artists was granted a $250 stipend for their materials and time, creating a contractual cost of $500.

Figure 4: Artist Jessi Zawicki paints her mural at the corner of Rt. 7 and Main St (7/29/19) Text says: "Drains to Champlain"

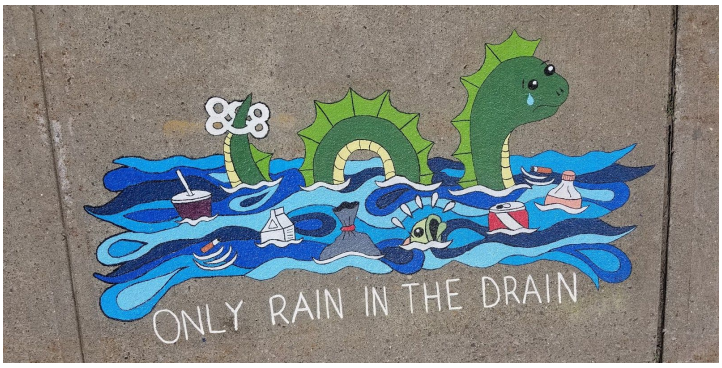


Figure 5: Artist Erin Schmitt paints her mural of Champ on Center Drive between Kinney Drugs and VT Federal Credit Union (7/29/19) Text says: "Only Rain in the Drain"

Fig 6: Social Media Splash! The Facebook post about the completed murals was shared by more than 10 people or organizations and seen by over 4.500 people.

Town of Shelburne: Storm Drain Mural

Summary: RRST coordinated a storm drain mural project in Shelburne in September. Twenty-four applications were received and two were selected. Heatheranne Lee (a high school student from Shelburne) and Julie Holmes (an artist and music teacher from Charlotte) submitted the winning designs. On September

27, 2019, the artists painted their murals. 40 Students from Shelburne Community School helped artist Holmes create her mural. Holmes's message was "Every Drop Counts." She wanted each student to paint a unique raindrop in the lake to represent how each person is unique and how each person's actions make a difference.

Advertising: The RRST coordinator created a call for artists press release and used the following media venues to spread the word: Facebook, Instagram, Front Porch Forum and a press release in the Shelburne News. A reporter from Shelburne News interviewed the RRST coordinator and artists. An article was published on 10/3/19. A link to the article be found in the summary of publications on page 2.

Impact: The murals will stand as an enduring reminder to the residents of Shelburne that everyone is responsible for keeping storm water and Lake Champlain clean.

Cost: The total estimated cost to plan, manage, and implement this project was **$1,960.** The approximate personnel time used to plan and execute the project was 30 hours ($1,350). The total cost of supplies was $55. The mileage was about $25. Each of the artists was granted a $250 stipend for their materials and time, creating a contractual cost of $500.

Figure 7: Artist Heatheranne Lee's Mural outside of Shelburne Country Store (9/27/19) Text says: "Keep the Water Clear, Remember Champ Lives Here"

Figure 8: Artist Julie Holmes's Mural outside of Pierson Library (9/27/19) Text says: "Every Drop

Counts, Keep It Clean"

Figure 9: Students from Shelburne Community School help Artist Julie Holmes's paint her mural outside of Pierson Library (9/27/19) Each student created a unique design to fit the theme "Every Drop Counts"

Stream Clean Up Program Summary

In partnership with Winooski NRCD, RRST completed a Stream Clean Up event in Williston on Sept 14, 2019. Eleven people attended and removed 15 bags of trash out of two tributaries to Muddy Brook. Most of the time spent on this event was covered by Winooski NRCD's independent agreement with the Town of Williston. Some advertising time was charged to RRST and Stream Team tabling materials and shirts were shared with all participants on the day of the event. The cost to RRST was approximately 10 hours or **$450**. Matching funds from WNRCD to fully execute the event were approximately $3,500.

Figure 10: Volunteers at the Williston Stream Clean Up 9/14/19

Water Quality Monitoring Program Summary

RRST has maintained an ongoing water quality monitoring program since 2012. Citizen science volunteers take water samples in urban or suburban streams that are impacted by sedimentation, excessive nutrient loading, high temperatures, bacteria, and other pollution. This data provides information to towns about long term trends and may help towns identify good locations for stormwater BMPs.

With another year of support from VT DEC's LaRosa program, RRST collected biweekly water quality samples at twenty-one sites on twelve streams in 2019. Twenty-one volunteers and one intern helped collect grab samples on five, biweekly Tuesdays from 6/25/19 - 8/20/19. Grab samples were analyzed for total phosphorus and chloride. These parameters were also sampled at five of the sites during one rain event. See

the 2019 Water Quality Monitoring Report in Appendix A for more information.

The training day for citizen science samplers took place on 6/11/19 at Landry Park in Winooski. This year two sessions were offered (morning and evening) to accommodate volunteers' schedules. RRST coordinator demonstrated sampling procedures, described the data collection sheets and answered questions. Throughout the season, volunteers returned their samples to the WNRCD office after sampling, and the RRST coordinator ensured all samples were accounted for and delivered to the lab. A challenge this year was that the lab moved from Burlington to Randolph VT. RRST partnered with the Williston Conservation Commission (which takes weekly water samples) to share the cost of a courier service (Green Mountain Messenger) to deliver samples and bringing back supplies. Volunteers were recognized at the volunteer appreciation event in Williston on 9/18/19.

The RRST coordinator sent bi-weekly emails to WQ volunteers to check in about sampling procedure and share interesting local water tidbits, and other ways to get involved. The coordinator also joined volunteers in the field periodically to discuss technique or clarify site locations.

Cost: The total estimated cost to plan, manage, and implement this project was **$3,650.** The approximate personnel time used to plan and execute the project was 80 hours ($3,600). The mileage was about $50. For match, the LaRosa grant offset approximately $2,600 of lab analysis fees.

Municipality	Number of Volunteers
Essex & Essex Junction	3
Colchester	2
S. Burlington	7
Burlington	4
Williston	3
Shelburne	1
Hinesburg	1
TOTAL	**21**

Table 1: Stream Team Water Quality Sampling Volunteers by town

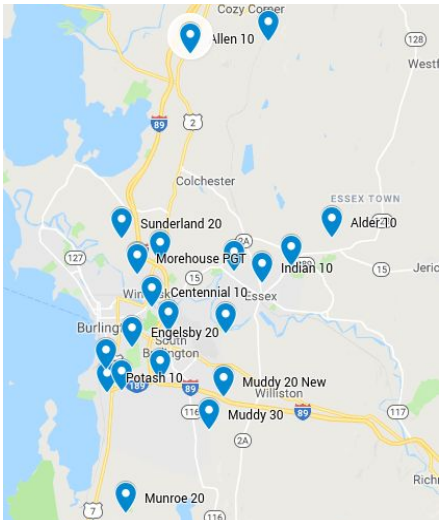


Figure 11: Map of Stream Team Sampling Sites 2019 Link to Interactive Map: https://drive.google.com/open?id=1K98F4bBO2E6p5lLKgSw7bxRSpQlzoo8Q&usp=sharing

Figure 12: Stream Team volunteers learn sampling protocol at the evening training (6/11/19)

Adopt-a Rain Garden Program Summary

The Stream Team's Adopt-a-Rain Garden program is an opportunity for individuals to assist in keeping Chittenden County's public rain gardens functional and attractive. This involves basic maintenance activities like picking up trash, pruning, pulling weeds, installing new mulch, and informing the coordinator of non-functioning gardens. There are currently ten public rain gardens managed by RRST. In 2018, there were four official adopters. In 2019, all ten gardens were cared for by various partners and volunteers. See table 2 for more details.

Signage: This year, with the help of Pluck, we rebranded the signs in all of the gardens with the new Rethink Runoff logo. A volunteer was recruited to assist with installing the signs.

Cost: The cost to manage and grow this program in 2019 was approximately 15 hours or **$675** for staff time.

Garden Status Update

Callahan Park Rain Garden

Location: 45 Locust St., Burlington

This garden has been functioning well for some time thanks to efforts by Brad Ketterling, who has adopted this garden for several years. In 2017, Burlington Public Works brought a load of mulch to the garden and Brad spread the mulch and kept up with weeding and monitoring the garden. Several understory shrubs and flowers have been shaded out by larger, overstory plants that need to be thinned. There are several locations that also need to be replanted, so efforts will be made to locate surplus plants that can be added in 2020.

Chamberlain School

Location: 262 White Street, South Burlington

This garden was installed in partnership with WNRCD and the Let it Rain Program in 2013. This is one of several rain gardens on the grounds of Chamberlain Elementary. School teacher Chris Provost adopted this garden again in 2019 and has actively maintained it for several years.

Coast Guard Station

Location: Depot Street, Burlington

This small garden is located in the parking lot abutting the bike path next to the Burlington Coast Guard Station. In 2014, RRST worked with the ECHO summer kids program to engage elementary school children in cleaning the garden and in 2015 a local resident, Wiley Reading, adopted the garden. The garden did not have an adopter from 2016-2018, but this garden got a "boost" of energy from 10 community volunteers through the Day in the Dirt event hosted by the Vermont Community Garden Network in spring of 2018. In 2019, it was adopted by Larry Kaupferman.

Farrell Park

Location: Swift Street, South Burlington

This garden is unique in terms of its design. It is called an "advanced wetland stormwater filter" and was installed in 2012. Stormwater enters the garden through an inlet, flows through the gravel wetland filter

media, is cleaned and exits through the other end. The garden requires very little maintenance because it has a flushing system that prevents sediment from building up. This garden had an active adopter for its entire life, until 2015 when the adopter moved away. The garden was never in need of additional plants or maintenance. It would not be appropriate to add mulch to this garden. In 2019, this garden was adopted by the O'Leary family. They completed a work day weeding and clearing the inlet and plan to keep an eye on the garden.

Landry Park
Location: North St., Winooski
This garden was constructed in 2006 as two, separate gardens along the narrow strip of grass between a fence at Landry Park and the road. Over the years, the gardens have become overgrown, but Winooski DPW officials believe it still functions well, even with the tall, dense shrubs. A few years ago, nearby road construction altered the slope of the road carrying larger volumes of water into the garden. The increased flows have killed some of the vegetation and caused gullies to form, but the vegetation seems to have rebounded. In 2016, a group of UVM students in an Ecosystem Design course developed recommendations to repair the garden. In 2019, RRST coordinator spoke with Tim Grover and Jon Choate of Winooski DPW who agreed to take on responsibility for the garden.

Williston Town Hall Annex
Location: 7900 Williston Rd, Williston
This small garden near the entrance walkway to the Annex building and the parking lot has had an active adopter since 2014: Rita Desseau. Rita maintained the garden in 2018. In 2019, additional work done was weeding, thinning larger shrubs, re-planting in bare spots, and mulching the garden.

Williston Library (aka. Dorothy Alling Memorial Library)
Location: 21 Library Lane, Williston
The Williston Library garden is in good condition and is primarily being cared for by the staff of the library. This garden was previously cared for by Andrew Wolf.

South Burlington High School (formerly the location of the South Burlington Library)
540 Dorset St., South Burlington
WNRCD received a grant to construct a rain garden at the entrance to what was the South Burlington Library (now South Burlington High School) in 2013. The rain garden received minimal maintenance by the library staff over the years, and was formally adopted in 2016 by Amy Niggel's Cub Scout 678 pack. The pack's leadership changed hands in 2018 and the new cubmaster Bill Kett agreed to continue maintenance of the garden with his pack. In 2019, scout parent Eric Bishop-vonWettberg took ownership of the garden stewardship program with the scouts. The RRST coordinator hosted an orientation and work day for a small group of scouts and leaders in spring 2019 and they have been keeping an eye on the garden ever since.

South Burlington Fire Department
575 Dorset St., South Burlington
The City of South Burlington installed this bioretention area/rain garden in 2015 to improve stormwater management at the Fire Department. Cub Scout pack 678 has volunteered to adopt this rain garden since

2016. Since there is new leadership in the pack, the RRST coordinator hosted an orientation and work day for a small group of scouts and leaders in spring 2019 and they have been keeping an eye on the garden since.

Rain Garden	Adopter 2019	Notes
Chamberlin School, South Burlington	Chris Provost and students	Long-time volunteer
Coast Guard Station, Burlington	Larry Kupferman	New volunteer this year - met in the fall for an orientation
Landry Park, Winooski	Town of Winooski	Spoke with Tim Grover in spring about maintenance plan
Williston Annex	Rita Dresseau	Long-time volunteer
Williston Town Library	Library grounds staff	Spoke with library leadership in 2018. Next year plan to formalize and agreement.
Callahan Park, Burlington	Brad Ketterling	Long-time volunteer.
Farrell Park, South Burlington	Roan O'Leary	New volunteer this year - local high school student. Met for orientation and work day.
Department of Corrections, South Burlington	Town of S. Burlington	Spoke with Tom DiPietro in spring about town taking on responsibility.
South Burlington Fire Station	Cub Scouts 678 (Eric Bishop-vonWettberg)	Met with leaders and scouts in spring for a work day/orientation
South Burlington Library	Cub Scouts 678 (Eric Bishop-vonWettberg)	Met with leaders and scouts in spring for a work day/orientation

Table 2: 2019 Rain Garden Adopters

Volunteer Appreciation Event Summary

2018 Appreciation Event

- In March 2019, we hosted a volunteer appreciation event for the previous year's volunteers. All rain garden adopters and water quality monitors from the 2018 field season were invited. Three people attended. A tour of the Essex Junction Wastewater Treatment Facility was given by Chelsea Mandigo and the RRST coordinator discussed the results of the 2019 season.

2019 Appreciation Event

- In September 2019, we hosted a volunteer appreciation event at CSWD Materials Recycling Facility in Williston for 2019 field season volunteers. The event was attended by 11 people. The tour was led by Lauren Layn, a Stream Team volunteer who also works for CSWD. Attendees provided positive feedback noting that they enjoy educational appreciation events and also enjoyed the breakfast spread.

Figure 13: Volunteers tour the Essex Junction Wastewater Treatment Facility as part of the 2018 volunteer appreciation event. (3/20/19)

Figure 14: Volunteers enjoy breakfast and tour the CSWD Materials Recycling Facility as part of the 2019 volunteer appreciation event. (9/18/19)

RRST Estimated Impact by Municipality

The table below depicts an estimate of the number of individuals engaged in-person in each RRST municipality in 2019.

Town	# of people reached in-person in 2019
Burlington (Project)	78
Colchester (Outreach)	42
Town of Essex (Outreach)	18
Village of Essex Junction (Outreach)	67
Milton (Project)	10
Shelburne (Project)	163
Williston	28
South Burlington	43
Winooski	0
TOTAL	**449**

Table 3: Interaction with RRST by member town. Note that although no residents in Winooski were directly reached with programming this year, two storm drain murals are still highly visible in the city.

Appendix A: Clean Water Reading List

Rethink Runoff Stream Team Clean Water Reading List			
This list was developed by the Rethink Runoff Stream Team (RRST). RRST is a stormwater education campaign managed by the Chittenden County Regional Planning Commission and run by the Winooski Natural Resources Conservation District. RRST offers community outreach, volunteer opportunities, workshops, and events in the municipalities of: Burlington, Colchester, Essex, Essex Junction, Milton, Shelburne, South Burlington, Williston & Winooski. If you would like to use this list please display the following text "This list was created by Rethink Runoff Stream team in collaboration with the Lake Champlain Basin Program Resource Library." If you are located in one of the nine municipalities we serve we may be able to run a clean water workshop or activity hour for adults or kids for free and/or loan items to you (like water sampling vials and informational brochures) for a display. Contact kristen@winooskinrcd.org for more information.			
Title	**Author**	**Category**	**Source of Recommendation**
A Drop of Water	Walter Wick	Adult	LCBP Resource Library at Echo
Disconnected Rivers: Linking Rivers to Landscapes	Ellen Wohl	Adult	Brownell Librarians
In the Land of the Wild Onion: Travels Along Vermont's Winooski River	Charles Fish	Adult	LCBP Resource Library at Echo
Lake Champlain: A Natural History	Mike Winslow	Adult	LCBP Resource Library at Echo
One Life At A Time Please	Edward Abbey	Adult	Stream Team: James Sherard
Paddler's Guide to the Champlain Valley : Exploring the Rivers, Creeks, Wetland and Ponds	Margret Holden	Adult	Kristen Balschunat: Stream Team
Round River	Aldo Leopold	Adult	Stream Team: James Sherard
Snow Crystals	WA Bentley	Adult	LCBP Resource Library at Echo
The Art of Lake Champlain: Inspiring Landscape	Unknown	Adult	LCBP Resource Library at Echo
The Death & Life of the Great Lakes	Dan Egan	Adult	Stream Team: Chelsea Mandigo
The Water Between: A Photographic Celebration of Lake Champlain		Adult	LCBP Resource Library at Echo
Vernal Pools: Natural History and Conservation	Elizabeth A. Colburn	Adult	Brownell Librarians
Water: A Natural History	Alice Outwater	Adult	Stream Team: Tom DiPietro
Watersheds: A Practical Handbook for Healthy Water	Clive Dobson	Adult	LCBP Resource Library at Echo
Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont	Elizabeth H. Thompson	Adult	Stream Team: Kristen Balschunat

Around the Pond: Who's Been Here?	Lindsay Barrett George	Childrens	LCBP Resource Library at Echo
Champ and me by the Maple Tree	Ed Shankman	Childrens	LCBP Resource Library at Echo
Dwayne the Storm Drain	Mass. Water Professionals	Childrens	Stream Team: Chelsea Mandigo
From Raindrop to Tap	Michael Bright	Childrens	Brownell Librarians
Muskrat will be Swimming	Cheryl Savageau	Childrens	LCBP Resource Library at Echo
Over and Under the Pond	Kate Messner	Childrens	LCBP Resource Library at Echo
Racoon's Last Race	Joseph Bruchac and James Bruchac	Childrens	LCBP Resource Library at Echo
Song of the Water Boatman and Other Poems	Joyce Sidman	Childrens	LCBP Resource Library at Echo
Thirteen Moons on the Turtle's Back	Joseph Bruchac and Jonathan London	Childrens	LCBP Resource Library at Echo
Trout are Made of Trees	April Pulley Sayre	Childrens	LCBP Resource Library at Echo
Water: Up, Down, and All Around	Natalie M. Rosinsky	Childrens	LCBP Resource Library at Echo
Hatchet & The River	Gary Paulsen	Young Adult	Stream Team: James Sherard

2019 Water Quality Monitoring Interim Report

2/24/2020

2019 Stream Team Volunteers say “cheers” to clean water during the volunteer training day in June.

Report prepared by: Kristen Balschunat, Conservation Specialist
Winooski Natural Resources Conservation District

Funded by: LaRosa Partnership, VT Department of Environmental Conservation Watershed Management Division

Monitoring Team

The Rethink Runoff Stream Team (formerly the Chittenden County Stream Team) is a program that engages citizens across a nine-municipality region to implement projects that reduce nonpoint source pollution and stormwater volume at the local level. The participating municipalities are Burlington, Colchester, Essex, Essex Junction, Milton, Shelburne, South Burlington, Williston, and Winooski. The Water Quality Monitoring program is managed by the Chittenden County's Municipal Stormwater Separate System Committee, coordinated by the Winooski Natural Resources Conservation District, and made possible through the support of the Vermont Department of Environmental Conservation LaRosa program. This report describes the results from the 2019 collection season; the eighth, consecutive year data was collected by this volunteer-led stream water quality monitoring effort in Chittenden County.

