City of Essex Junction

Stormwater Management Plan

Submitted March 26, 2024

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INTRODUCTION

This Stormwater Management plan (SWMP) documents the City of Essex Junction's (the City) 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.

Chelsea Mandigo, Water Quality Superintendent, is responsible for implementing and coordinating the SWMP, BMPs and the associated requirements outlined in this plan.

4.2.A Discharges to Impaired Waters with an Approved Total Maximum Daily Load (TMDL)

In September 2008, TMDLs were established for Indian Brook (VT05-09) and Sunderland Brook (VT08-02) which were designated as stormwater impaired due to excess flow and non-support of aquatic life designated uses. Per Subpart 8.1 of the MS4 permit the City is to implement Flow Restoration Plans for the stormwater impaired streams *Appendix A*. For more information on the FRPs see Section 8 of this plan.

A map of the City's watersheds is included in *Appendix B*.

Part 6: MINIMUM MEASURES (MM)

The City is responsible for complying with the six minimum measures laid out in the VT MS4 permit. Below is an outline on how the compliance is planned to be achieved.

MM 1: Public Education & Outreach

BMP	Timeframe	Measurable Goal	Rationale
Participate in a regional stormwater education strategy or develop an MS4 specific program	Ongoing	Financial and participatory support provided for operation of the regional Rethink Runoff campaign consisting of periodic advertising throughout the year and a survey every 5 years to track residents' behavior with regards to residential stormwater BMPs. Survey is distributed 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 public, including landowners, about key stormwater quality issues by using TV, radio, online media placements/advertising to drive viewers to the Rethink Runoff website.
Provide biodegradable pet waste bags to community	Ongoing	Number of bags purchased	Providing pet waste bags with Rethink Runoff logo to residents encourages website visits to education program .

Website updates to stormwater & water quality information	Annually	List of updates made	Providing a central location for community education on stormwater and water quality issues, events, and projects occurring in the municipality, including links to Rethink Runoff and the Stream Team
Host educational talks on the importance of water quality including virtual or in-person tours of the Wastewater Treatment Facility	Ongoing	Number of classroom visits, tours given; number of education handouts distributed, Number of people reached	To educate the public about the difference between wastewater and stormwater management in the city and how individual actions can make a difference.

MM 2: Public Participation & Involvement

BMP	Timeframe	Measurable Goal	Rationale
Participate in a regional stormwater public involvement and participation strategy or develop an MS4 specific program	Ongoing	Participate in and provide financial support for operation of the Rethink Runoff Stream Team consisting 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 residents in the MS4 area via outreach events and via hands-on participation events.
Adopt-a-Drain program in which community members take responsibility for cleaning a storm drain	Ongoing	Attach Annual Report for Essex Junction provided by Adopt-a-drain which summarizes number of participates, amount of debris removed for a one-year period.	Creates awareness around stormwater management and provides an avenue for residents to be involved in the community and water quality initiatives

MM 3: Illicit Discharge Detection and Elimination

The City of Essex Junction has used the *EPA's Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments* by the Center for Watershed Protection and Robert Pitt, University of Alabama, as the basis for it IDDE program for several years.

Section 713C of the City of Essex Junction Land Development Code (LDC) houses the IDDE policy prohibiting non-stormwater discharges into the regulated MS4 system *Appendix C*. Section 1101B of LDC prohibits stormwater into the sanitary sewer system. The LDC also encompasses the enforcement of these policies. Over the next permit term, the City will be developing a Stormwater Ordinance and Sewer Ordinance which will encompass the IDDE policy, program outline and enforcement amongst other items. The relevant sections will be pulled from the LDC, updated and then incorporated by reference.

