



Town of Essex
Stormwater Management Plan

Submitted March 26, 2024

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Introduction

This Stormwater Management Plan (SWMP) documents the Town of Essex's strategy to address and reduce the impact of stormwater runoff as required by the Vermont Municipal Separate Storm Sewer System (MS4) permit #3-9014 issued September 28, 2023. This plan contains the required elements described in the 2023 Vermont MS4 permit including what measures will be taken that will reduce the discharge of pollutants to the maximum extent practicable, to protect water quality, and to satisfy the appropriate requirements of the Clean Water Act (CWA) and the Vermont Water Quality Standards.

Watersheds in the Town

The Town contains six different watersheds within its boundaries. Of the six, two of these watersheds are stormwater impaired due to excess flow. In September 2008, TMDLs were established for these two stormwater impaired waterways – Indian Brook (VT05-09) and Sunderland Brook (VT08-02). Copies are included in *Appendix A*. This SWMP not only works to remove these impairments but also maintain the non-impairments status of the remaining four watersheds which include the Winooski River, Alder Brook, Browns River, and Abbey Brook. A map of the watersheds in the Town are included in *Appendix B*.

Indian Brook is the third largest watershed in the Town with a watershed area of 12 square miles and covers approximately 20.2% of the total drainage area. The westerly edge of the watershed extends into Colchester and southerly edge into Essex Junction. Indian Brook Reservoir is the largest waterbody in the watershed. Indian Brook flows south into Essex Junction, west into Essex, and continues west into Colchester. The State has designated this watershed impaired by stormwater flow due to the non-support of aquatic life designated uses.

This watershed is a mix of different land uses. The TMDL indicates that the land breakdown in the watershed is 39% developed lands, 43% forested land or wetlands and 18% agricultural lands. The majority of the residential and commercial development is located in the southerly portion of the watershed adjacent to Route 15 in the Town and City of Essex Junction and the Circumferential Highway.

Sunderland Brook has a watershed area of approximately 5.5 square miles. The headwaters of Sunderland Brook originate in highly developed areas adjacent to Route 15 in Essex Junction. The west edge is bounded by Colchester and the southerly edge by Essex Junction. The State has designated this watershed impaired by stormwater flow due to the non-support of aquatic life designated uses.

This watershed area consists primarily of residential and commercial uses which are significant portions of the total watershed area. The southerly portion of Susie Wilson Road and Kellogg Road in the Town and Pearl Street in the City of Essex Junction extend through this watershed area. According to the TMDL, 76% is developed land, 4% agricultural land, and 20% forested land.

Part 6: Minimum Measures (MM)

The Town will comply with the six minimum measures identified in the VT MS4 permit as outlined in the tables below.

MM 1: Public Education & Outreach

BMP	Timeframe	Measurable Goal	Rationale	Partner
a) Participate in a regional stormwater education strategy or develop an MS4 specific program	Ongoing	Participate in and provide financial support for operation of the regional Rethink Runoff campaign consisting generally of periodic advertising throughout each year supplemented by a survey of residents every 5 years to track reported behavior with regards to residential stormwater BMPs via an annual report provided by the Chittenden County RPC's subcontractor. The permittee will document annual number of site visits to www.rethinkrunoff.org as well as other metrics.	Support of the campaign will educate the general public in the MS4 area about key stormwater quality issues by using TV, radio, online media placements/advertising to drive viewers to the www.rethinkinrunoff.org website.	Town in collaboration with the CCRPC
b) Create educational brochure about pet waste & water quality	January 2025	Number of brochures handed out	Providing a display at the Clerk's office will offer education to pet owners on the effect of pet waste on water quality through the daily interaction the Clerk's office has with residents especially during annual dog license renewal	
c) Provide biodegradable pet waste bags to community	Ongoing	Number of bags purchased or distributed	Providing pet waste bags to residents make it easy to pick up after their pets and allows the opportunity for water quality education by having information signage or brochures included with the bags.	