When, Where, and What the Stream Team Monitors

The Rethink Runoff Stream Team (RRST) has collected biweekly water quality samples at several pollutant "impaired" or "stressed" stream sites in Chittenden County since 2012. These urban or suburban streams suffer from excessive nutrient loads, sodium chloride, sedimentation, high temperatures, bacteria, and/or other pollutants. Samples were collected on six different dates in 2019: on five, scheduled bi-weekly dates and on one "high-flow" dates (i.e. during a rain event). High-flow sampling provides a snapshot of the potentially, elevated or diluted pollutant-loads moving through these systems when it rains. Samples were analyzed for total phosphorus, and chloride at all 21 sites. The specific sampling sites and their locations are listed in Table 1 and a map of the sites is shown in Figure 1.

Biweekly sampling occurred on: June 25th, July 9th, July 23th, and August 6th and August 20th Rain event sampling or "high-flow"(freshet) sampling occurred on August 8th at sites on Indian, Muddy, Potash, Centennial and Morehouse brooks. Between August 7th and 8th 1.19 inches of rain fell overnight, therefore the sampling on August 8th is classified as a highflow event. All other biweekly sampling dates fell during dry conditions or base flow events.

Table 1. Rethink Runoff Stream Team 2019 Water Quality Sampling Sites

Stream	*Location*	*Site ID*	*Sampling Reason*	*Types of Samples*	*Lat / Long*
Centennial Brook	Grove Street in Burlington	Centennial 10	Long Term monitoring since 2012	TP, Chloride	44.48453, -73.18423
	Patchen Road in Burlington	Centennial 20	Monitoring since 2017	TP, Chloride	44.47402, -73.17334
Indian Brook	Essex High School	Indian 10	Long Term monitoring since 2012	TP, Chloride	44.49668, -73.11093
	Lang Farm in Essex	Indian 20	Long Term monitoring since 2012	TP, Chloride	44.50442, -73.09190
Malletts	McMullen Road	Malletts 10	Long Term monitoring since	TP,	44.60855,

Creek			2012	Chloride	-73.10693
Munroe Brook	Spear & Webster Intersection	Munroe 20	Monitor impact of new housing development upstream. Monitored since 2012	TP, Chloride, Turbidity	44.38984, -73.20103
Morehouse Brook	Landry Park Winooski - Pine Grove Terrace Branch	Morehouse PGT	Town of Winooski will install a detention pond this year. Monitor effectiveness.	TP, Chloride, Turbidity	44.50081, -73.194
	Landry Park - Industrial Park Branch	Morehouse IPB	Compare two branches of Morehouse brook	TP, Chloride, Turbidity	44.50015, -73.1937
Muddy Brook	River Cove Road in Williston	Muddy 10	Long Term monitoring since 2012	TP, Chloride	44.47293, -73.13505
	Exact location TBD	Muddy 20	Monitor effectiveness of new town easements in watershed	TP, Chloride	Needs scoping
	Van Sicklen Road in Williston	Muddy 30	Long Term monitoring since 2012	TP, Chloride	44.42823, -73.14622
Potash Brook	Kindness Court in South Burlington	Potash 10	Long Term monitoring since 2012	TP, Chloride	44.44572, -73.21348
	Farrell Street in South Burlington	Potash 20	Long Term monitoring since 2012	TP, Chloride	44.44660, -73.20415
	Dorset Street in South Burlington	Potash 30	Long Term monitoring since 2012	TP, Chloride	44.45150, -73.17849
Engelsby Brook	Pine St in Burlington	Engelsby 10	Long Term monitoring since 2012	TP, Chloride	44.45627, -73.21394
	Redstone Campus in Burlington	Engelsby 20	Monitoring since 2017	TP, Chloride	44.46654, -73.19741
Sunderland Brook	Pearl St Park in Essex Junction	Sunderland 10	Part of Town of Essex chloride Study	TP, Chloride	44.50179, -73.12983
	Just above Rte 2/7 culvert in Colchester	Sunderland 20	Part of Town of Essex chloride Study	TP, Chloride	44.51685, -73.20421
Sunnyside Brook	Near Hercules Rd. Colchester	Sunnyside 10	Brook impaired for chloride, awaiting TMDL	TP, Chloride	TBD

Winooski Natural Resources Conservation District

RETHINK RUNOFF

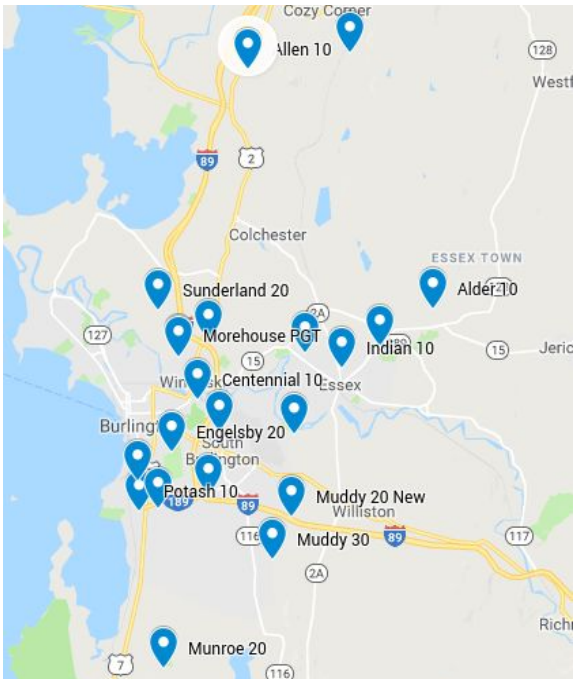
THE STREAM TEAM

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION

Allen Brook*	Milton	Allen 10	Currently NOT stormwater impaired. Will monitor for changes	TP, Chloride, Turbidity	TBD - needs scoping
Alder Brook	Off of Rte 289 in Essex	Alder 10	Part of Town of Essex chloride Study	TP, Chloride	44.51742, -73.06559

* Although we planned to sample on Allen Brook, our volunteer experienced issues accessing the site so we were not able to submit any samples to the lab. We will try to find a better site in 2020.

Figure 1: 2019 Rethink Runoff Stream Team Sample Sites



Sampling Summary

Altogether, samplers collected 200 field samples (100 phosphorus samples and 100 chloride samples). Additionally they collected ~20 duplicate samples and ~20 blank samples for data quality checking purposes. These duplicate and blank numbers represent 10% of the total sampling effort, aligning with the requirements in the QAPP and the guidance of the lab. The combined total resulted in **140** samples submitted to the lab.

Challenges

As of 2/24/2020 the Stream Team has not received quality checked data from the LaRosa Program and has therefore not been able to complete the analyses needed to write the 2019 Water Quality Sampling Final Report. As soon as the data is received we will work on analysis and report writing. We plan to use similar format and statistical analyses to those completed in the 2019 Water Quality Sampling Report.

STENCILS ONLINE LLC

Date: 05/17/2019 REP: KNS

Order Number: 546618499

File Name: Town of Colchester 02

Material: 10 mil Mylar

Ship Method: Best Way

Total # of Stencils for Order: 4

Image size: 26" x 12”
10 Mil
Qty 2

Image size: 26" x 14.5”
10 Mil
Qty 2

Thank you for your order!

STENCILS ONLINE WILL NOT BE RESPONSIBLE FOR ERRORS ONCE THE JOB HAS BEEN COMPLETED IN ACCORDANCE TO YOUR APPROVAL

* Template sizes: Unless otherwise stated, stencils longer than 40” *may* be cut into sections to make them more manageable. If you need your stencil to be on a single template, please let your custom stencil designer know **before** approving this proof.
Multi part stencils will be cut with registration marks for proper alignment.

Invoice

Stencils Online llc
70 Industrial Park Dr
Franklin, NH 03235

(603) 934-5034

Invoice Date	Invoice #
5/17/2019	546618499

Bill To
Town of Colchester - Public Works Karen Adams 781 Blakely Road Colchester, VT 05446

Ship To
Town of Colchester - Public Works Karen Adams 781 Blakely Road Colchester, VT 05446

P.O. Number	Terms	Rep
	Net 30	KNB

Ship Via	File
Best Way	T

Description	Customer File	Material	Quantity	Price Each	Amount
Stencils Online Quote: 52696, Product ID: 57726	Town of Colchester 02	10 mil	1	55.64	55.64
Duplicate stencil		10 mil	1	21.71	21.71
Stencils Online Quote: 52696, Product ID: 57727		10 mil	1	48.30	48.30
Duplicate stencil		10 mil	1	17.24	17.24
Ship Best Way			1	0.00	0.00

Total	$142.89

Green Up Day:
Total Materials Collected

TRASH (tons)

TOWN	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	AVG
Bolton	1.1	1.6	2.0	1.7	1.4	2.8	1.6	1.2	1.3	1.0	1.9	1.5	0.70	0.5	1.0	0.5	0.3	0.6	1.7	1.9	1.3
Burlington	5.2	3.1	3.6	2.9	6.0	6.1	6.4	5.6	3.7	6.9	3.8	3.0	4.05	2.7	2.1	4.1	0.0	1.5	0.3	1.6	3.6
Charlotte	2.5	1.6	2.3	3.0	2.4	2.3	2.5	1.8	2.6	1.6	1.3	1.9	2.51	1.9	2.8	1.6	1.8	1.5	1.6	1.6	2.1
Colchester	7.2	3.3	5.8	3.9	3.3	3.4	5.3	2.6	4.6	5.0	4.4	4.4	4.0	3.6	5.5	5.1	3.5	3.1	2.88	3.2	4.2
Essex Town	1.1	2.1	3.2	2.6	3.6	2.6	4.4	3.6	2.2	2.3	0.9	3.5	1.9	12.4	4.2	2.6	1.9	1.7	2.36	2.6	3.1
Essex Junction	0.5	0.6	0.8	1.3	1.1	0.7	0.6	0.4	0.7	0.9	1.7	0.9	0.1	0.3	0.9	0.6	0.5	0.6	0.51	0.7	0.7
Hinesburg	2.8	2.3	4.0	4.2	3.2	2.8	3.2	3.3	2.7	2.5	1.8	2.4	2.1	1.4	2.9	1.8	2.0	1.8	5.71	2.9	2.8
Huntington	0.9	0.9	1.7	1.1	0.8	1.1	0.7	1.1	2.2	0.7	0.0	1.2	0.6	0.6	1.0	0.8	1.0	0.5	0.79	1.2	0.9
Jericho	2.8	0.7	1.4	1.1	1.6	1.7	1.7	2.5	1.8	1.6	1.7	1.1	1.1	1.0	1.4	1.3	1.1	1.5	1.56	1.1	1.5
Milton	4.6	4.1	8.0	2.0	5.6	5.1	4.4	3.1	2.6	4.9	2.9	2.8	2.6	2.3	0.7	2.9	0.0	2.4	0.00	3.6	3.2
Richmond	2.7	2.3	2.6	2.1	2.1	2.7	2.2	3.3	2.0	3.2	1.9	2.9	2.0	1.7	2.3	1.4	1.1	1.9	1.89	1.8	2.2
Shelburne	0.6	0.7	0.4	0.8	0.9	1.1	0.8	1.1	0.8	0.6	0.4	0.5	0.5	0.4	0.8	0.7	0.6	0.4	0.61	0.8	0.7
South Burlington	0.3	0.1	1.5	1.0	1.3	1.3	1.7	0.7	1.4	2.5	2.8	6.1	3.3	2.5	4.5	2.3	1.7	1.7	0.64	1.8	2.0
St. George	0.3	0.3	0.7	0.2	0.3	0.4	0.5	0.6	0.4	0.1	0.1	0.0	0.0	0.0	0.6	0.0	0.0	0.2	0.22	0.0	0.2
Underhill	n/a	n/a	n/a	n/a	1.4	1.3	0.7	1.0	0.5	0.4	0.7	0.4	0.6	0.5	0.6	0.4	0.4	0.6	0.50	0.4	0.6
Westford	3.8	0.6	1.1	0.7	1.9	4.0	2.0	1.0	2.6	1.4	1.2	1.1	0.6	0.8	1.0	1.1	0.5	0.9	0.00	0.0	1.3
Williston	2.3	2.2	1.9	2.2	2.4	1.4	1.7	1.7	1.6	1.6	1.1	1.4	3.0	1.5	2.8	1.6	1.3	1.9	2.11	2.7	1.9
Winooski	10.9	6.0	1.2	2.1	2.1	2.1	0.3	0.6	3.2	1.5	1.2	3.0	2.8	2.1	1.6	0.8	1.2	2.0	0.00	0.0	2.2
State Highway	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.7	0.8	1.0	0.5	0.0	0.7	0.5	1.7	2.0	1.5	2.4	0.00	1.9	0.7
TOTALS	49.7	32.5	42.0	33.0	41.4	42.8	41.7	35.9	37.6	39.5	30.3	38.1	33.2	36.5	38.0	31.7	20.3	27.0	23.38	29.8	35.2

TIRES (converted from tons at an average of 93 tires/ton)

TOWN	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019.0	AVG
Bolton	85	155	86	185	87	0	172	125	80	167	51	90	134	75	125	49	56	39	339	358	10
Burlington	81	166	71	241	70	176	53	34	240	249	134	91	102	0	18	0	139	0	0	0	93
Charlotte	59	47	87	65	47	107	94	64	96	80	51	119	157	142	143	275	276	241	284	302	137
Colchester	410	215	345	242	325	201	303	165	332	291	189	132	321	285	233	275	241	277	216	509	275
Essex Town	49	52	160	116	55	8	211	2	97	115	35	145	383	192	215	81	109	102	96	168	120
Essex Junction	2	7	11	33	2	3	113	220	3	48	21	14	0	8	10	3	0	13	3	13	26
Hinesburg	331	373	193	100	105	110	97	155	251	119	100	51	75	142	93	101	247	81	426	178	166
Huntington	111	30	150	37	19	37	36	103	85	100	24	31	52	54	52	19	26	8	20	18	51
Jericho	54	48	93	4	61	35	47	74	66	74	49	83	39	39	73	64	6	34	63	42	52
Milton	660	150	0	180	178	198	124	187	195	270	177	189	0	167	300	181	218	187	153	179	195
Richmond	109	60	81	75	243	36	88	64	165	73	64	79	159	154	273	209	213	179	166	178	133
Shelburne	16	13	19	11	84	125	60	165	61	78	82	147	147	59	133	119	153	114	95	268	97
South Burlington	0	20	18	3	18	127	6	19	57	107	162	46	2	62	182	137	137	171	334	291	95
St. George	2	16	14	5	0	10	0	0	9	14	0	0	0	0	0	0	0	0	0	0	4
Underhill	n/a	n/a	n/a	n/a	10	98	92	134	156	238	33	60	208	66	140	117	87	103	98	88	108
Westford	637	127	17	74	32	0	0	135	208	101	97	187	0	208	118	161	0	0	0	50	108
Williston	17	31	105	32	36	63	33	10	52	41	87	5	212	45	136	25	12	10	47	61	53
Winooski	17	18	5	18	13	0	0	1	4	9	12	10	73	67	51	0	149	0	0	0	22
State Highway	0	0	0	0	0	0	212	97	177	37	336	299	270	461	353	442	556	327	644	494	235
TOTALS	2,640	1,528	1,455	1,421	1,385	1,334	1,741	1,754	2,335	2,212	1,703	1,778	2,335	2,227	2,648	2,258	2,625	1,887	2,981	3,197	2,072