The City has approximately 195 outfalls that are part of the MS4. These outfalls are inspected every year to ensure functionality and condition. To ensure dry weather field screening of all outfalls is completed within the permit cycle, a list of 40 different outfalls/year will be compiled. The outfalls on the list for the given year will be dry weather field screened. If flow of water is found present during the dry weather inspection the outfall will be test for 1) E.coli 2) ammonia 3) chlorine and 4) optical brightener presence. It is important to note that sometimes outlet design prevents optical brightener to be feasible. All of the water quality tests will be conducted by City staff at the in-house laboratory located at the wastewater treatment facility.

If an illicit discharge is found an investigation will be launched to find the potential source. This investigation will include using the City's GIS map of the stormwater system to systematically move upstream from the positive source until a negative source is discovered or the source of origin is determined. Other tools that may be part of the investigation is to camera inspect the stormwater line, smoke test, or use a vacuum truck to clean the line.

Once an illicit discharge is found it will be eliminated as soon as feasibly possible regardless of source. If the source is a private property owner, a letter documenting the issue and remedy is sent with a timeline of compliance. If the property owner does not comply the City has the ability to charge a fee as laid out in the LDC.

Below are the BMP's that are part of the IDDE program with timeframe, measurable goals and rationale included for each.

BMP	**Timeframe**	**Measurable Goal**	**Rationale**
Maintain & improve storm sewer GIS map	Annually	Number of outfalls field verified; Number of map updates made	Partnering with CCPRC to update GIS map will ensure efficiency in identifying illicit discharges.
Provide education materials related to hazards associated with illicit discharges	Upon discovery	Number of door tags, brochures, and public notices distributed	To educate residents about the hazard of illicit discharge and importance of proper disposal of waste
Illicit Discharge Detection & Elimination Program	Ongoing	Number of discoveries or complaints; Number of incidents resolved; Number of outfalls tested for water quality parameters	To improve water quality through an effective and proactive IDDE program. Documenting location, issue, and resolution to determine if history of pattern or new area.

Program Evaluation and Assessment	Annually- at the end of field season	Summary of any changes made to the IDDE program after field season	To ensure a proactive and effective IDDE program, which changes to address any emerging issues

MM 4: Construction Site Stormwater Control

6.2.4.4 and 6.2.4.5 Section 514 and Section 515 of the LDC outline the City's erosion and sediment control requirements which defer to the State of Vermont's Construction General Permit (CGP) 3-9020 for Stormwater Runoff from Construction Sites; therefore, the City is deferring to this State CGP process to comply with this part of the MM4. Language will be added to the LDC and Stormwater Ordinance requiring a copy of the CGP be provided to the City as part of final project approval.

6.2.4.6 The City will add language to the LDC and Stormwater Ordinance that outlines the procedure for site inspection and enforcement of erosion control measures. It will also require that before a certificate of occupancy is issued a letter from the project engineer or other professional attesting to the proper installation of erosion control measures and stormwater treatment practices.

BMP	**Timeframe**	**Measurable Goal**	**Rationale**
a) Inspect construction sites for compliance with stormwater construction permits during 1) start of project 2) after a storm event 3) after a notice of violation	Ongoing-largely during construction months April-Oct	Number of construction site inspections, Number of issues found, Time it took for resolution/issue	To ensure construction projects follow 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/	2024	Summary of updates incorporated	Determine the effectiveness in managing construction related erosion and stormwater control; Ensure consistency with new MS4 permit requirements and State's general stormwater permit
d) Provide erosion control information to zoning permit applicants	Ongoing	Number of brochures or Low Risk Handbook handed out	To inform residents about simple practices they can implement to reduce amount of erosion during construction projects

MM 5: Post-Construction Stormwater Management for New Development and Redevelopment
Amendments to Section 719B were made in the 2023 update of the LDC encouraging Low Impact Design (LID) and Green Stormwater Best Management Practices to meet landscaping, parking lot, buffering, streetscaping and tree preservations code requirements.

Language will be added to the LDC and Stormwater Ordinance that will require reports of annual inspections of stormwater treatment practices to be sent to the Water Quality Superintendent.