MM 1: Public Education & Outreach Continued

BMP	Timeframe	Measurable Goal	Rationale
d) Install pet waste dispensers	As determined necessary	Number of pet waste dispensers	Providing residents with an area to dispose of pet waste in high pet activity areas encourages them to pick up after their pets by being able to dispose of the waste easily while walking, keeping the pollutant out of the watershed.
e) Install signs with the message to “pick up after your pet”	As determined necessary	Number of signs	Providing education to pet owners on the effect of pet waste on water quality, focusing on high pet activity areas
f) Update website to contain current stormwater & water quality information	Ongoing; At minimum semi-annually	Number of updates made; Number of visits to the website	Providing a central location for the community to go to gather education on stormwater and water quality issues, events, projects occurring in the municipalities. Town’s website for stormwater information is located at www.essexvt.org/212/Stormwater
g) Provide a water quality table at annual Town meeting	Annually	Number people reached and directly spoken to	Providing the community with stormwater and water quality information, issues, events, projects occurring in the municipalities
h) Provide educational talks about the importance of water quality	Ongoing	Number of classroom visits, Number of students	To educate the public about the importance of water quality and how individual actions can make a difference.
i) Review of Stormwater Ordinance to ensure consistency with LID practices as they apply to community and compliance goals	By 2025	Number of updates made to the Ordinance	To encourage and/or require residents, developers, and businesses to implement LID practices through codes and ordinances reducing stormwater runoff and improving water quality.
j) Review of site plans to ensure incorporation of LID and BMPs in compliance with local regulation	Ongoing	Number of site plans reviewed	To encourage LID in new or redevelopment projects wherever practicable to reduce stormwater runoff and improve water quality.

k) Incorporate LID into municipal projects	Ongoing	Number of projects retrofitted	Encourage through municipal engineers or consultants the implementation of LID in new or redevelopment projects to achieve reduction in stormwater runoff.	
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MM 2: Public Participation & Involvement

BMP	Timeframe	Measurable Goal	Rationale	Partner
a) Participate in a regional stormwater public involvement and participation strategy or develop an MS4 specific program	Ongoing	The permittee will participate in and provide financial support for operation of the Rethink Runoff Stream Team consisting generally of both outreach and hands-on participation events in various MS4 towns on a rotating annual basis 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.	Through support of the Stream Team, the regional campaign's "action arm", the permittee will support the engagement of local residents in the MS4 area via outreach events and via hands-on participation events.	Town in collaboration with the CCRPC
b) Participate in Vermont Green-up Day or organize stream clean-up day	Annually	Report tons of trash and other materials collected	Encourage & educate residents about the importance of stream corridor health and its relation to water quality	

MM 3: Illicit Discharge Detection and Elimination

- Monitoring of illicit discharges will comply with Section 9.1 of the 2023 MS4 Permit.

BMP	Timeframe	Measurable Goal	Rationale
a) Maintain & improve storm sewer GIS map	Ongoing	Number of outfalls field verified; Number of map updates made	Updated storm sewer maps will ensure efficiency in identifying illicit discharges. Maps will be updated by the Town GIS Coordinator with assistance by summer interns through inspections and development applications and issued permits.

b) Review of Stormwater Ordinance to effectively prohibit illicit discharge	By 2025	Status report of proposed changes & approved changes to local regulation	Ensure that appropriate procedures and actions are in place to prohibit illicit discharges into the MS4 system and a timeframe for eliminating illicit discharges and connections.
c) Review IDDE document & program	Annually	Status report of proposed changes & approved changes to local regulation	To improve water quality through an effective, proactive, and current IDDE program

MM 3: Illicit Discharge Detection and Elimination Continued

BMP	Timeframe	Measurable Goal	Rationale
d) Provide education materials related to hazards associated with illicit discharges	Ongoing	Number of door tags placed; Number of IDDE brochures handed out; Number of public notices	To educate residents about the hazard of illicit discharge, importance of proper disposal of waste and protect water quality
e) Illicit Discharge Detection & Elimination Program	Ongoing	Number of discoveries or complaints; Number resolved; Number of water quality test conducted, or samples collected; number of outfalls tested for dry weather field screening annually.	To improve water quality through an effective, proactive, and current IDDE program. Selected chemical parameters for dry weather field screening include but shall not be limited to: Temperature, pH, Ammonia, Bacteria, and Chlorine