METAL (cubic yards)

TOWN	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	AVG
Bolton	0.0	0.0	0.0	d/k	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Burlington	5.5	14.0	5.5	3.4	11.3	4.0	6.0	0.0	0.0	0.0	4.0	0.5	0.1	0.0	1.5	0.0	0.0	0.0	0.0	0.0	2.8
Charlotte	4.0	5.0	3.5	6.0	8.0	1.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
Colchester	0.0	0.0	1.0	8.0	0.5	0.0	5.0	2.0	1.0	3.3	0.0	0.1	0.0	2.5	3.5	2.0	3.4	0.0	0.0	0.0	1.6
Essex Town	2.0	7.0	9.0	7.0	4.5	6.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
Essex Junction	1.0	0.5	1.0	0.5	1.0	0.0	0.0	2.0	0.3	1.0	0.0	0.5	0.0	0.5	1.0	0.0	0.0	0.5	0.0	0.0	0.5
Hinesburg	6.3	7.0	6.5	7.0	7.0	3.0	5.0	4.0	2.0	2.0	2.8	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7
Huntington	8.0	6.0	9.5	0.0	4.0	2.0	1.0	1.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
Jericho	6.0	7.0	6.5	1.0	5.0	5.0	4.3	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9
Milton	0.0	0.0	0.0	12.0	3.0	3.2	5.0	7.0	2.0	4.0	1.8	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Richmond	0.0	0.0	3.5	0.0	0.0	0.0	1.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Shelburne	0.3	1.0	3.5	1.0	0.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
South Burlington	0.0	0.5	3.5	1.0	0.5	2.0	0.0	2.0	1.0	6.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
St. George	2.5	3.0	0.0	1.0	0.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Underhill	n/a	n/a	n/a	n/a	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Westford	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Williston	2.5	5.0	3.5	3.5	1.3	1.5	0.5	0.3	0.1	1.5	0.0	0.2	0.0	0.0	0.5	1.5	0.3	0.0	0.0	0.0	1.1
Winooski	0.0	0.0	28.6	10.7	d/k	0.0	0.5	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3
State Highway	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
TOTALS	38.1	56.0	85.1	62.1	69.6	34.7	28.3	20.6	17.4	17.8	23.9	3.3	1.0	3.0	6.5	3.5	3.7	0.5	0.0	0.0	23.7

Colchester Conservation Commission

Theresa Carroll, Chair

"Dedicated to protecting water quality and natural communities."

In FY 2018-19, the Conservation Commission:

- Partnered with Claussen's Florist, Greenhouse and Perennial Farm to offer a pollinator workshop led by Jane Sorensen, owner of River Berry Farm in Fairfax; fourteen participated
- Organized Green Up Day on May 4, an event that attracted 955 volunteers (including 500 students) who picked up 3.2 tons of trash and 509 tires
- For the tenth consecutive year, through Colchester Blooms!, planted flowers at Bayside Park, the flagpole bed near The Pickled Perch and the traffic islands across from Malletts Bay School; a total of 39 volunteer hours in planting and end-of-season clean-up of flower beds (photo below left)
- Participated in a Lake Champlain Sea Grant Program excursion on the University of Vermont research vessel, the R/V *Melosira*; focus was on the geology, invasive species, history and other aspects of Lake Champlain
- Asked by the Town to help develop an emerald ash borer preparedness management plan
- Visited Law Island to survey the perimeter trail and campsites to prepare a report for the Lake Champlain Land Trust (photo below right)
- Conducted site visits to Gilbrook Natural Area and Wolcott Family Natural Area
- Attended the annual Chittenden County Regional Conservation Commission meeting, which provided a forum to network, address natural resources-related concerns and share activities with other town commissions and local and state agencies

MS4 Annual Report Attachments – MM3

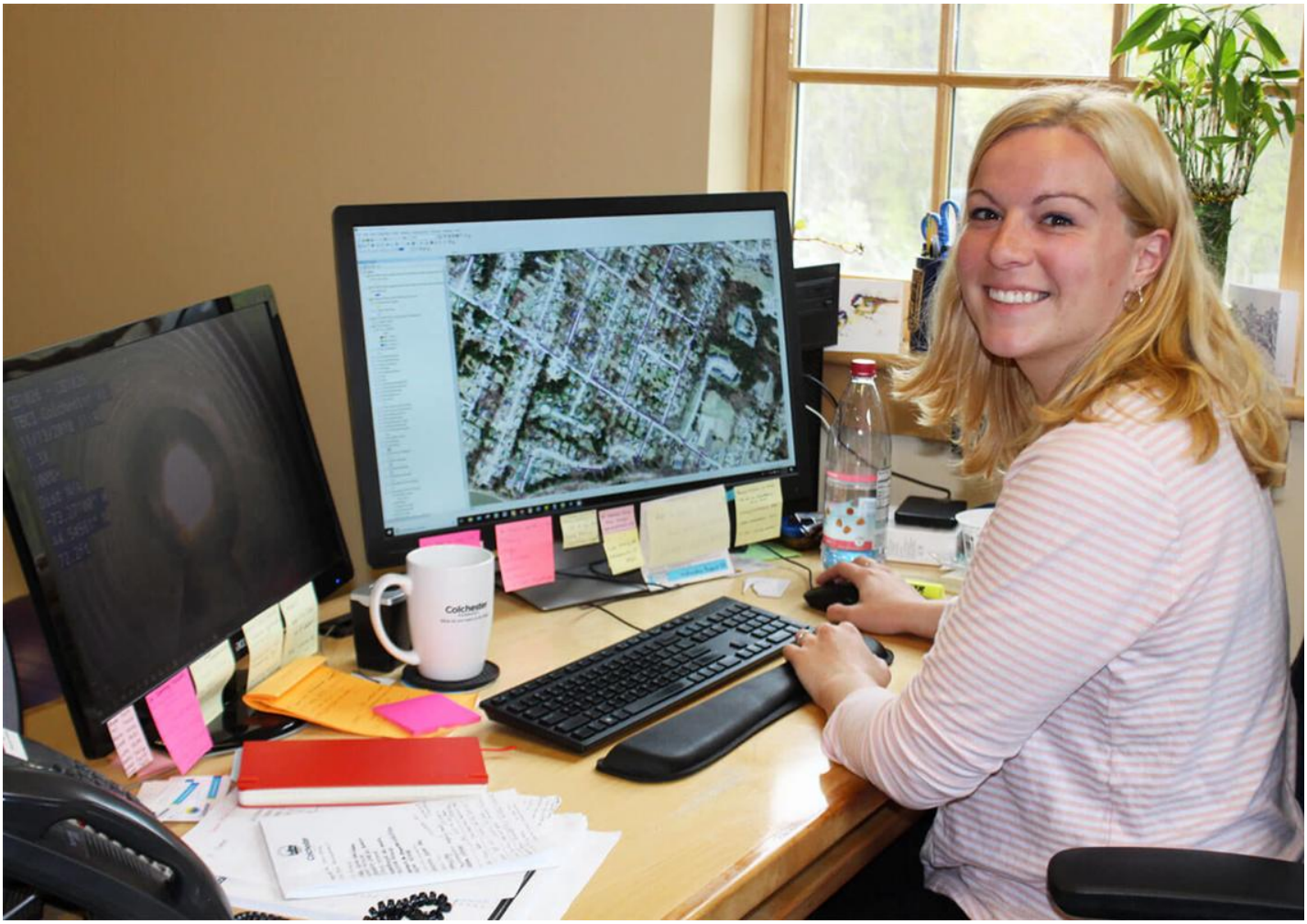
- Colchester Sun Article on Townwide Stormwater Condition Assessment
- 2019 IDDE Sampling Report

https://www.colchestersun.com/news/town-peeks-into-its-pipes/article_928139c4-5074-539f-a2f1-f1a4ef0f3677.html

Town peeks into its pipes

Two years ago, Colchester created a stormwater utility to focus funding and efforts to manage stormwater flowing into Malletts Bay and its tributaries. Stormwater carries pollutants into Lake Champlain, including phosphorous and other chemicals. On Tuesday, the town will learn the results of the utility's first major undertaking – a look underground at the pipes [...]

By Avalon Ashley
May 22, 2019



Stormwater Director Karen Adams looks through footage from the stormwater utility project's pipe cameras.

Two years ago, Colchester created a stormwater utility to focus funding and efforts to manage stormwater flowing into Malletts Bay and its tributaries. Stormwater carries pollutants into Lake Champlain, including phosphorous and other chemicals.

On Tuesday, the town will learn the results of the utility's first major undertaking – a look underground at the pipes which carry stormwater.

The utility, which is the main vehicle for meeting requirements under the town's Municipal Separate Storm Sewer System (MS4) permit, is also launching a new program to help homeowners manage stormwater on their property and has been involved in educating students in Colchester's schools about stormwater.

The town assessed 21.4 miles of pipes at a cost of $160,000 and was 80 percent grant-funded, while the 20 percent local match was taken out of the stormwater utility fee fund. A zoom camera was used to inspect each pipe, supplying information on structural condition and whether or not the pipes need to be replaced.

As the assessment comes to a close, the town's next step will be discerning what kind of work lies ahead. "We will present on the condition assessment and go from there—figure out what's next on the pipeline," said Karen Adams, Technical Services Manager and Stormwater Director at Colchester Public Works. "If you will," she laughed softly—a quality water pun.

"We want to see, does it still have useful life?" said Adams. Many of the pipes were put in place during the 50's and 60's and are made of metal, meaning many are nearing the end of their lives. Plastic piping, popularized in the 80's, is more weather-flexible and lasts longer than metal.

"One of the challenges is that we're heavily invested in the current infrastructure," said Adams, on whether it's possible to replace the metal system with plastic. "We have to create something that works together with the current system; package things together."

“Since the pipes are under roads,” said Adams, “we want to be proactive—not just responding in emergency situations.”

She and Public Works Director Bryan Osborne were pleasantly surprised at the results from the footage, noting that while some of the pipes require light maintenance, only a few needed an emergency fix.

“This is the first look inside the pipes since installation,” said Osborne. Navigating between the old and new systems is about “thinking creatively and being opportunistic,” he said.

The current plan is to assess conditions of stormwater management systems, prepare a five year capital plan and budget, and then re-video the pipes in five years.

Education and Outreach

Another project in the works is the town’s partnership with a residential retrofit program called the Blue Stormwater Certificate program. According to the town website, the program “helps residents identify projects that are appropriate for reducing the impact of stormwater runoff on your property.”

After implementing projects like a rain garden, a dry well system, or a gutter downspout, residents become eligible for a credit of up to $200 that goes towards their annual stormwater fee.

In 2017, the town adopted a new stormwater utility system to better address water quality in the town. This changed the program from property tax funded to a per-parcel fee, which is the same for every residential property-owner and varies according to size for commercial properties. Since many large properties don’t pay property taxes, they were exempt from contributing to stormwater management funds in the previous system, despite contributing largely to stormwater and phosphorus pollution. The

new stormwater utility bypasses that loophole and enhances the amount of funds available for water quality management. According to Osbourne, the changes have brought in an extra $300,000 from large, commercial properties that were previously exempt.

"If we can have folks manage their stormwater contribution on their own, we are free to put our resources to other projects and more ways to manage stormwater efficiently," Osborne said.

Commercial property owners are not eligible to partake in the Blue program, but they can qualify for tax credits. "If they have a financial rebate, they're more inclined to implement practices that alleviate waste and stormwater on their own," said Adams.

The Blue program started out with a maximum of 20 applicants, but Adams said they've seen at least 25 interested homeowners. "We're currently looking for ways to expand the program," said Adams.

The evaluation includes a Blue representative going to the property, and talking to the homeowner about their property's place in the watershed—"Everything from flooding, erosion, if they use fertilizer with phosphorous, to where they wash their car," said Adams. "We're lucky that a lot of our folks are in tune with stormwater. A lot of people already have a rain garden, a rain barrel, a swale, etc."

Colchester resident Chris Poplawski was one of the first to sign up for Blue. "I've learned a couple of things that I didn't know but for the most part, my property is in really good condition," he said.

Poplawski has a small rain garden already but some of the things that the Blue representative suggested were not to use any fertilizer, and to let the grass grow over three inches. "This helps grass grow in dry spells, and the roots go down deeper," said Poplawski, which helps to soak up phosphorous.

Poplawski's knowledge of stormwater has accumulated over time and through experience working for Burlington Public Works, but he signed up because he wanted to know more. "We have a beach that we swim in and we'd like see it as clean as possible; try to leave the resource for future generations," he said.

A rain garden is one of many ways that residents can manage their own stormwater output, instead of funneling phosphorus, fertilizer, oil, feces, and other pollutants into Lake Champlain. But not all stormwater can be contained in a garden. Other solutions for managing stormwater include rain barrels, swales or berms, and phosphorus-free fertilizer.

The Colchester Public Works offices have a rain garden of their own, in a space where the ground naturally slopes to collect runoff. Adams said she eats her lunch in the garden when it's sunny outside.

Part of the town's MS4 permit requires public outreach and education. "Blue is also a great way to educate people," said Adams.

Adams and Osborne are also looking to the future generations. "When we first started, the initial target audience was the homeowner—but that has evolved," said Adams.

Osborne hopes to get to a place where stormwater quality is as commonplace as recycling. "Kids recognize that symbol, they know what that means," he said.

The town is also part of Rethink Runoff, a regional group of nine communities that all have MS4 permits, including University of Vermont and VTrans. "Nine times the budget, nine times the outreach," said Adams. The group does surveys, ads, and outreach to schools.

One of the ways in which the town reaches out to young people is through tax credits to schools if they teach a water quality curriculum.

Last year, Adams went on a field trip with some students from Colchester High School to stencil water quality symbols at different storm management systems around town. Stencils featured Champ, the well-loved lake monster, and the words, "Drains to Champlain."

2019

Location	ID#	Date	Flow	pH	E.Coli	Notes
Lexington Road	6 / CP1397	9/22	YES	7.6	79	Coloration
112 Wyndham Road	7 / CP1399	9/22	YES	7.4	44	Tire debris
Coventry Road	8 / CP1398	9/22	NO	7.2		Small debris
196 Liberty Lane	11 / CP1402	9/22	YES	7.4	160	Suds
122 Foreman Drive	18 / CP1428	9/22	NO	7.2		Bank erosion
12 Woodrose	5 / OC1483	9/22	Dry			Low vegetation (wildflowers)
Severance Road	48 / CP1391	9/22	Dry			Lawn waste
Young Street		9/22	Dry			Yard waste
Opposite International Sail	B3-016	9/22	Dry			Debris (including a tire)
Between Moorings & Shore	B3-017	9/22	Dry			Heavy vegetation
Moorings Baffle Box	B3-018	9/22	NO	7.8		Heavy scum
1086 E. Lakeshore Drive	C2-001	9/22	Dry			Mild sand erosion
1063 E. Lakeshore Drive	C2-002	9/22	Dry			Mild sand erosion
E, Lakeshore Drive	C2-003	9/22	NO			Lake above concrete outlet
1277 E. Lakeshore Drive	C2-004	9/22	Dry			NEEDS EXTENSION PIPE
Lefevre's	C2-005	9/22	Dry			Good shape
230 Stone Drive	C2-006	9/22	Dry			Very low
230 Stone Drive	C2-007	9/22	Dry			Heavy vegetation
Tower Ridge	C3-002	9/22	Dry			Moderate vegetation
Everbreeze	C3-003	9/22	Light	7.2	0.9	Pipe now repaired
Blakely Road	C3-004	9/22	NO	7.2		Lowest in my term
Opposite Williams Road	C3-005	9/22	YES	7.2	0.9	No outlet
Opposite Williams Road	C3-006	9/22	NO	7.2		Good shape
Acorn Lane - Upper	C3-018	9/22	SITE GONE - NEW DRIVEWAY COVERED IT			
Acorn Lane - Lower	C3-019	9/22	YES	7.6	20	Good shape
Champlain Drive	C3-021	9/22	Dry			Rik-rak sliding
118 Orchard Drive	C3-025	9/22	Dry			Good shape
Route 2 & 7 (Shaws)	C4-015	9/22	Dry			Bank deterioration
Shaw's 1	C4-017	9/22	Dry			Heavy vegetation
Hampton Inn / I89 Ramp	C4-018	9/22	Dry			Heavy vegetation
Shaw's 2	C4-019	9/22	Dry			Heavy vegetation
Main Street	D3-010	9/22	Dry			Both outlets dry
Fort Ethan Allen	D4-001	9/22	Dry			Lawn waste & trash
Fort Ethan Allen	D4-003	9/22	YES	7.4	23	Flow out of bank

MS4 Annual Report Attachments – MM5

- Memo from Planning & Zoning Documenting projects with more than 1 acre of land disturbance in 2019, the number of total permits issued, and the number of inspections performed

Colchester
VERMONT

781 Blakely Road • Colchester, Vermont • 05446 • 802.264.5500

www.colchestervt.gov

MEMORANDUM

TO: Karen Adams, Technical Services Manager
FROM: Sarah Hadd, Director of Planning & Zoning
DATE: February 21, 2020
RE: Stormwater Reporting Calendar Year 2019

Please find attached a spreadsheet enumerating projects advanced to construction for the period January 1, 2019 through December 31, 2019 with more than an acre of land disturbance. In calendar year 2019, the Department issued in total 672 permits and conducted 878 inspections (excluding certificates of occupancy and violation investigations).

Should you need any additional information, including copies of the individual permits, please feel free to contact me directly.

Colchester Projects, Under Construction as of December 2019 over 1 acre

Colchester Planning Zoning Department Monthly Report

Status of Approved Residential Projects for December 2019 (FY2020)

Project	Units Const./Remaining Units	Location	Contact	Acreage Disturbed	Project Acreage	Lot Coverage	Status
Projects Under Construction							
Wheelock	6 units	3555 Roosevelt Highway, tax map 27, parcel 16	Wilder Wheelock	1 to 5 ac.	3.51	Up to 20%	Under Construction
Hergenrother	2/12 units	Map 35 Parcel 1 521 River Rd	Hergenrother Const.	1 to 5 ac.	6.83	Up to 20%	Under Construction
Bean, Derek	2/4 lots	Jasper Mine Rd., tax map 16, parcel 32-4	Derek Bean	1 to 5 ac.	3.56	Up to 20%	Under Construction
Severance Corners Village LLC	29 units	2588 Blakely Road, tax map 08, parcel 37-1	Severance Corners Village	1 to 5 ac.	32	72.00%	Completed
Lomatire	12/49 unit PUD (23 sf & 13 duplexes)	Tax Map 6, Parcel 5, 634 Malletts Bay Rd	Rivers Edge Building	over 5 ac.	48	Up to 20% each	Under Construction
Mele	2/4 new units (1 prexisting)	422 Malletts Bay Avenue, Tax Map 6, Parcel 9 and 9-1	O'Leary - Burke Civil Assoc.	5 ac.	82	Up to 20%	Under Construction
Brigante Living Trust	28/45 units	239 Malletts Bay Avenue, Tax Map 6, Parcel 8	O'Leary - Burke Civil Assoc.	More than 5 ac.	25.23	Up to 20% for each lot	Under Construction
Gintoff, Hank	6/8 units	East Lakeshore Drive, tax map 66, parcel 16-1	Gintoff, Hank	1 to 5 ac.	3.03	1.06	Under Construction
Spruce Hill Farm LLC	4/5 lots	1751 East Road, Tax Map 12, Parcel 26	Fitzgerald Construction	More than 5 ac.	88.15	Up to 30% each lot	Under Construction

Colchester Projects, Under Construction as of December 2019 over 1 acre

Colchester Planning Zoning Department Monthly Report

Status of Approved Residential Projects for December 2019 (FY2020)

Project	Units Const./Remaining Units	Location	Contact	Acreage Disturbed	Project Acreage	Lot Coverage	Status
Blum	1/4 units	2825 Malletts Bay Avenue, tax map 28, parcel 79	Krebs & Lansing Engineers	less than 1 ac.	1.65	Up to 20%	Under Construction
Brooker, J.	3/6 units	Jen Barry Lane, Tax Map 47, Parcel 001012	O'Leary - Burke Civil Assoc.	1 to 5 ac.	4.36	Up to 20% for each lot	Under Construction
Powell	1/3 new lots	133 and 354 Platt Road, Tax Map 78, Parcel 19 and Tax Map 77, Parcel 2	John Powell	>5	22	Up to 20% for each lot	Under Construction
Barry, Bruce	1/7 lots	Jen Barry Lane, Tax Map 47, Parcel 1	David Burke	More than 5 ac.	28.1	Up to 30% for seven of the lots	Under Construction
Powell	1/3 new lots	133 and 354 Platt Road, Tax Map 78, Parcel 19 and Tax Map 77, Parcel 2	John Powell	>5	22	Up to 20% for each lot	Under Construction
Marble Island	56/76 units completed	Tax Map 57 Parcel 9	J.L. Davis Realty	over 5 ac.	61.47	Up to 60%	Dev. Under construction

MS4 Annual Report Attachments – MM6

- Staff Training Hours
- Report on Catch Basin Cleaning & Street Sweeping in 2019
- Invoice for Pumpout of Septic System at Airport Park Bathhouse

Road Salt Education Workshop
October 24, 2019
Sign-In Sheet

Name	Email	Phone
[illegible]		802-578 5325
Rick Wilson		802 878-1239
Shane Lawrence		802-349-4820
Trevor Gingras		802 373 3137
John W Johnson		802-431-8684
Etienne Touka		802 373 9063
MARK Russell		802 373 6003
John [illegible]		802 578 4822
MARK BILODEAU		802 578 8117
David Vanet		802 730-5426
Carl von Stritzky		802 922-0687
Justin Allen		802 793 2593
LST Peter Colchester		802 922-6711
Bob Miller ESSEX		878 1346
Jason Bathalon		802 3451228
Jason Wimble		802 578 7251
Pete Carpender		802 355-3098
Jonathon Beatty		(802)734 4208
Nate [illegible]		802 286-5725
ERIC GALLOS		
Keith Spalding		
BRIAN BIGELOW		899 4434
Fred Woolf		956-0783
Steve Dupuy		683-7886
[illegible]		658-7961
TODD GRESIAK		6587961
Jim [illegible]		490-6140

JEFF THEUS

Certificate of Completion

This is to certify that

Warner Rackley

Attended NPCA's Web Seminar

Integrating New Technologies in

Bridge Construction

August 27, 2019

Earning: 2.0 PDH Hours

Ty Gable, President
National Precast Concrete Association
1320 City Center Drive, Suite 200
Carmel, IN 46032
(800) 366-7731

NPCA
Precast ... The Concrete Solution

civil + structural
ENGINEER

CERTIFICATE OF COMPLETION

This is to certify that

Warner Rackley

participated in

Presto Geosystems Managing Stormwater through LID & GI

ZG053019
Tuesday, June 10, 2019
1 Learning Unit Hours

Richard Massey
Editor-in-Chief, Civil + Structural Engineer, Zweig Group

Beth Brooks
Director of Sales, Zweig Group

Zweig Group is an Approved Provider by the AIA, ACEC, and SMPS.

civil + structural
ENGINEER

CERTIFICATE OF COMPLETION

This is to certify that

Warner Rackley

participated in

Un-complicating the Stabilization Selection Process

ZG11062019CS

Date

1 PDH

Richard Massey

Editor-in-Chief, Civil + Structural Engineer, Zweig Group

Beth Brooks

Director of Sales, Zweig Group

Zweig Group is an Approved Provider by the AIA, ACEC, and SMPS.

civil + structural
ENGINEER

CERTIFICATE OF COMPLETION

This is to certify that

Warner C. Rackley

participated in

Un-Complicating the Stabilization Process Part II

ZG12132019CS

Date

1 PDH

Christy Zweig

Media Director, Civil + Structural Engineer

Jaden Anderson

Media Account Executive, Civil + Strutural Engineer

Zweig Group is an Approved Provider by the AIA, ACEC, and SMPS.

FORESTER UNIVERSITY

certifies that

Warner Rackley

has earned 0.1 Continuing Education Unit (CEU)
or 1.0 Professional Development Hour (PDH)
by successfully completing

Stormwater Goes Green: The Benefit and Health of Trees in Green Stormwater Infrastructure

Presented by Andrew Tirpak

Santa Barbara, California
1/29/2019

John Pasini,
Executive Director, Events & Education

FORESTERUNIVERSITY

Forester University • 2946 De La Vina Street • Santa Barbara CA 93105

FORESTER UNIVERSITY

certifies that

Warner Rackley

has earned 0.1 Continuing Education Unit (CEU)
or 1.0 Professional Development Hour (PDH)
by successfully completing

Using SARA Modeling Tools in Water-Quality Management

Presented by Steve Graham, Dr. Sheeba Thomas, & Dr. Yu-Chun Su

Santa Barbara, California
2/19/2019

John Pasini,
Executive Director, Events & Education

FORESTERUNIVERSITY
Forester University • 2946 De La Vina Street • Santa Barbara CA 93105

SPRING webinar FEST

Warner Rackley

Is awarded 1.0 Professional Development Hour
For the successful completion of the Storm Water Solutions webinar:

Green Infrastructure Plant Selection

April 25th, 2019

Facilitator:
Robin Pasteur
Publisher
Storm Water Solutions
Arlington Heights, IL 60005

1 Hour Webinar
1 PDH
0.1 CEU

SPRING webinar FEST

Warner Rackley

Is awarded 1.0 Professional Development Hour
For the successful completion of the Storm Water Solutions webinar:

Master Planning for Watershed & Stream Health

April 23rd, 2019

Facilitator:
Robin Pasteur
Publisher
Storm Water Solutions
Arlington Heights, IL 60005

1 Hour Webinar
1 PDH
0.1 CEU

SPRING webinar FEST

Warner Rackley

Is awarded 1.0 Professional Development Hour
For the successful completion of the Storm Water Solutions webinar:

Protect Stormwater Channels with 3D Geocell Technology

April 23rd, 2019

Facilitator:
Robin Pasteur
Publisher
Storm Water Solutions
Arlington Heights, IL 60005

1 Hour Webinar
1 PDH
0.1 CEU

CERTIFICATE

PROUDLY PRESENTED TO

Warner Rackley

1 PDH: The 5-Steps to Managing a Successful Stormwater Planned Maintenance Program

Apr 4, 2019	*Andrew Demers*
Date of Completion	Organizer

StormwaterONE.com
Online Training & Credentials

Warner Rackley

From: John Bolton <noreply@tensarcorp.com>
Sent: Thursday, August 22, 2019 1:27 PM
To: Warner Rackley
Subject: Warner, your PDH Certificate is enclosed for Walls & Solutions - Temporary Walls & Pressure Relief Walls

CERTIFICATE OF PROFESSIONAL DEVELOPMENT HOURS

This certificate is presented to:

Warner Rackley

for attending the Walls & Slopes Solutions: Temporary Walls & Pressure Relief Walls Webinar on August 21, 2019.

Your attendance means you are taking an active role in the development and recommended practices for mechanically stabilized earth (MSE) applications. One (1) credit hour was incurred in topics related to Temporary walls (purposes related to construction sequencing and expediency, including temporary access ramps, bridge abutments, and support of earthwork) and Pressure relief walls that offer significant savings on structures which have large areas below grade, permitting more efficient construction.

1 (One) Professional Development Hour (PDH) Credited Earned

Bryan Gee
Director of Education & Training
Tensar International Corporation

**Attendees are responsible for determining the acceptability of this program for professional development licensure requirements. The State Board shall be the final authority with respect to whether a course or activity meets the requirements of this rule. Attendees residing in Florid and New York may reques PDH formatted to state specifications via email at marketingops@tensarcorp.com.*

Hello Warner,

Thank you for taking advantage of our monthly webinar series. This month's session was Walls & Slope Solutions - Temporary Walls and Pressure Relief Walls. We hope you found the webinar informative, educational and time well spent! The Professional Development Hours (PDH) Certificate for your participation is shown above.

After today's session, you may be interested in talking to your local Tensar representative to learn more about ways we can help on current and/or upcoming projects. To do so, please complete the Request a complimentary project review form.

In addition, Tensar has developed an online Educational Portal where you can earn additional PDH credits while learning more about using geogrid on all types of site work projects.

Below is a copy of the recorded session if you would like to reference it again or in the future, along with a link to today's session slides.

SPRING webinar FEST

Warner Rackley

Is awarded 1.0 Professional Development Hour
For the successful completion of the Storm Water Solutions webinar:

Urban Green Infrastructure on I-95: The University Research Monitoring Program

April 25th, 2019

Facilitator:
Robin Pasteur
Publisher
Storm Water Solutions
Arlington Heights, IL 60005

1 Hour Webinar
1 PDH
0.1 CEU

CERTIFICATE

PROUDLY PRESENTED TO

Warner Rackley

1-PDH: Urban Hydrology and Green Stormwater Infrastructure

Jun 27, 2019	*Andrew Demers*
Date of Completion	Organizer

StormwaterONE.com
Online Training & Credentials

civil + structural
ENGINEER

CERTIFICATE OF COMPLETION

This is to certify that

Warner Rackley

participated in

Pyrawall - The Most Durable Vegetated Wall Solution

ZG053019
Thursday, May 30, 2019
1 Learning Unit Hours

Richard Massey
Editor-in-Chief, Civil + Structural Engineer, Zweig Group

Beth Brooks
Director of Sales, Zweig Group

Zweig Group is an Approved Provider by the AIA, ACEC, and SMPS.

INFORMED INFRASTRUCTURE

The *construction engineer's* source for projects, products and technology

Profile

Solutions for your Environment

Certificate of Completion

This is to certify that

Warner Rackley

participated in the webcast:

NEW Tools for Comprehensive Erosion Control and Revegetation Specifications

Thursday, March 14, 2019
Course ID: Web03142019

1.0 Professional Development Hours

Shannon Burnett
Operations & Marketing Manager
V1 Media

SBurnett

V1 Media is an approved provider in the American Institute of Architects (AIA) Continuing Education System
AIA Provider Number: 70118112

Certificate of Attendance

1.5 Hours of Instruction

U.S. EPA Joint Water Research and Tools and Resources Webinar

Cyanobacteria Assessment Network Mobile Application (CyAN App) Training Webinar

July 25, 2019

Karen Adams

This certificate represents participation in the webinar named above. This webinar was a joint training effort between *U.S. EPA's Water Research Bimonthly Webinar Series and Monthly Tools and Resources Webinar Series*. The participant named above attended the webinar and met the participation requirements to receive one and a half hours of instruction.

Michelle L. Latham
Water Research Webinar Series Coordinator
Immediate Office of the Assistant Administrator
U.S. EPA Office of Research and Development

Lisa S. Matthews
Tools and Resources Webinar Series Coordinator
Immediate Office of the Assistant Administrator
U.S. EPA Office of Research and Development

Town of Colchester
Department of Public Works

Memo

To: Amanda Clayton, Town Engineer

From: Randy Alemy, Operations Manager

Cc: Karen Adams, Technical Services Manager

Date: February 13, 2020

Re: MS4 Permit information

We currently have 314 catch basins and 58 outfalls associated with 35 Stormwater Permits that are inspected at least annually.

Catch basin cleanings totaled approximately 15.5 cubic yards of material from approximately 50 catch basins, and the town collected approximately 282 cubic yards of street sweepings last spring and approximately 40 cubic yards of leaf debris in the fall.

Invoice

P&P Septic Service
P.O. Box 639
Williston, VT 05495
802-658-6243
dispatch@pandpseptic.com

RECEIVED JUN 26 2019

Date	Invoice #
6/22/19	T-517257

Customer:

Town Of Colchester
781 Blakely Rd
Colchester VT 05446

Service Site:

Town Of Colchester
Airport Park
Colchester VT 05446

WO #	Delivery Ticket #	Customer #	Customer Phone #	PO #	Terms
28286		135825	654-0727		NET5

Work description

Responded to an emergency sewer backup, pumped out septic tank and found line was still clogged between septic tank and bathhouse, pulled toilet and augered sewer line to clear blockage - overtime service

0.00

SERVICE **SERVICE** Tech **MIKE/PETE**
<none> Location

Qty used	Unit	Item	Description	Unit price	Ext price
2.00	EACH	AUGER LARGER SERVICE	Large Auger Service - OT	180.00	360.00
1.00	EACH	PRT	Pull & reset toilet	30.00	30.00
2,000.00	EACH	PUMPING	Pumping Service - OT	0.42	840.00
2,000.00	EACH	SEPTAGEFEE	Vermont Septage Fee	0.01	20.00

1000450 - 432006 FY19

JM

For your convenience, we accept Visa, MasterCard, and Discover.
Please call us to arrange payment by credit card.

Subtotal	1,250.00
Additional charges	0.00
Discount	
Sales tax	0.00
Payments received	0.00
Balance Due	**$1,250.00**

MS4 Annual Report Attachments – Misc

- Stream Flow Monitoring MOU
- Stream Flow Monitoring 2019 Invoice
- Phosphorus Control Plan Progress Memo from PCP Consultant

MEMORANDUM OF AGREEMENT BETWEEN THE VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND THE LISTED MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) COMMUNITIES

This Memorandum of Agreement sets forth the agreement between the parties, Vermont Department of Environmental Conservation (DEC) and the following Municipal Separate Storm Sewer System (MS4) Permittees: Burlington International Airport (BTV), City of Burlington (Burlington), Town of Colchester (Colchester), Village of Essex Junction (Essex Junction), Town of Essex (Essex), Town of Shelburne (Shelburne), City of South Burlington (South Burlington), City of Saint Albans (St. Albans City), Town of Saint Albans (St. Albans Town), University of Vermont (UVM), Vermont Agency of Transportation (VTrans), Town of Williston (Williston), and City of Winooski (Winooski) (collectively referred to as "the Parties"), for the purpose of participating in the Ecosystem Restoration and Water Quality Improvement Special Fund to perform the monitoring and other data collection required under the MS4 permitting program.

I. PROJECT PURPOSE:

The purpose of this Agreement, per Act 171 (H.650), Titled: Conservation and land development; stormwater; municipal separate storm sewer systems, is to aid participating MS4 Permittees in obtaining compliance with the flow monitoring requirements of their MS4 permits.