MM 4: Construction Site Stormwater Control

BMP	Timeframe	Measurable Goal	Rationale
a) Inspect construction sites for compliance with stormwater construction permits	Ongoing	Number of construction site inspections	To ensure construction projects are in compliance with their State or local stormwater construction permits and are properly protecting water quality.
b) Review existing policies, codes & ordinances to ensure compliance with State/federal requirements in relation to construction activities and erosion control/stormwater mitigation	Ongoing	Status report of proposed changes & approved changes to local regulation	Determine the effectiveness in managing construction related erosion and stormwater control; Ensure consistency with State's general stormwater permit

c) Review existing policies, codes, ordinances to ensure projects <u>below</u> State/Federal jurisdiction are covered in relation to construction site erosion control activities/ stormwater mitigation	Ongoing	Status report of proposed changes & approved changes to local regulation	Protect water quality through effective management of construction related erosion and stormwater
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MM 4: Construction Site Stormwater Control Continued

BMP	Timeframe	Measurable Goal	Rationale
d) Provide erosion control brochures to zoning permit applicants	Ongoing	Number of brochures handed out	To inform residents about simple practices they can implement to reduce amount of erosion during construction projects improving water quality
e) Review of development applications for adherence to erosion and sediment control requirements	Ongoing	Number of site plan reviews for erosion and sediment control	To ensure appropriate erosion and sediment control measures are in place to reduce potential water quality impacts.

MM 5: Post-Construction Stormwater Management for New Development and Redevelopment

BMP	Timeframe	Measurable Goal	Rationale
a) Inspect post-construction sites for compliance with stormwater stabilization control requirements	Ongoing	Number of post-construction site inspections conducted	To ensure post-construction sites are in compliance with State & municipal site stabilization requirements improving water quality
b) Review existing policies, planning, zoning, subdivision regulations & ordinances to assess whether changes can be made to support LID options	Ongoing	Status report of proposed changes & approved changes to local regulation	To determine their effectiveness to support LID options including street and parking requirements; To ensure their consistency with their requirements with State rules and general permits and to identify gaps.

MM 6: Pollution Prevention and Good Housekeeping for Municipal Operations

BMP	Timeframe	Measurable Goal	Rationale
a) Inspect catch basins	Annually	Number of catch basins inspected and cleaned; Amount of material removed in yards	Periodic inspections will ensure that the stormwater system is functioning properly and will reduce the number of pollutants entering waterways
b) Conduct street sweeping	Spring/Fall/ As needed	Number of lane miles swept; Yards	To reduce the amount of sediment and pollutants (including phosphorus) entering the MS4 stormwater system

		of material collected	
c) Inspect outfalls	Annually	Number of outfalls inspected	Periodic inspections will ensure that the stormwater system is functioning properly and will reduce the number of pollutants entering waterways

MM 6: Pollution Prevention and Good Housekeeping for Municipal Operations Continued

BMP	Timeframe	Measurable Goal	Rationale
d) Inspect MS4 permitted infrastructure	Annually	Number of STP inspections; Number of STPs maintained	Regular inspections will ensure that the stormwater system is functioning properly and will reduce the number of pollutants entering waterways
e) Installation of STPs	Annually	Number of STPs installed	To comply with State approved Indian Brook & Sunderland Brook FRPs including the TMDLs for Indian & Sunderland Brooks
f) Installation of retrofitted STPs	Annually	Number of STPs retrofitted	To comply with State approved Indian Brook & Sunderland Brook FRPs including the TMDLs for Indian & Sunderland Brooks
g) Inventory & Installation of “No Dumping, Drains to Waterways” markers or painted stencils on catch basins	Annually	Number of “No Dumping, Drains to Waterways” markers installed; Number of basins stenciled	To bring awareness to residents about the MS4 separate stormwater system and its direct connection to water quality
h) Participation in proper disposal of hazardous waste in compliance with CSWD requirements	Ongoing	Provide documentation of compliance; Tons of waste disposed	Incorporate into illicit discharge procedures, regulations & program
i) Continue to prohibit use of phosphorus containing fertilizers on facility operations unless warranted by a soil test.	Ongoing	Number of educational materials provided	To reduce amount of phosphorus in the watershed
l) Develop budget for stormwater permit compliance including BMP implementation	Annually	Annual stormwater operating budget by Fiscal Year	To invest money into a stormwater infrastructure maintenance program with best Asset Management practices
m) Participate in stormwater training for staff	Annually	Number of credit hours/classes attended	Participate in regional, local, and national stormwater and water quality trainings to be informed on new techniques and polices

Reliance on the State’s Construction General Permit: The Town will rely on the State’s Construction General Permit process for site plan review and receiving public comments on erosion protection and sediment control for MM4 – Construction Site Stormwater Runoff Control.