II. SCOPE OF WORK:

The parties agree to the following:

DEC will develop and manage a contract with a third party to carry out flow monitoring requirements as outlined in the existing MS4 permits. Upon signature of this Agreement, DEC will work with the undersigned MS4 Permittees and the contractor to ensure the flow monitoring requirements are met. As long as the MS4 Permittee contributes to the Water Quality Improvement Special Fund as outlined in Section V, they will be considered in compliance with the flow monitoring requirement of the MS4 permit. All management of the Contractor and non-compliance due to the Contractor will be the responsibility of DEC and will not result in any violations under the MS4 permit for any MS4 Permittee signed onto this MOU. DEC will provide the deliverables as outlined in section VIII.

The Parties will provide data on existing flow monitoring gauge sites, precipitation gauge sites, and other information considered to be necessary for the Contractor to complete the work. The Parties will provide funds, as agreed to in Section V, in order to initiate the flow monitoring. Failure to provide the funds as specified will be considered as non-compliance

with this Agreement and the Party will be responsible for maintaining compliance with the MS4 flow monitoring requirements through other means.

III. PROJECT BENEFITS

This project will help to assess the effectiveness of flow restoration plans for up to eleven stormwater impaired streams. Vermont's stormwater Total Maximum Daily Loads (TMDL) utilize flow targets to represent a range of stressors to water quality, from pollutant loads, land based and instream erosion, to increased flooding. Implementation of the flow restoration may take over fifteen years in some watersheds. Flow monitoring will be used by DEC and the Parties to ensure that the management practices implemented under the flow restoration plans are making progress towards the TMDL targets, and redirect efforts if needed.

IV. ENTITY ELIGIBILITY

The entities eligible to participate under the memorandum of understanding include any entity that is subject to the Vermont Municipal Separate Storm Sewer System (MS4) General Permit, signed on December 12, 2012. This includes the following MS4 Permittees: Burlington, Colchester, Essex, Essex Junction, Milton, Rutland Town, Rutland City, St. Albans City, St. Albans Town, Shelburne, South Burlington, Williston, Winooski, UVM, BTV, and VTrans.

V. FINANCIAL CONTRIBUTIONS

As developed by the eligible entities, all participating MS4 communities will divide the costs of the contracted work and pay DEC according to the table below.

		Costs by State Fiscal Years (July 1 – June 30)				
MS4 Permittee	**% of Total Cost**	**2017**	**2018**	**2019**	**2020**	**2021**
BTV	2.1%	$3,623	$2,805	$2,796	$2,087	$2,140
Burlington	7.4%	$12,782	$9,898	$9,866	$7,364	$7,549
Colchester	5.3%	$9,232	$7,149	$7,126	$5,319	$5,452
Essex Junction	6.1%	$10,625	$8,228	$8,201	$6,122	$6,275
Essex	6.0%	$10,473	$8,111	$8,084	$6,034	$6,185
Shelburne	7.0%	$12,185	$9,436	$9,405	$7,021	$7,196
South Burlington	17.4%	$30,170	$23,363	$23,287	$17,383	$17,818
St. Albans City	6.6%	$11,418	$8,842	$8,813	$6,579	$6,743
St. Albans Town	7.1%	$12,287	$9,515	$9,483	$7,079	$7,256
UVM	5.5%	$9,564	$7,407	$7,382	$5,510	$5,648
VTrans	16.6%	$28,794	$22,298	$22,225	$16,590	$17,005
Williston	6.2%	$10,668	$8,261	$8,234	$6,146	$6,300
Winooski	6.6%	$11,363	$8,799	$8,770	$6,547	$6,711

		Costs by State Fiscal Years (July 1 – June 30)				
MS4 Permittee	**% of Total Cost**	**2017**	**2018**	**2019**	**2020**	**2021**
Total	**100.0%**	**$173,184**	**$134,112**	**$133,672**	**$99,781**	**$102,278**

Each participating MS4 Permittee to this agreement is required to submit the payment listed above on or before May 1 each year in order to be considered in compliance with the terms of the agreement for that year. Payments shall be made directly to DEC. If payment is not received in time, monitoring services as provided by the Contractor to the State will be discontinued.

Actual costs are dependent on the finalization of the Contract with the selected Contractor. Fiscal year 2020 and 2021 are anticipated costs based on renewal of the Contract for monitoring services with the selected Contractor.

VI. PROJECT CONTACTS

Parties Contacts
See Attachment A

DEC Contact
David Pasco
Admin. and Innovation Division
802-490-6112
david.pasco@vermont.gov

VII. EFFECTIVE DATE; MODIFICATION

This Memorandum of Agreement shall be effective from the date of execution and shall terminate on June 30, 2021. This Memorandum of Agreement may be amended or modified at any time by mutual written agreement of all Parties.

This agreement will provide monitoring services for the participating MS4 Permittees from State Fiscal Year 2017 (July 1, 2016) through State Fiscal Year 2021 (June 30, 2021).

VIII. DELIVERABLES

Each of the Parties will provide the following deliverables to DEC:

1. Data on existing flow monitoring gauge sites, precipitation gauge sites, and other information considered to be necessary for the Contractor to complete the work, as requested.

2. Notification of any changes in the MS4 Communities' participation in this agreement as early as practicable.

3. Payment of funds as outlined in Section V.

DEC will provide the following deliverables to all participating entities:

1. A comprehensive report outlining Quality Assurance/Quality Control protocols, shall be submitted to all participating entities prior to the initiation of monitoring.

2. Mean daily discharge in cubic feet per second at each site for each day of the monitoring period calculated from measurements taken at five minute intervals.

3. A platform for continuous remote access to streamflow gaging station data (i.e., satellite, radio, or cellular telemetry) complete with real-time data loss notification systems.

4. Mean daily depth of precipitation in inches (to the nearest 0.01 inch) at each site for each day of the monitoring period, calculated from measurements taken at five minute intervals and form of precipitation identified (rain vs. snow).

5. An annual report on each impaired stream with the flow duration curve and calculated flow metrics, and a brief narrative describing the preceding field season, gage configuration, and how data was collected and compiled.

6. On an annual basis, compiled sub-daily data, with field notes available upon request.

WE, THE UNDERSIGNED PARTIES, AGREE TO BE BOUND BY THIS AGREEMENT.

STATE OF VERMONT

Dept of Environmental Conservation

By:

_____

Commissioner

Dept of Environmental Conservation

Date: _____

THE PARTICIPATING PARTIES:

TOWN OF COLCHESTER

By: Bryan K. Osborne

Title: Director of Public Works

Town of Colchester

Date: 3/21/16

STORMWATER Operating Fee INVOICE

VERMONT WATERSHED MANAGEMENT

Billing Date: April 16, 2019

Vermont Agency of Natural Resources
Department of Environmental Conservation
Watershed Management Division
1 National Life Drive
Main Building, Second Floor
Montpelier, VT 05620-3522

Payor:	Town of Colchester Bryan Osborne 781 Blakely Road Colchester VT 05446
Permit Number:	**7023-9014.A**
Permit Name:	MS4 Town of Colchester
Permit Expiration Date:	12/5/2017
Total Impervious:	1061.30
Impervious Designated to this Permittee:	1061.30

Transaction Type	Date	Amount
Operating Fee	11/25/2017	$10,613.00
MOU Fee	This fee is due prior to 5/1/2018	$7,149.00
Payment Received	5/25/2018	($10,613.00)
MOU Payment Received	5/25/2018	($7,149.00)
Payment Received	10/25/2018	($10,613.00)
MOU Payment Received	10/25/2018	($7,126.00)
Operating Fee	11/25/2018	$10,613.00
MOU Fee	This fee is due prior to 5/1/2019	$7,126.00
Operating Fee	11/25/2019	$10,613.00
MOU Fee	This fee is due prior to 5/1/2020	$5,319.00
	YOUR AMOUNT DUE:	**$15,932.00**

2104434 - 445001 Stormwater Permitting

Please Reference: Permit Number/Invoice: **7023-9014.A**

2104434 - 445000 Flow Monitoring

Your operating fee is due by: 11/25/2019 This bill is for future reference

FY20 KAA 7-26-19

The MOU (Memorandum of Understanding) fee is a division of costs between all MS4 communities for flow monitoring in stormwater impaired streams. You will be billed on an annual basis based on the fee structure specified in the MOU. Please refer to the Flow Monitoring MOU for further details.

The Stormwater Program has administratively continued the current Municipal Separate Storm Sewer System (MS4) General Permit which expired on December 6, 2017. Your authorization will remain in full force and effect until a replacement permit is issued. You will be notified when a new application is due. Please refer to the MS4 website at: http://dec.vermont.gov/watershed/stormwater/permit-information-applications-fees/ms4-permit for additional information.

Memorandum

To: Karen Adams
Department of Public Works
Town of Colchester

Date: December 10, 2019

Project #: 58131.00

From: Lori Kennedy
Peter Smiar

Re: Colchester Phosphorus Control Plan – Dec 2019 Status

Over the past year, VHB has been assisting Colchester with developing a Phosphorus Control Plan (PCP) to satisfy requirements of the MS4 Permit Part 8.2 and Lake Champlain Phosphorus TMDL. This memorandum documents the progress made to date, including base load and target calculations, permit clarifications, and evaluation of phosphorus (P) reduction opportunities.

Base Load and Target Calculations

Following guidance provided by Vermont Department of Environmental Conservation (DEC), VHB recalculated the phosphorus base load and target phosphorus load reduction. The original calculations provided by DEC, based on the draft MS4 Permit, had included all developed lands within Colchester town boundary and therefore did not match the final MS4 Permit conditions. VHB completed a GIS analysis to identify Town-owned developed lands (parcels and roadways) within Mallets Bay and Main Lake segments as of 2010, using DEC's developed lands layer and Colchester's parcel data, and calculated the baseload using loading rates by land cover as provided by DEC. The phosphorus reduction target, to be achieved by June 17, 2036, is based on the percent reduction targets by lake segment as defined in the TMDL.

Table 1 presents the phosphorus base load and target reduction. These calculations were last updated by VHB on June 12, 2019 and were sent (as spreadsheet, webmap, and GIS files) to DEC for review on July 3, 2019. The webmap link is: http://vhb.maps.arcgis.com/apps/webappviewer/index.html?id=935e726cdbab4266ae6efde31cdd35b7

Table 1. Phosphorus Baseload and Reduction Target for Town-Owned Developed Lands

Lake Segment	Base Load (kg/yr)	Future Growth Reduction Target	Existing Lands Reduction Target	Total Developed Lands Target Reduction	Future Growth Reduction Target (kg/yr)	Existing Development Reduction Target (kg/yr)	Total Reduction Target (kg/yr)
Malletts Bay	189.7	4.0%	16.5%	20.5%	7.5	31.3	38.9
Main Lake	159.9	4.1%	16.2%	20.2%	6.5	25.8	32.3
						Total	71.1

Memorandum

Permit Clarifications

Through emails and an in-person meeting with Colchester and VHB, DEC provided the following clarifications and guidance on permit requirements, procedures, and crediting.

Phosphorus Reduction Calculations for Structure Treatment Practices (STPs)

DEC originally instructed us to use the online STP calculator to quantify P reduction for individual STPs. On August 23, 2019, DEC sent a BMP tracking table spreadsheet, along with a methodology document, that can also be used for P reduction calculations.

Future Growth

The TMDL Appendix A describes DEC's estimates for future growth of impervious area and P loads over the next 20 years. DEC sent a spreadsheet with Colchester Future Growth Calcs on August 23, 2019 and provided the following explanation:

> *When the TMDL targets were based on the load of the entire town, rather than municipally owned and controlled areas, there had been some question whether changes to development regulations or zoning laws that would otherwise cause less impervious to be built than would otherwise have been might be creditable. It was left that that would be the responsibility of the MS4 to develop the methodology and undertake the analysis. The analysis should include tracking of how much new impervious is added.*

Colchester is working with UVM to update 2014 impervious data based on aerial imagery flown last year.

Edits/Adjustments to PCP

In an email on August 23, 2019, DEC explained that MS4s must resubmit their PCP for review and approval every permit term (5 years). The BMP tracking table, attached to that email, should be updated annually and submitted with the annual report, along with the municipal roads inventory. Some changes to the PCP may require formal amendment, such as a large shift in expected reduction between practice types (structural practice versus municipal road fixes). DEC will deal with those on a case by case basis.

STP Locations

DEC clarified that the Town can take credit for STPs located outside the MS4 boundary.

Construction Site Erosion and Sediment Control

DEC does not give P reduction credit for construction site erosion and sediment control, as those practices prevent short-term impacts rather than achieving long-term P load reduction.

Memorandum

Phosphorus Reduction Credit Opportunities

VHB and Colchester have explored a range of opportunities to receive P reduction credits for structural treatment practices (STPs). Table 2 and Table 3 summarize the crediting options for existing and future STPs, respectively.

Table 2. Phosphorus Reduction Crediting Options for Existing (pre-2020) STPs

Category	Applicability	Maintenance Requirement	Opportunities	Limitations	Decision
Subjurisdictional	New development on private property that: - was built after 2010 - creates between 0.5 and 0.99 acres of new impervious (therefore not covered by state operational permit) - is regulated under Colchester's stormwater ordinance (Chapter 18)	Per MS4 Permit: Town must establish a maintenance agreement with the property owner(s) to ensure long-term maintenance. Can be conditions in a local permit or part of a town-approved plan. Per Emily Schelley's email 8/23/19, "The DRB approval may be sufficient provided that the municipality is able to accurately report whether the site is being maintained. There should be some requirement for the site to report to the MS4 and/or an inspection program to verify the practices are present and well-functioning. The annual report will include an area in which the MS4 will need to report on maintenance. I am not sure how much follow up there typically is with Colchester's DRB's approvals, but generally I wouldn't consider the approval alone enough to ensure compliance long term. "	Karen provided stormwater management documents for 18 subjurisdictional projects, along with full documentation for Watkins project. VHB calculated P reduction for Watkins project. Submitted package to DEC for feedback on whether documentation would meet requirements.	1) Documentation for most projects is insufficient to calculate P reduction 2) Town does not require the property owner/HOA to verify that practices are present and well-functioning. It wouldn't be feasible to retroactively require these projects to submit inspection reports.	We will not pursue due to lack of enforceable maintenance agreements
Accepted Roads (co-permittee)	Newly accepted public roads and associated SW infrastructure built after 2010		Colchester has around 20 co-permittee permits and will be adding another 10 on which Colchester shares impervious.	Co-permittee agreement allocates maintenance responsibility by property ownership. Most STPs are located on private property and are therefore maintained by the private property owner/HOA. The Town does not have the resources to take on maintenance of those STPs.	
Town-owned STPs installed after 2010	Installed after July 1, 2010 on developed lands that are not subject to the state's operational stormwater permit (so, < 1 acre impervious)		No existing projects that we're aware of	The Town's only stormwater-related public construction activities since 2010 (other than newly accepted roads) would be culvert replacements projects or maintenance and small repair projects.	
Retrofits to existing (pre-2002) impervious cover	STPs installed after 2002 to treat impervious (to 2002 standards) that existed before 2002 and lacked stormwater controls. Eligible projects would have impervious area existing pre-2002 and retrofit post-2002 to bring up to current standards. Not applicable to new development. Applicable to municipal and private sub-jurisdictional.		No existing projects that we're aware of		

Memorandum

Table 3. Phosphorus Reduction Crediting Options for Future (2020 and beyond) STPs

Category	Applicability	Maintenance Requirement	Opportunities	Limitations
Subjurisdictional	New development on private property that: - is not covered by state operational permit (< 1 acre impervious before 2022, < 0.5 acre impervious after 2022) - is regulated under Colchester's stormwater ordinance (Chapter 18)	Per MS4 Permit: Town must establish a maintenance agreement with the property owner(s) to ensure long-term maintenance. Can be conditions in a local permit or part of a town-approved plan. Per Emily Schelley's email 8/23/19, "The DRB approval may be sufficient provided that the municipality is able to accurately report whether the site is being maintained. There should be some requirement for the site to report to the MS4 and/or an inspection program to verify the practices are present and well-functioning. The annual report will include an area in which the MS4 will need to report on maintenance. I am not sure how much follow up there typically is with Colchester's DRB's approvals, but generally I wouldn't consider the approval alone enough to ensure compliance long term. "	Town could: 1) Lower threshold to < 0.5 acre to continue to take credit after 2022 2) Add a requirement to Ch 18 for annual inspection/reporting and/or change the stormwater fee and credit structure to incentive annual reporting	1) Lowering the Ch 18 threshold to < 0.5 acre impervious would likely yield very little P reduction and wouldn't be worth Town's increased permitting efforts. 2) The stormwater utility has a flat fee for residential; only allows fee credits for commercial properties. Would require significant change to the fee/credit structure to incentive reporting
Flow Restoration Plan projects	Installed after July 1, 2010 on developed lands that are not subject to the state's operational stormwater permit and/or Retrofit of impervious cover existing pre-2002		The Town has developed comprehensive Flow Restoration Plans (FRP) for the impaired portions of the Sunderland and Morehouse Brook watersheds within the Town's boundaries. The Town has partnered with the Town and Village of Essex, the VT Agency of Transportation, and the University of Vermont for the Sunderland Brook Watershed, which is currently in compliance with all requirements. The Town has partnered with the City of Winooski for the Morehouse Brook Watershed for which stormwater BMPs will be constructed per the implementation schedule in the FRP.	1) All projects will be built in Winooski and are under Winooski control. Colchester and Winooski are discussing an inter-municipal agreement to allow Colchester to take credit for 10% of phosphorus reduction. TBD. 2) Projects are being designed to manage flow, not water quality. Likely P reduction will be low.
Mallets Bay Scoping Study projects	Retrofits to existing impervious cover or Subjurisdictional new/re-development		To be explored. Karen emailed info on Sept 27, 2019	
New Subdivision projects/Accepted Roads (subdivision co-permittee)			To be explored, some site may be 3 acre sites, see below	

Memorandum

Category	Applicability	Maintenance Requirement	Opportunities	Limitations
3- Acre Sites	Upgrades to STPs in accordance with Engineering Feasibility Analysis	Town would likely be taking over full operational and legal responsibility for any STPs	Town has provided preliminary list of 3 acre sites. Due to Towns co-permittee status, taking over system may be unavoidable, but incorporating into MS4 would provide flexibility with implementation	Potentially higher reduction target (35%). Reimbursement challenges
Retrofits to existing (pre-2002) impervious cover	Town-owned STPs installed after 2002 to treat impervious (to 2002 standards) that existed before 2002 and lacked stormwater controls		To be explored	
Retrofits to existing STPs that have limited P reduction (e.g. detention basins)			To be explored. The idea would be to convert the STP to an infiltration basin, bioretention, gravel wetland, etc. (depending on site conditions) to achieve phosphorus reduction	

Permit Incorporation Form

MS4 Incorporation Form for State Issued Stormwater Permits

Please complete this form for each previously issued state stormwater permit that the MS4 plans to incorporate into the MS4 authorization. The stormwater management practices associated with the permit(s) listed below shall be listed in the MS4's Stormwater Management Program (SWMP) under Minimum Control Measure 5, Post-Construction Management.

Stormwater System Name	SW Permit No.	Current Permit Status	Stormwater Treatment Practice(s) (ie, Pond, Basin, Swale)	Upgraded or altered from previously issued permit (if so, include the final plan with the SWMP)	Current Compliance Status ("Compliant with previously issued permit" or detail the plan for compliance)	Legal Responsibility Secured
Wells Meadow	6585-INDS.R	Active	Stormwater runoff from public roadway, driveways, and sidewalk treated via roadside grass channels, and infiltration via drywells	No	compliant with previously issued permit	Yes

Colchester SWMP

Stormwater Management Program

The following represents the Town of Colchester's Stormwater Management Program, (SWMP) as required by the State of Vermont, Agency of Natural Resources, Department of Environmental Conservation, National Pollutant Discharge Elimination System, (NPDES), General Permit 3-9014 (2018) for Stormwater discharges from Small Municipal Separate Storm Sewer Systems. The SWMP contains measurable goals for the development and implementation of the six minimum measures described in Subparts IV.F and G of the permit, and additional measures necessary to protect water quality described in Part IV of the permit. unless otherwise noted, Colchester's Public Works Department is responsible for implementing this Stormwater Management Plan including the implementation of included Best Management Practices (BMPs).

WATER QUALITY BASED REQUIREMENTS

Pursuant to Clean Water Act 402(p)(3)(B)(iii), the permit includes provisions which require the permittee to reduce the discharge of pollutants to the maximum extent practicable, protect water quality, and to satisfy the Clean Water Act.

REQUIREMENTS TO MEET WATER QUALITY STANDARDS

Discharges shall not cause or contribute to an exceedance of applicable water quality standards for the receiving water. Applicable water quality standards are the Vermont Water Quality Standards that are in place upon the effective date of the permit.

Except for discharges addressed by part IV.C.1 of the permit, if at any time the Town becomes aware that a discharge causes or contributes to an exceedance of applicable water quality standards, the Town shall within 60 days of becoming aware of the situation eliminate the conditions causing or contributing to the exceedance of water quality standards. If elimination within 60 days is infeasible the Town shall document in its SWMP measures and anticipated timeframes to eliminate the conditions causing or contributing to the exceedance. Within 30 days of eliminating the condition, the Town shall document the measures used to correct the condition in the SWMP. The Town shall include in its annual report a description of any such discharges identified during the reporting period; a description of measures taken to eliminate conditions during the reporting period or the basis of a finding that elimination is infeasible; and a timeframe for completion of all steps necessary to eliminate such discharges. The Town shall comply with any additional requirements or schedules established by the Secretary,

including any requirements to submit additional information concerning the potential cause of the exceedance.

DISCHARGES TO IMPAIRED WATERS

The Vermont Agency of Natural Resources has identified both the Morehouse and Sunderland Watersheds as being impaired by stormwater. The Town of Colchester intends to achieve compliance through the implementation of the Stormwater Management Plan, (SWMP) contained on the following pages, to include specific actions outlined within the six minimum control measures.

The Vermont Agency of Natural Resources considers several of the unnamed tributaries into Malletts Bay, as well as Smith Hollow Brook and Crooked Creek to be impaired by e-coli. To minimize this pollutant, the Town's SWMP contains several strategies aimed at controlling e-coli contamination. These strategies include controlling sediment through the implementation of Construction Site Stormwater Runoff Controls, and Post-Construction Stormwater Management in New Development and Redevelopment. The plan also works toward the control of illicit discharges through the implementation of the Town's Illicit Discharge Detection and Elimination Program. The Town also intends to continue existing programs associated with animal control to facilitate the removal of dead animals from the roadway system, and programs to minimize dog waste in Town parks and along multi-use paths. The Town will also continue its Water Quality Monitoring Program which has been in existence now for almost two decades, to continue improving the Town's understanding of e-coli contamination in Malletts Bay. These efforts have been supplemented by a Microbial Source Tracking Program completed as part of the Town's Integrated Water Resources Management Plan.

DISCHARGES TO IMPAIRED WATERS WITH AN APPROVED TMDL

Flow Restoration Plans - The Town has developed comprehensive Flow Restoration Plans (FRP) for the impaired portions of the Sunderland and Morehouse Brook watersheds within the Town's boundaries. The Town has partnered with the Town and Village of Essex, the VT Agency of Transportation, and the University of Vermont for the Sunderland Brook Watershed, which is currently in compliance with all requirements. The Town has partnered with the City of Winooski for the Morehouse Brook Watershed for which stormwater BMPs will be constructed per the implementation schedule in the FRP. The approved FRPs contain the following;

- An identification of the suite of necessary stormwater BMP's that will be used to achieve the flow restoration targets.
- A design and construction schedule for the stormwater BMP's that has been identified as necessary to achieve the flow restoration targets.

- A financing plan that estimates the cost of implementing the FRP.
- A regulatory analysis that identifies and describes what, if any, additional regulatory authorities will be needed to implement the FRP.
- An identification of regulatory assistance that will be needed to implement the FRP.
- An identification of any third party that is responsible for implementation of the FRP.

Phosphorus Control Plan: The Town is in the process of developing a Phosphorus Control Plan in accordance with permit requirements outlined in Section 8.2 of the MS4 Permit. The Town is prepared to follow the prescribed timeline for PCP implementation also outlined in the permit, including the first annual PCP report due on April 1, 2019. A brief description of the work to be completed is below:

- Review of PCP requirements and phosphorus reduction targets for Colchester,
- Classification of the sources of phosphorus loading in our community using TMDL guidance,
- Identification of projects that have the potential to result in reductions in phosphorus loading,
- Evaluation of which projects will result in significant reductions in phosphorus loading,
- Consideration of improvements that strike the appropriate balance between cost and efficiency,
- Selection of projects most suited to Colchester,
- Estimation of the cost of full compliance with permit requirements based on selected projects,
- Development of an implementation plan in accordance with permit requirements,
- Preparation of a Road Stormwater Implementation Table in accordance with MRGP requirements,
- Preparation of the final report and executive summary for public consumption.

Landowner Technical Assistance –The Town's Planning and Zoning Office offers opportunities for property owners to come and ask questions about site development through Technical Review Committee Meetings. These are free for property owners and technical staff from both the Planning and Zoning Department and the Public Works Department provide advice and guidance for how to develop the property in ways that protect natural resources, conform to Town zoning regulations, and best achieve the landowner's development goals.

Protection and Regulation of Development in Stream Corridors – The Town has previously developed and submitted a plan to the VANR outlining options for enhanced protection of stream corridors of stormwater impaired waters. The plan includes a map of stream corridors depicting areas that have been converted to impervious surface and areas that are undeveloped or have not been converted to impervious surface, (updated for this application), a Stream Corridor Buffer Ordinance and other applicable Zoning Regulations, and the development and

adoption of Stormwater Control Ordinances. The preparation of the plan was developed after review of the riparian buffer and stream fluvial geomorphological information provided by the VANR as a result of the Agency's preparation of TMDL's as set forth in 10 V.S.A § 1264 (f)(3).

Flow and Precipitation Monitoring Program – The Town will continue to jointly implement or otherwise fund a flow and precipitation monitoring program, subject to approval by the Secretary, within its watersheds impaired by stormwater in collaboration with other MS4 communities.

Six Minimum Control Measures – The Town has developed a SWMP which contains the required Six Minimum Control Measures to reduce pollutants to the Maximum Extent Practical.

Impervious Surface Minimization – In 2016, the Town revised zoning regulations along West Lakeshore Drive, which has a number of permitted direct discharges to Lake Champlain, in regards to impervious surfaces and stormwater runoff mitigation. There were two new zoning districts that were created (Lakeshore 1 and Lakeshore 2), replacing the underlying zoning districts previously in the area. Lakeshore 1 includes all properties on the "Lake side" of West Lakeshore Drive, and Lakeshore 2 includes properties with frontage on the "Non-Lake side" of West Lakeshore Drive. The allowable lot coverages for LS1 and LS2 were reduced over the previous district requirements; to increase lot coverage beyond the new limit a property owner must utilize green infrastructure techniques to mitigate runoff from the additional impervious surfaces. Most of the lots in these two districts exceed the new allowable lot coverage limits, so it is likely that any substantial development occurring in these areas will be offset by GSI installations. The permitted and conditional land uses in LS1 were drastically limited in terms of intensity, when coupled with the instability of the steep slopes and small lot sizes, will protect further degradation of these sensitive environmental areas along Lake Champlain.

DISCHARGES TO IMPAIRED WATERS WITHOUT AN APPROVED TMDL

Erosion Controls - Within the Town's SWMP, erosion controls have been adopted. Past efforts have included the design and construction of a stormwater outfall treatment structure which collects sediment before stormwater is discharged to Malletts Bay, two large river bank stabilization projects on the lower Winooski River located at the Heineberg Access off Heineberg Drive, and along River Road in Colchester, and eight stormwater outfall upgrade projects located in the Indian Brook, Colchester Pond Brook, Winooski River, Inner Malletts Bay and Sunderland Watersheds. In 2009, a large stormwater outfall project was constructed in Fort Ethan Allen within the Sunderland Watershed. A number of culvert upsizing and stabilization projects have been completed or are currently in the design phase, including the upsizing of a culvert on East Road in 2018 and the planned upsizing of an existing pair of undersized culverts serving Hercules Drive.

Gravel Road Maintenance - Although Colchester's limited gravel road system represents only about 25% of the state average, the Town has taken several steps to minimize the runoff from this portion of the transportation system. The Town has developed an alternative methodology to perform Traffic and Engineering studies on gravel roads for the establishment of speed limits. This allows the Town to post speed limits that do not exceed 35 mph along gravel roads, which in turn, significantly reduces the degradation of the gravel surface. Our equipment operators continue to receive regular training on the proper grading of gravel roads which allows less gravel to be applied to the roadways, and minimizes the amount of gravel that enters roadside ditches. The technical specifications of the Town's equipment have been revised to facilitate these proper grading procedures. The Town has also completed several erosion control projects along gravel roads to reinforce roadside ditches to minimize erosion of the ditch lines and the edge of the roadways during periods of high runoff. As a part of new development, the Town's design review process includes assessing the adequacy of stormwater culverts, both public and private to avoid flood damage due to high runoff. The Town also cleans roadside ditches of debris and buildup on an as needed basis to ensure that blockages do not result in washouts within the drainage system. Finally, the Town's gravel road system serves primarily agricultural areas, where the Town has taken deliberate steps to preserve this land use, which generally prevents high density development within these areas.

Riparian Buffers - Several years ago, the Town of Colchester developed and adopted a stream bank protection ordinance. Generally, the ordinance does not allow development within 85 feet of major streams and tributaries throughout the community. Supplemental information for this ordinance has been developed and submitted to the ANR. The Town has also developed a Street Tree Master Plan which is aimed at re-establishing the community's urban forest. All new development in Colchester is required to submit for review and approval, a vegetation and landscape plan. In areas adjacent to water bodies, such as project sites located within the

Shoreland Overlay District, no more than 25% of existing trees on a project site can be removed.

Impervious Surface Minimization - The Town has adopted revisions to its Technical Roadway Standards. The revised standards allow for most roadways to be constructed at a narrower width, and as well, allow increased options for open drainage systems to promote pre-treatment of stormwater runoff. New standards have been developed to support High Density Mixed-Use Development, which requires that pedestrian areas contain a minimum of 25% green space. The Town has also revised its Zoning Regulations reducing the allowable impervious surfaces in front yards from 50% to 30%.

Chloride Response Plan – With a 1.2 mile section of Sunnyside Brook listed on the State's 303(d) List, Part A for chloride impairment, the Town is required to develop a Chloride Response Plan. This Plan will include specific actions that are designed to achieve salt reduction on municipal roads and facilities within the impaired stream's watershed. Staff will review and document existing snow and ice removal policies, purchasing procedures, and staff training activities on the topic to identify opportunities for salt reduction. The Town will investigate whether ordinances regulating storage or application of salt within properties discharging to the MS4 are appropriate and necessary. The Town would look to state-established guidance on application rates if an informational brochure to property owners is called for within the Plan. The Salt Reduction Plan will be developed by Town Staff and adopted during this permit cycle (prior to February 2024).

Six Minimum Control Measures – The Town has developed a SWMP which contains the required Six Minimum Control Measures to reduce pollutants to the Maximum Extent Practical.

MINIMUM CONTROL MEASURES

Minimum Control Measure #1: Public Education and Outreach on Stormwater Impacts

BMP 1-1 *Maintain Stormwater Web Site* - The Town of Colchester has developed a stormwater website which contains local stormwater information. The Department's site will be updated as needed to include general, as well as locally relevant information relating to stormwater and water quality. The Town's web site is located at www.colchestervt.gov. The Town also maintains a stormwater utility website that describes utility projects, funding, and goals. The utility website is located at www.colchestervt.gov/1837/stormwater-utility.

Measureable Goal: Permittee will keep annual budget information current on the webpage and promote website's existence and use in stormwater utility newsletters (See BMP 1-4). **Rationale**: Permittee websites are often the place where residents first go to obtain information on stormwater issues. Provision of basic information on such websites will help form a strong initial form of engagement to site visitors.

BMP 1-2,3 *Landowner Technical Assistance –* The Town's Planning and Zoning Office offers opportunities for property owners to come and ask questions about site development through Technical Review Committee (TRC) Meetings. These are free for property owners and technical staff from both the Planning and zoning Department and the Public Works department provide advice and guidance for how to develop the property in ways that protect natural resources, conform to Town zoning regulations, and best achieve the landowner's development goals. The Town's website also provides information regarding the several agencies and organizations in Chittenden County performing these services.

Measureable Goal: Continue to provide TRC reviews for land owners on an as-requested basis and ensure any web links provided are accurate annually. **Rationale**: TRC Meetings assist property owners in considering development on their site, allows staff to offer design guidance and water quality recommendations, and avoids a lengthy DRB process for applicants. There are several organizations and agencies operating in the Chittenden County MS4 region that provide a range of technical assistance options for interested parties. By providing such links, the visitor can figure out which entity is best suited to provide technical assistance.

BMP 1-3 *Participation in RSEP -* The Town of Colchester will continue to participate in the regional stormwater education and outreach strategy described in the 2018 Memorandum of Understanding between designated MS4's, and the Chittenden County Regional Planning Commission. A copy of this MOU associated with this regional initiative is contained within the appendix of this application and is effective until June 30, 2022.

Measurable Goal: Participation in and financial support for the operation of the Rethink Runoff program. **Rationale**: A regional approach to stormwater education allows for a wider "reach" of promotional materials and a larger funding pool to support those efforts.

Additional BMPs adopted for Minimum Measure 1

Below is the only additional BMP considered or selected for compliance with MM-1.

BMP 1-4 *Newsletters* – The stormwater utility is committed to funding the design and mailing costs associated with an annual newsletter discussing stormwater projects, issues, concerns, and updates. These hard-copy newsletters are mailed to each postal customer in the community. Color versions are shared on the Town's website and social media platforms after mailing.

Measureable Goal: Send one community newsletter to the public annually. **Rationale**: Utility newsletters are an opportunity to communicate directly with our residents about locally relevant water quality issues and augment the outreach performed by ReThink Runoff.

Minimum Control Measure #2: Public Involvement and Participation

BMP 2-1,2,3 *Participate in RSEP* - The Town of Colchester will continue to participate in the regional stormwater education and outreach strategy described in the 2018 Memorandum of Understanding between designated MS4's, and the Chittenden County Regional Planning Commission. A copy of this MOU associated with this regional initiative is contained within the appendix of this application and is effective until June 30, 2022.