Construction site inspections will take place at the start of construction, before/after any major storm event, and after any notice of violation. Under the Town’s Standard Specifications for Construction, the Town may require the project developer to have a qualified engineer or Certified Professional in Erosion and Sediment Control to provide documentation to the Town that proper erosion prevention and sediment control measures were installed during construction and to increase the level of inspection based upon the complexity of construction.

Six Minimum Measures BMP Alternatives Considered: It is the purpose of this application to define what beneficial stormwater actions will be taken. The list of potential BMPs that could have been selected has no boundaries and the answer to the question of which BMPs were not selected is essentially infinite in scope. The Town has identified specific BMPs that exceed the minimum permit requirements (in the tables above). If the regulatory agencies determine that additional BMPs should be evaluated for inclusion in the plan, these BMPs should be identified by the regulatory agencies and either considered or rejected by the communities with a rationale for the decision.

Part 7: Assumption of Responsibility for Previously Permitted Stormwater Systems

As per the Notice of Intent recently submitted to the State, the Town will be incorporating the following 9010 and 9050 stormwater permits that are located in the unimpaired waterways under the MS4 Permit:

- 5263-9050: Birchwood Land Company
- 4181-9050.2: Saxon Hill Industrial Park
- 3585-9010.T: Saxon Hill Industrial Park – Corporate Drive

Stormwater Treatment Practices Owned by the Town

A list of all previously permitted stormwater systems that the Town has assumed “full legal responsibility” and have been incorporated under the Town’s authorization are included in *Appendix E*. The Town will inspect these systems and provide an operation and maintenance report to the State with the annual report.

Three-Acre Permits

The Town is a co-permittee on two operational stormwater permits that are subject to the three-acre permit:

- 3790-9050: Oakridge
- 3426-9050: Pinewood Section H

The Town will work with the co-permittees to meet the requirements of the three-acre permit.

Lake Champlain Total Maximum Daily Load (TMDL)

Excess phosphorus from the various sources across the landscape have caused the water quality of Lake Champlain to become impaired. In 2002, Vermont prepared a plan to reduce phosphorus loadings

through the development of an EPA mandated TMDL, placing a cap on the maximum amount of phosphorus allowed to enter the Lake and still meet Vermont Water Quality Standards. This plan was appealed by lawsuit by EPA in 2011. On June 17, 2016, the Environmental Protection Agency (EPA) approved a new phosphorus TMDL for twelve Vermont segments of Lake Champlain. The percentage reduction required from developed lands per Lake Segment is included in *Appendix I*. The Town falls under the Main Lake and Mallets Bay Lake Segments and will be required to reduce phosphorus from developed land by 20.2% and 20.5% respectively.

The following section of this SWMP outlines the approach the Town plans to use to work towards achieving the percent reduction in phosphorus from developed lands.

Part 8: TMDL IMPLEMENTATION

Flow Restoration Plans

The Town submitted Flow Restoration Plans to the State in October 2016 which the State accepted on January 30, 2017. A copy of the State's acceptance letter and approved FRPs are included in *Appendix F*, *Appendix G*, and *Appendix J*. Under the Sunderland FRP and State of Vermont Criteria, the high flow target is currently being met and no additional BMPs for flow are required in the watershed. TMDL compliance determination is pending State microbiological testing of the waterway.

The Indian Brook FRP identified 4 projects that are required to meet and exceed the high flow target which are identified below:

- Sydney Drive Stormwater Pond Retrofit (Town) – completed in 2020
- Brickyard Gravel Wetland (City of Essex Junction) – completed in 2020
- LDS Church Stormwater Pond Retrofit (Town)
- Fairview/Mansfield Gravel Wetland (City of Essex Junction) – completed in 2019

The LDS Church Stormwater Pond Retrofit is the final project needed to meet the requirements of the Indian Brook FRP. The Town has secured funding through various grant programs for this project which is on schedule for construction to be completed by 2025. The Town will submit a report annually on April 1st to the State addressing the actions taken to implement all FRP components. These projects have been modified to reduce phosphorus as well as meeting the FRP requirements. With these projects fully implemented, the FRP high flow minimum requirement will be exceeded by approximately 212%.