Measurable Goal: The permittee will participate in and provide financial support for operation of the Rethink Runoff Stream Team. Via an annual report provided by the Chittenden County RPC's subcontractor, the permittee will document on an annual basis the number of participants and/or persons contacted by outreach events and hands-on activities through the Rethink Runoff Stream Team. **Rationale:** Through support of the Stream Team, the Town will support the engagement of local residents in the MS4 area via outreach events and via hands-on participation events.

Additional BMPs adopted for Minimum Measure 2

Below are the only additional BMPs considered or selected for compliance with MM-2.

BMP 2-4 *Catch Basin Stenciling* - The Town is committed to organizing and overseeing a catch basin stenciling project at least once a permit cycle. In prior years partners have ranged from the Colchester Boy Scouts, Cub Scouts, community volunteers, and Colchester High School students. In the fall of 2018, with Colchester High School as a project partner, junior and senior environmental science students stenciled catch basins in the Julie Drive, Jason Drive, and Fox Run areas using stencils owned by RSEP. Where possible, the stenciling is scheduled as part of a lecture or other educational event focusing on water quality. Events similar to the fall 2018 stenciling event will be organized by Town staff, with support by the Conservation Commission as needed.

Measurable Goal: Complete one stenciling event during length of permit cycle. **Rationale**: These projects seek to educate students and residents about the importance of understanding how storm drains work and as a result assist in keeping our waterways clean of trash and debris.

BMP 2-5 *Community Stream Corridor Cleanup* – As a part of the Town's Green Up Day activities, the Town works with its Conservation Commission to specifically target its cleanup efforts toward high priority areas. These high priority areas include a total of 25 significant stream crossings of the Town's transportation system. The Town intends to continue supporting and coordinating these significant public involvement initiatives.

Minimum Measure #3: Illicit Discharge Detection and Elimination

BMP 3-a *Develop and enforce a program to detect and eliminate illicit discharges* – The Town has previously developed a program to detect and eliminate illicit discharges. The program elements include the development and maintenance of a GIS map of the storm sewer system, the development of an illicit discharge ordinance, an illicit discharge detection plan, a public informational component, a mechanism to address specific categories of illicit discharges if necessary, and an annual reporting process.

BMP 3-1 *Develop and maintain a storm sewer GIS map* – The Town currently maintains a storm sewer GIS data layer for the entire community that indicates the location of all Town-owned stormwater lines and outfalls and labels the waters of the state that receive discharges from those outfalls. The Town has recently embarked on a Town-wide Stormwater Condition Assessment project, where one of the data tasks is associated with confirming the accuracy of this existing dataset. While the focus of the project is not our GIS layer, a secondary result of the project's completion will be a totally up to date GIS layer for Town infrastructure. To maintain this database, a three tiered approach has been developed to document 1) existing stormwater infrastructure, 2) additional stormwater infrastructure added through the Town's maintenance efforts and/or capital improvement projects, and 3) additional stormwater infrastructure associated with new development and plan for their digitization within the GIS database maintained by the Town.

Existing Stormwater Infrastructure – The existing GIS data layer is currently under review for accuracy and will be up-to-date by the end of that project, expected in late 2019.

Future Town Installed Stormwater Infrastructure – As a part of any future project completed by the Town, an as-built drawing in digital form will be required in order to document additions or changes to the system.

Future Developer Installed Stormwater Infrastructure - The Town has approved amendments to its sub-division regulations to require that developers provide the Town with as-built information associated with new development, in digital form.

BMP 3-2 *Develop and implement an Illicit Discharge Ordinance* – The Town has developed and implemented an Illicit Discharge Ordinance. The ordinance regulates the contribution of pollutants to the MS4 from stormwater discharges by any user, prohibits illicit connections and discharges to the MS4, and establishes legal authority to carry out the IDDE Plan, including conducting inspections, monitoring, and enforcement procedures to ensure compliance with the ordinance. The ordinance was adopted by the Colchester Select Board on July 26, 2005.

BMP 3-3 *Develop and implement an illicit discharge detection plan, focus on impaired waters and random dumping* – The Town developed a IDDE Plan in 2008 containing the following sections;

Sec. 1.0 Introduction
Sec. 2.0 Illicit Discharges Defined
Sec. 3.0 Additional Exemptions
Sec. 4.0 Illicit Discharge Ordinance
Sec. 5.0 Development of Storm Sewer Map
Sec. 6.0 Locating Priority Areas
Sec. 7.0 Tracing the Source of an Illicit Discharge
Sec. 8.0 Removing the source of an Illicit Discharge
Sec. 9.0 Evaluation of the IDDE Program
Sec. 10.0 Outreach to Employees, Businesses, and the General Public
Sec. 11.0 BMP's and Measurable Goals

BMP 3-4 *Inform public of illicit discharge and disposal hazards* – Section 10.0 of the Town's IDDE plan outlines the Town's efforts to address this requirement. On an annual basis, the Town's maintenance employees receive training relating to Pollution Prevention/Good Housekeeping for Municipal Operations as part of the Town's Phase II plan. The Department of Public Works has developed an informational brochure designed for local businesses to improve their understanding of illicit discharges. The Public Works Department implements a stormwater stenciling program with a goal of raising awareness that storm drains are not for dumping. The Town is a member of RSEP, which provides

informational campaigns targeted at the general public covering a wide variety of stormwater issues. The Town maintains its own stormwater and stormwater utility web sites providing additional stormwater education materials to the community. The Town has also implemented a Water Quality Hotline where community members can report any activities, express concerns, or generally inquire about the Town's illicit discharge program.

BMP 3-5 *Address specific categories of Illicit Discharges, if necessary* – The Town has not found the list of non-stormwater discharges contained in the permit to be a significant contributor of pollutants to the MS4, and therefore have not addressed these categories within the IDDE plan.

BMP 3-6 *Prepare annual report of monitoring and corrective actions taken* - The Town has established files to maintain all documents relating to the management of illicit discharges. A complaint system has also been established to receive citizen complaints through a stormwater hotline. The hotline is posted on the Town's web site. Annual monitoring of pre-selected outfalls as outlined in the Town's IDDE plan are performed and reported in the Town's annual report to the DEC. When illicit discharges are detected through this program, or come to be known by the Town through other means, the Town takes the appropriate steps to address them under the authority of local ordinances.

Measurable Goals & Rationale for Minimum Measure #3

The BMP's identified under this minimum control measure are aimed primarily at improving total species numbers and species density in receiving waters through the reduction of toxins in stormwater runoff.

There were no major alternative BMP's examined under this minimum control measure.

The implementation of this measure will require the continued support of both the community and its legislative body to support the enforcement of a local ordinance to regulate and prohibit illicit discharges.

The expected water quality outcomes under this minimum control measure are improvements in total species numbers and species density within receiving waters through the reduction of toxins in stormwater runoff.

Minimum Measure #4: Construction Site Stormwater Runoff Control

BMP 4-1 *Develop and implement procedures to ensure MS4 construction activities are properly permitted.* - The Town will continue to perform plan review of all projects involving land disturbance as a part of the site plan review process and the issuance of building permits. All activities involving land disturbances will continue to require a permit from the Town. All permits issued from the Planning and Zoning Office are evaluated by staff, either as an Administrative Review, or through the Town's Development Review Process. Through the permit application process, a determination will be made by the Planning and Zoning Office regarding the total area of land disturbance. This Office will determine whether the one-acre and five-acre state regulatory thresholds are met, and report such activities to the Secretary of the Agency of Natural Resources to assure all such projects are properly permitted.

BMP 4-2 *Review existing MS4 regulations for effectiveness in managing construction related E & S and consistency with state construction permits* - The Town relies upon the technical specifications within the Public Works Ordinance and the Town's Stormwater Ordinance as the mechanism to require erosion and sediment controls at construction sites. The language within these documents works to ensure effectiveness in managing construction related erosion and sediment and other wastes generated from construction activities that may cause adverse impacts to water quality. These documents also ensure consistency with the requirements of the Secretary's general permits for stormwater runoff from large and small construction sites. The erosion control requirements within these documents apply to all land disturbances requiring a permit as required in the Town's Zoning Regulations. Currently, all land disturbances require a permit. Inspection responsibilities for all such permits issued are assigned to the Town's inspectors. Any local violations would be noticed by the inspectors, with enforcement action, if necessary, taken by the Town of Colchester based upon the construction site erosion control requirements within the Town's Public Works and Stormwater Ordinances. The Town will endeavor to inspect all construction sites as often as possible, with emphasis on larger projects, and those projects that are located in areas where run off to receiving waters is more likely. Inspections will also be targeted at phases of the construction that may be more susceptible to problems relating to construction site run off. During regular inspections, Town inspectors will inspect for obvious signs of non-compliance such as eroding soils and turbid waters on state permitted projects. Town inspectors will report any suspected violations on these projects to the Vermont Agency of Natural Resources.

BMP 4-3 *Develop and implement an erosion control ordinance that regulates development not subject to state permitting* – The Town has developed a

stormwater ordinance which contains a section on construction erosion control requirements that effectively regulates development activities that are not subject to state or federal erosion control requirements.

Measurable Goals & Rationale for Minimum Measure #4

The BMP's identified under this minimum control measure are aimed primarily at improving the nutrient index within receiving waters by reducing the discharge of phosphorous and nitrogen, improving clean water species counts by reducing stormwater runoff volume during construction before stormwater controls are completed, and improving total number of species and species density by reducing the discharge of sediment and toxins that are generated by construction activities.

There were no major alternative BMP's under this minimum control measure.

The implementation of this measure will require the support of both the community and its legislative body to support the enforcement of local ordinances to regulate run off from construction sites.

The expected water quality outcomes under this minimum control measure are improvements in the nutrient index, clean water species, total species numbers, and species density within receiving waters through the reduction of phosphorus, nitrogen, sediment and toxins in stormwater runoff.

Minimum Measure #5: Post-Construction Stormwater Management in New Development and Redevelopment

BMP 5-1 *Review existing MS4 regulations for effectiveness in managing stormwater runoff from new development and redevelopment projects* - The Town performs plan review of all projects involving land disturbance as a part of the site plan review process and the issuance of building permits. All permit conditions associated with projects involving land disturbance are included in the approved Findings of Fact and Order approved by the Development Review Board. This document becomes the instrument for enforcing the Board's approval. Town Staff feels the current regulations are effective in preventing adverse impacts to water quality as a result of new or redevelopment.

BMP 5-2 *Review existing MS4 regulations for consistency with State rules and permits* – The Town relies upon the technical specifications within the Public Works Ordinances and the Town's Stormwater Ordinances as the mechanism to address post-construction runoff from new development and redevelopment that result in a land disturbance of greater than one acre and that have less than one

acre of impervious surface. The Ordinances contain a combination of structural and non-structural BMP's which are appropriate for the community and consistent with the Agency's 2017 Vermont State Stormwater Management Manual (and any amendments thereto). Additionally, the Ordinances ensure consistency with the requirements of the Secretary's general permits regulating stormwater runoff from new development and redevelopment projects that have one or more acres of impervious surface. These post-construction stormwater controls and requirements apply to all land disturbances requiring a permit as required in the Town's Zoning Regulations. Through the Town's Public Infrastructure Ordinances, Stormwater Ordinances, Sub-division Regulations and Zoning Ordinances, the Town's requirements related to Post Construction Runoff Control are consistent with and as stringent as state requirements.

BMP 5-3 *Assess whether changes can be made to MS4 regulations to support low impact design options*- The Town has taken several steps in support of Low Impact Development. These include the design of parking lots, roadways, the development of stream bank buffer ordinances, homeowner educational efforts through RSEP, as well as offering and/or coordinating public workshops associated with the use and construction of rain barrels, rain gardens and other LID strategies. The Town has also adopted Lakeshore 1 and Lakeshore 2 Zoning Districts that require the use of green stormwater infrastructure to increase lot coverage. The Town is continuing to explore grant opportunities to fund residential education programs related to minimizing impervious surfaces and mitigating residential stormwater runoff.

BMP 5-4 *Assess changes to regulations to minimize impervious surfaces through street & parking design* – The Town has made significant revisions to its technical specifications for public infrastructure allowing significantly reduced roadway widths for smaller scale development, as well as allowing the option of open drainage plans to promote improved treatment of stormwater runoff. Within the Town's Zoning Regulations, the Town requires the design and construction of parking areas to promote stormwater management through the use of trees, vegetation and stormwater filtration areas all intended to reduce the amount of impervious services and improve overall stormwater treatment. The Town will continue to assess other improvements to these and other regulations to determine whether additional improvements can be made.

BMP 5-F1,2,3 *Stormwater Management for sites not subject to regulation under the Agency's permitting programs* – The Town has developed a stormwater ordinance that regulates post construction runoff controls for new development or redevelopment projects that disturb greater than or equal to one acre that are

part of a larger common plan of development or sale and may not be subject to regulation under the Agency's post-construction stormwater management permit program. Projects that intend to create more than half an acre of impervious surface must provide a Stormwater Management Plan with their development application. Such a Stormwater Management Plan must be prepared by a licensed engineer and demonstrate conformance to applicable water quality standards. This includes sufficient engineering analysis to show that the proposed stormwater treatment practices are capable of controlling runoff from the site, hydrologic and hydraulic design calculations demonstrating that post-development stormwater runoff flows shall be limited to equal or less than pre-development stormwater runoff flows for a twenty-five year, twenty-four hour storm event, and indicate areas where maintenance easements will be needed. The applicant must execute a maintenance agreement and any associated easements binding on all subsequent owners of land served by any on-site stormwater measures, record those documents in the land records prior to issuance of a building permit, and specify any and all required maintenance for practices along with a maintenance schedule specifying when and how often maintenance is performed. The applicant is required to maintain records that verify maintenance was performed for at least three years.

BMP 5-G1 *Develop and implement procedures for inspecting development for compliance*– The Town's Zoning Regulations require all ground disturbing activities to obtain a permit, and all permits require inspections by the Town's Building Inspector for compliance with conditions of approval before the project receives a Certificate of Occupancy. Through the review of permit applications, the Planning and Zoning Office identifies which regulations are applicable and condition each approval based on conformance with any applicable regulations.

BMP 5-G2 *Develop and implement procedures to assure that development and redevelopment activities undertaken by the permittee are properly permitted and maintained.* – The Town has adopted Construction Standards Applicable to Land Development, also known as Chapter 14 of the Colchester Code of Ordinances. Chapter 14 specifies that: *"The requirements, specifications and standards contained in this Chapter are applicable only to public improvements associated with new development, or, the expansion or extension of existing public improvements. No public improvements, except municipal maintenance, shall occur or be constructed or altered, except in conformance with the requirements set forth and incorporated herein. The Colchester standards contained in this Chapter are considered the minimum acceptable standard specifications for the Town of Colchester."* Additionally, The Town's Zoning Regulations require all ground disturbing activities to obtain a permit, and all

permits require inspections by the Town's Building Inspector for compliance with conditions of approval before the project receives a Certificate of Occupancy. Through the review of permit applications, the Planning and Zoning Office identifies which regulations are applicable and condition each approval based on conformance with any applicable regulations.

Measureable Goals & Rationale for Minimum Measure #5

The BMP's identified under this minimum control measure are aimed primarily at improving clean water species counts by reducing or attenuating stormwater runoff volume and by reducing the effects of stormwater scouring and flooding.

There were no major alternative BMP's under this minimum control measure.

The implementation of this measure will require the support of both the community and its legislative body to support the enforcement of local ordinances to regulate post-construction stormwater runoff.

The expected water quality outcomes under this minimum control measure are improvements to the clean water species by reducing or attenuating stormwater runoff volume and by reducing the effects of stormwater scouring and flooding.

The regulatory mechanisms used by the Town to address post-construction runoff from new development and re-development include the Public Works Specification and Standards, the Colchester Stormwater Ordinance, the Town's Sub-Division Regulations and the Town's Zoning Regulations. These mechanisms were selected as the most effective approach to managing post construction runoff.

All land disturbances require a permit from the Town. Through the issuance of a permit, the appropriate conditions are attached to the permit, that require the post-development landowner to perform the proper long-term operation and maintenance of the BMP's required through the review and approval process that are not taken under public ownership.

The Town has developed and will continue to use local Zoning Regulations to provide the legal authorities and strategies to protect and regulate development in the stream corridors of stormwater impaired waters as defined by 10 V.S.A § 1264 (a)(13).

The Town has developed and submitted a plan to the VANR outlining options for enhanced protection of stream corridors of stormwater impaired waters. The plan includes a map of stream corridors depicting areas that have been converted to impervious surface and areas that are undeveloped or have not been converted to impervious surface. The preparation of the plan was developing after review of riparian buffer and stream fluvial geomorphological

information provided by the VANR as a result of the Agency's preparation of TMDL's as set forth in 10V.S.A § 1264 (f)(3).

For those areas of stream corridors that have been developed or otherwise converted to impervious surfaces, the plan for enhanced protection of stream corridors of stormwater impaired waters identifies options for stream corridor restoration as outlined.

The Town of Colchester, through both its Public Works Department and Planning and Zoning Department are responsible for the overall management and implementation of the post-construction stormwater management program. The Directors from these departments have the primary responsibilities, with specific tasks delegated to the Public Works Operations Manager, Town Engineer, and Town's inspectors.

The success of this minimum measure will be evaluated through developing and achieving measurable goals. The selection of measurable goals has been completed in a manner that allows the Town to gauge program effectiveness. Additionally, the measurable goals have been based upon the needs and characteristics of the Town and the area served. Finally, they have been selected to ensure an integrated approach that fully addresses the requirements and intent of this minimum control measure.

Pollution Prevention/ Good Housekeeping for Municipal Operations

BMP 6-1 - 4 *Implement an operation and maintenance program that includes a training component and has ultimate goal of reducing pollutant runoff*– Town maintenance crews shall receive annual training associated with the correct procedures to minimize the discharge of sediments, toxins, phosphorus, nutrients and other harmful contaminates, that may be caused through the Town's municipal operations. Training exercises shall contain at a minimum, an understanding of the location and characteristics of the natural resources that may be vulnerable to municipal operations, sources of contamination that may be generated from the municipal operations, and how they may impact natural resources, procedures to minimize the potential effects of municipal operations on natural resources, the specific requirements and conditions of the Town's Phase II permit, and procedures for complying with any applicable state and federal laws for proper disposal of wastes.

The Town of Colchester has four municipal functions that are impacted by our operation and maintenance program. These include the following:

Highway Maintenance:

Snow Removal Activities: - The Town's snow and ice removal procedures are designed to minimize the use of de-icers and abrasives that may ultimately enter receiving waters. Colchester does not have a "bare roads" policy. The application of de-icers is limited to specific phases of storms and types of weather conditions. During snow events, de-icers are applied when precipitation is beginning to prevent compaction and bonding of snow to the roadway. Under ordinary circumstances, de-icers will not be applied again until the storm has ended to restore the paved surface. To avoid excessive use of de-icers, these materials are not applied at temperatures below their optimal effectiveness range. During freezing rain, or ice storms, de-icers are applied as needed throughout the entire storm event.

The use of abrasives is limited to non-paved roads in rural sections of the community, and paved roads when temperatures are too low for de-icers. The application of abrasives on paved roads is typically limited to critical areas such as steep grades, sharp corners and roadway intersections.

All primary snow removal equipment operated by the Town is equipped with on-board computers that control and regulate the application rates of materials. The Town operates no snow storage areas.

De-icers are stored in an enclosed facility. Abrasives are stored in an open pile on the ground at the Public Works Maintenance Facility. Minimal amounts of de-icers are added to the stock pile to prevent freezing. A silt fence is erected and maintained around the stock pile and an earthen berm and vegetative buffer strip has been constructed at the downstream end of the site.

Street Sweeping – The Town owns its own street sweeper. The equipment removes debris from the roadways by vacuum which reduces airborne dust. Town roads are cleaned both in the spring and fall of the year.

Basin Cleaning – Stormwater basins are currently cleaned on an as needed basis. Emphasis is placed on stormwater basins located on steep grades, and structures located near outfalls to receiving waters. Basins are inspected during cleaning.

Stormwater Outfalls – The Town has inventoried, assessed and mapped all of its stormwater outfall structures. These structures have been placed on a regular inspection schedule as outlined in the Town's Stormwater Outfall Assessment Program. Inspection forms are used to record any damage or signs of failure. Observations of flow characteristics are also recorded.

Drainage Ways – Roadside ditches and drainage ways are inspected routinely during other highway maintenance operations such as street sweeping, grading of gravel roads and roadside mowing. Solid wastes are removed from these drainage ways annually as a part of the Town's Green-up day activities. Roadside mowing is completed 3-4 times per year, or as needed, to keep the drainage ways clear. Regrading of drainage ways is only done on an as-needed basis to minimize any unnecessary soil disturbance.

Dust Control – Dust control material for gravel roads is limited to one application per year. Diluted liquid chloride is used for dust control. Applications are carefully applied to avoid any overspray into roadside drainage ways. The application of dust control material is coordinated with weather conditions to avoid excessive runoff into drainage ways.

Material Storage – Construction materials are stored within the Public Works Maintenance Facility yard. An earthen berm and vegetative buffer strip has been constructed at the lower end of the site to prevent any runoff or discharge of sediment from the site.

The Public Works Department has adopted a Materials Handling Policy that describes procedures for handling material collected during street sweeping, catch basin and stormwater pipe cleaning, and stormwater pond maintenance. The most recent version of this policy (November 2019) can be found as Appendix I to this document.

Buildings and Grounds Maintenance:

Sanitary Facilities and Wastes – All Town facilities and primary parks are equipped with bathroom facilities. All facilities are served by on-site wastewater systems, which are pumped and inspected every two to three years depending on the facility and size of tank.

Solid Wastes – All solid wastes from Town facilities are removed regularly on a contractual basis. Solid wastes from park lands are collected daily by Town maintenance crews. All solid wastes are properly disposed of in approved landfills.

Stormwater Runoff – Most Town facilities are located on relatively flat ground where no concentrated discharge occurs. On facilities that have concentrated discharges, a mixture of BMP's including grass lined swales, stormwater ponds, stormwater control berms and vegetative buffer strips are used. These controls are monitored regularly during grounds maintenance operations.

Fertilization – All types and quantities of fertilizers applied to Town owned grounds are in compliance to all state and federal guidelines regulating the use of fertilizers. To prevent over application of phosphorus, soil tests are conducted in advance of applications. Nitrogen is controlled through the use of slow release materials which allow the nitrogen to be used by the soil before reaching ground water. Fertilizers are applied primarily to athletic fields with general open space receiving only limited applications. Any over spray of fertilizers onto impervious surfaces are swept off after each application. Fertilizers are only purchased on an as-needed basis, and are stored inside under cover within approved containers before application.

Pesticides – All types and quantities of pesticides applied to Town owned grounds are in compliance to all state and federal guidelines regulating the use of pesticides. The Town uses Integrated Pest Management within its pesticide program for Town owned grounds. This involves testing of soils before applications to determine whether the application of pesticides is necessary.

Any over spray of pesticides onto impervious surfaces are swept off after each application. Pesticides are only purchased on an as-needed basis, and are stored inside under cover within approved containers before application.

Animal Waste – Town parks and recreational paths are equipped with supplies to allow pet owners to remove and dispose of pet waste within Town parks.

Equipment Maintenance:

Equipment Repair – All Town owned equipment is maintained and repaired within the Town's Public Works Maintenance Facility. Waste oils are collected and burned within an approved waste oil furnace within the maintenance facility. Coolants are recycled through equipment at the facility. All uniforms and rags that may be contaminated with oils, greases and other materials are collected within approved containers and cleaned on a contractual basis by an industrial cleaner. All other solid wastes, including batteries, discarded parts, and oil absorption materials, are collected and stored in approved containers, and disposed of at the appropriate facilities. Where fluids are stored that may be subject to accidental spills, double containment is provided. Aerosol products are managed to minimize the number of containers actively in use within the shop area.

Equipment Storage – The majority of the Town's equipment is stored inside. The Town operates a Capital Equipment Program that allows all equipment to

be replaced on a regular basis. Together with the facilities computerized work order and maintenance systems, the Town's equipment is in very good condition, and is generally free of fluid leaks, rust, paint flakes and other possible contaminates that may be washed from the site during stormwater flow conditions.

Equipment Washing – The facilities floor drains are connected to an oil and grease/water separator, which is connected to a holding tank. The tank is pumped on an as-needed basis, with the material disposed of in the Town's sewer system. The washing area outside is located such that wash water runs to a vegetated area and dissipates into the ground. Total outside equipment washing does not exceed thirty vehicles per week. There is no steam cleaning or engine degreasing performed during outside equipment washing.

Fueling Facility – The Town's fueling facility is served by two UST's with secondary containment. The facility is covered by a fueling canopy to avoid the collection of rain water and subsequent run off from the fueling pad. The fueling pad is slightly elevated to avoid contact from any other site run off that may be directed to the pad. The overall site is graded such that runoff is not directed toward the pad. The fueling system is equipped with both spill and vapor recovery systems. The system is also equipped with an electronic monitoring system that automatically reports fuel levels on a daily basis, and is equipped with an audible alarm connected to a leak detection system.

Wastewater System Maintenance:

Overflow Controls – All Town wastewater pumping stations are equipped with either auxiliary power capability, or emergency storage to prevent overflow conditions. All waste water pumping stations are inspected daily. In the event of an over flow, all practical steps are taken to prevent a discharge including but not limited to, erecting containment systems, flow diversion or emergency pumping and tanker truck operations.

Chemical Pre-treatment – All pumping stations equipped with chemical pre-treatment systems store their chemicals in above ground double containment tanks. All waste water pumping stations are inspected daily to ensure both the normal operation of the facilities, as well as the integrity of chemical storage tanks and other systems. Any problems are either repaired immediately by maintenance personnel, or if immediate repairs are not possible, reported to the Public Works Operations Manager to develop and implement a repair plan.

BMP 6-C *<u>For municipal facilities where fertilizers are applied, prohibit the use of fertilizers containing phosphorus unless warranted by a soil test</u>* - All types and

quantities of fertilizers applied to Town owned grounds are in compliance to all state and federal guidelines regulating the use of fertilizers. To prevent over application of phosphorus, soil tests are conducted in advance of applications. Nitrogen is controlled through the use of slow release materials which allow the nitrogen to be used by the soil before reaching ground water. Fertilizers are applied primarily to athletic fields with general open space receiving only limited applications. Any over spray of fertilizers onto impervious surfaces are swept off after each application. Fertilizers are only purchased on an as-needed basis, and are stored inside under cover within approved containers before application.

BMP 6-D *For municipal garages, an MS4 may participate in ANR's Municipal Compliance Assistance Program* - On September 19, 2010, John Daly, Environmental Assistance Specialist within the Vermont Department of Environmental Conservation, conducted an inspection of the Town's Public Works Maintenance Facility. The Town is in compliance with each of the Direct Compliance Issues identified in the report. Spent diesel and gas fuel filters are being disposed of as outlined. The Town discontinued the use of clay absorbents several years ago. The Town has previously tested its sand blast waste for heavy metals with negative results. No changes in procedures or materials have been made since that time. Debris from both street sweeping and catch basin cleaning is currently being stored on site at the maintenance facility. The charges from landfills to accept the material as cover material have become cost prohibitive. Subsequently, the Town has had these materials tested and determined that they can be safely disposed of at alternative sites. The Town intends to continue working with the MCAP to ensure continued compliance.

BMP 6-E *Provide a list of all industrial facilities that the MS4 owns or operates that are subject to the MSGP* – Currently there are none. The Town understands from the VANR Legal Council that MSGP's are not required for Public Works Garages. The Town has however completed several improvements which would be required under a MSGP if one were required. These include the covering of construction materials such as asphalt, manhole frames and covers, and scrap metal. The sand blasting area has been paved to facilitate the cleanup of the waste material after each occurrence. A holding tank has been installed which is connected to the floor drains within the maintenance facility to capture wash water associated with cleaning equipment. The waste water is periodically removed and discharged into the Town's municipal sewer system. Voters of Colchester approved bonds to allow improvements to several Town buildings, including $750,000 for the Public Works Maintenance Facility. As a part of this project, a 3,720 square foot cold storage facility has been constructed, allowing

much of the Town's equipment and construction materials to be placed under cover. This project also included the replacement of an aging salt storage facility.

BMP 6-F Copy of O&M program – Please see Section 6.1 of this document.

Rationale

The BMP's identified under this minimum control measure are aimed primarily at improving the nutrient index within receiving waters by reducing the discharge of phosphorous and nitrogen, and improving the total number of species and species density by reducing the discharge of sediment and toxins that can be generated by municipal operations.

There were no major alternative BMP's under this minimum control measure. Measurable Goals include documenting staff training hours within Annual Reports; annually documenting the volume of material removed from the stormwater system through catch basin cleaning and street sweeping; and providing a copy of soil tests completed prior to the application of pesticides as a part of municipal operations.

The implementation of this measure will require an increased level of awareness on the part of public employees of how the Town's municipal operation can contribute to water quality both positively and negatively.

The expected water quality outcomes under this minimum control measure are improvements in the nutrient index, total species numbers, and species density within receiving waters through the reduction of phosphorus, nitrogen, sediment and toxins in stormwater runoff.

Department of Public Works

Procedure for Handling Material Collected During Street Sweeping, Catch Basin and Stormwater Pipe Cleaning, and Stormwater Pond Maintenance

Last Updated March 19, 2020

Introduction

The Town of Colchester Department of Public Works (DPW) regularly uses a vacuum assisted street sweeper to remove sediment and debris from all curbed streets in the Town. The DPW also uses a vacuum assisted street sweeper and occasionally contracts a vacuum truck to clean stormwater drainage pipes and remove accumulated sediment from catch basin (a.k.a. storm drain) sumps. In addition, DPW staff is responsible for maintaining stormwater detention ponds on Town property. Pond maintenance includes the removal of accumulated sediment from these ponds and their associated forebays.

Regular completion of these activities is a requirement of the Town's Municipal Separate Storm Sewer System (MS4) permit, which is administered by the State of Vermont Agency of Natural Resources (ANR) Department of Environmental Conservation (DEC). Once collected, materials removed from streets and catch basin sumps are regulated under the Solid Waste Management Rules promulgated by the Vermont ANR DEC. Materials removed from stormwater treatment ponds are not regulated by the Vermont ANR DEC. This procedure provides Colchester DPW employees with guidelines for the storage, handling, testing, and disposal of these materials.

Storage

All materials collected during street sweeping, stormwater pipe cleaning, catch basin cleaning, and pond maintenance activities will be stored at the DPW facility at 711 Blakely Rd. Materials collected during street sweeping will be stored in a separate pile from materials collected during stormwater pipe and catch basin cleaning activities. Materials collected during pond maintenance will also be stored in a separate pile. Any collected material that shows signs of potential pollution will be stored in a separate pile so that it does not contaminate the presumably "clean" piles collected during normal maintenance activities. If the materials show obvious signs of pollution, they will be removed offsite in accordance with applicable regulations. The materials that show signs of potential pollution will be tested separately from the presumably "clean" materials using the testing procedures described below.

The material storage area will be maintained to ensure that collected materials do not become a source of pollution. Piles will be confined using concrete barriers, silt fence, earth berms, and/or hay bales to ensure that sediment laden runoff does not leave the storage area.

Testing

Materials collected as part of street sweeping activities do not require testing before they can be used as indicated below. When unloading the sweeper, the amount of material collected shall be estimated and recorded for reporting in the Town's MS4 annual report submitted to Vermont ANR DEC. Immediately following unloading of the sweeper, a visual inspection will be performed of the collected material and any trash removed. Prior to loading of material to be hauled away for final disposition, another visual inspection will be conducted and any trash removed.

Materials collected as part of stormwater drainage pipe and catch basin cleaning must be tested for Volatile Organic Compounds (VOCs) using either EPA method 8021B or 8260B prior to being used as indicated below. A composite sample will be collected from the pile of collected materials and sent to a lab for analysis on an annual basis. Results will be compared to the Primary Groundwater Quality Standards (enforcement standards) located in Appendix A of the Vermont ANR DEC Groundwater Protection Rule and Strategy. Using the EPA methods described above, the lower detection limits for some of these compounds in soil samples does not reach the levels specified in the Groundwater Rule (e.g. the lower detection limit for benzene in a soil sample is 13 ug/Kg and the Groundwater Standard is 5 ug/L). A sample whose result is at the lower detection limit of the methods specified will be considered a "non-detect".

Materials collected as part of stormwater pond maintenance activities will be tested using the same procedure as specified above for materials collected from catch basin and pipe cleaning. While these materials are not regulated by the Vermont ANR DEC, the Town feels that this extra precaution is prudent until such time as we have collected enough data to feel confident that these materials do not pose a significant threat to the environment when used as specified below.

As materials from catch basins, drainage pipes, and stormwater ponds are brought into the storage area, quantities will be estimated and recorded and they will be visually inspected and all trash removed. Generally speaking, the materials will be stockpiled all year long and the stockpiles will be tested annually following the spring street sweeping efforts. Once materials have been confirmed to be below the thresholds identified in the Groundwater Protection Rule, another visual inspection will be conducted while loading material out for final disposition. The storage area is currently able to store about one year's worth of collected materials. Materials may be inspected, tested, and moved to a separate fill pile as necessary to ensure that the material storage area has enough space for new materials. The estimated amount of material collected shall be reported in the Town's MS4 annual report submitted to Vermont ANR DEC.

Procedure for Material Containing VOCs

Materials tested using EPA method 8021B or 8260B that show VOC levels exceeding the Groundwater Quality Standards in the Vermont Groundwater Protection Rule will be moved to a separate location for storage. Compost, manure or another material high in organic matter will be blended into collected materials and they will sit for a minimum of 6 months before being re-tested. These piles will be "turned" regularly during this time. If these materials fail a second test they will be turned and blended again. A third test will take place at least a year from the second failed test. If the third fails, these materials will be landfilled.

Use of Collected Material

Once inspected and tested, all materials can be used as common fill by the DPW or others who receive permission from the Town. Alternatively, these materials can be blended with other materials (e.g. compost, manure) to create top soil or tree planting material for use by the DPW or others who receive permission from the town. Depending on the use of the material, screening may be necessary to separate the soil from larger inappropriate litter.

Policy Review and Schedule for Update

This plan will be updated as necessary to comply with State regulation, or to fit changing circumstances at the DPW facility. At a minimum, this policy will be reviewed once every 5 years when the Town's Stormwater Management Plan is revised as part of the MS4 permit application.