The Town shall implement the measures necessary to achieve the flow restoration targets in the stormwater TMDLs using the FRPs developed no later than December 5, 2032.

Flow Monitoring

The State notified the MS4 communities in 2021 that the flow monitoring requirements required in the 2018 MS4 were fulfilled, and that additional flow monitoring was not required. The Town was of the opinion that collecting additional flow data would be useful in assessing compliance towards meeting the TMDLs once the FRP projects were implemented. In 2022, the Town contracted with Stone Environmental to continue flow monitoring on Indian Brook for 3 years. A copy of the contract is included in *Appendix G*.

Stream Corridor Protection

The 2012 MS4 general permit required that the Town report on legal authorities or strategies the Town has adopted to protect and regulate development in the stream corridors of stormwater impaired waters including developing a plan for enhanced stream corridor protection. In accordance with the

2023 MS4 permit, the Town will report any updates to the plan including link to relevant ordinances or regulations as part of the annual compliance report due April 1.

8.2 Lake Champlain Phosphorus Control Plans (PCP) Requirements

The Town developed a joint Phosphorus Control Plan (PCP) in collaboration with the City of Essex Junction. The plan was designed to achieve the level of phosphorus reduction equivalent to the percent reduction targets for municipally owned developed lands in the Main Lake and Malletts Bay Lake segments in *Appendix I*. The PCP was submitted to the State on April 1, 2021, and approved by the State on April 22, 2022. An updated copy of the PCP is included in *Appendix J*.

The document will remain a working document and subject to change as projects are further investigated. The Town shall implement the measures necessary to achieve the phosphorus reduction targets outlined in the Lake Champlain Phosphorus TMDL using the PCP developed no later than June 17, 2036.

An annual report will be submitted to the State providing a status update on the implementation of the PCP.

Municipal Roads Requirements

The Town will work with the Chittenden County Regional Planning Commission (CCRPC) to update the Road Erosion Inventory (REI) of all hydrologically connected road segments by April 1, 2028.

The Town will submit an annual report which will include an update on how many hydrologically connected road segments were brought up to standards in the past year. The report will also identify which segments are planned to be upgraded the following calendar year in the Implementation table.

Part 9: Monitoring, Record Keeping, and Reporting

The Town will comply with all monitoring, record keeping, and reporting requirements as outlined in Part 9 of the 2023 MS4 permit including internal review of the SWMP.

Part 10: Standard Permit Conditions

10.8 Signatures Requirements

“I certify under the 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 personal 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, the information submitted is, to the best of my knowledge and believe, 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.”

Greg Duggan, Town Manager

Aaron Martin, P.E., Public Work Director

Annie Costandi, P.E., Water Quality Director

Appendices Table

Appendix A: Indian Brook and Sunderland Brook TMDL Reports

Appendix B: Map of the Watersheds in the Town

Appendix C: Stormwater Program Agreement between the MS4 Communities and the Chittenden County Regional Planning Commission for Rethink Runoff

Appendix D: Stormwater Ordinance including 2014 Expired Permit Additions

Link to entire document: https://www.essex.org/index.asp?SEC=B1514A56-E23E-43B7-9195-5ED284507A8F&Type=B_BASIC

Appendix E: List of Stormwater Treatment Practices the Town has assumed “Full Legal Responsibility”

Appendix F: VT DEC MS4 Permit Authorization incorporating the FRPs and Expired Permits for the Town of Essex and VT DEC MS4 Permit Authorization incorporating the PCP under the SWMP for the Town of Essex

Appendix G: Flow Monitoring Contract with Stone

Appendix H: Developed Lands Phosphorus Reduction Requirements by Lake Segment

Appendix I: Indian Brook Flow Restoration Plan

Appendix J: Sunderland Brook Flow Restoration Plan

Appendix K: Phosphorus Control Plan