BMP	Timeframe	Measurable Goal	Rationale
Inspect post-construction sites for compliance with stormwater stabilization control requirements	Ongoing	Number of post-construction site inspections conducted	To ensure post-construction sites follow State & municipal site stabilization requirements to improve water quality
Review 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.
Incorporate LID into municipal projects	Ongoing	Number of projects retrofitted	Encourage municipal engineers or consultant's implementation of LID in new or redevelopment projects to achieve reduction in stormwater runoff.
Review existing policies, codes & ordinances to encourage combination of structural, non-structural and LID in development projects	2024	Summary of changes made	Continue to encourage mixture of different stormwater management practices to allow flexibility to achieve the greatest water quality benefit from a development project

MM 6: Pollution Prevention and Good Housekeeping for Municipal Operations

BMP	Timeframe	Measurable Goal	Rationale
Inspect catch basins	Annually	Number of catch basins inspected; Amount of material removed (in yards)	Inspections will ensure that the stormwater system is functioning properly and reduce pollutants entering waterways
Conduct street sweeping	Spring/Fall/ As needed	Sum of Phosphorus load (kg/yr.) per lake segment captured by street sweeping activities	To reduce the amount of sediment and pollutants (including phosphorus) entering the stormwater system. The municipality makes every effort to follow the procedure outlined in the Clean Streets Report developed by UGSG and the State of Vermont. This focuses on sweeping the

			routes that have more than 17% canopy cover first in the fall before moving to the other routes.
Inspect outfalls	Annually	Number of outfalls inspected; number of outfalls maintained	Inspections will ensure that the stormwater system is functioning properly and reduce pollutants entering waterways
Inspect MS4 permitted infrastructure	Annually	Number of STP inspections; Number of STPs maintained	Inspections will ensure that the stormwater system is functioning properly and reduce pollutants entering waterways
Installation and retrofitting of STPs	Annually	Number of STPs installed and retrofitted	To comply with State-approved Indian Brook & Sunderland Brook FRPs including the TMDL's
Develop budget for stormwater permit compliance	Annually, Stormwater Utility being formed in 2024	Annual stormwater operating budget by Fiscal Year; utility rates	To invest money into a stormwater infrastructure maintenance program with best asset management practices
Develop stormwater capital plan	2025	Number of projects formed; Number of projects built	To compile a list of capital projects and associated costs needed to comply with the Lake Champlain TMDL, along with maintenance of existing stormwater management practices in the MS4.
Participate in stormwater training for staff	Annually	Number of credit hours	Participate in regional, local, and national stormwater and water quality trainings to be informed on new techniques and polices
Develop a stormwater ordinance	2024-2025	Existence of ordinance	To codify, consolidate, and publish all stormwater rules, regulations, and municipal intentions and projects

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 City 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

The City incorporated the following stormwater permits under the 2023 authorization of the MS4 Permit:

- 2-0317: Essex Park – Phase II (Note: already listed as permitted on State's SW expired permit excel sheet)
- 7778-INDS: Crescent Connector (Maple St/Railroad St/Park St)

The City previously incorporated the following expired or valid stormwater permits:

- 1-0236: Brickyard Rd/Upper Main St
- 2-0155: Essex Park Phase 3
- 2-0769: Athens Dr.
- 2-0952: Essex Park Condominiums
- 3268-9010: Woods End/Rivendell Dr.
- 4128-INDO: Hannaford Offset-Brookside Rd/Drury Dr/Upland Rd
- 1-0953: Drury Dr./Meadow Ter.
- 2-0187: Grove St./North St.
- 2-0835: Village Glen/Densmore Dr.
- 2-0961: Brookside Condominiums
- 3547-9010.R: Whitcomb I/II/III Combined
- 4989-INDO.R: Five Corners North
- 1-1074: Countryside II/Fairview Dr.
- 2-0289: Countryside Dr./Beech Rd.
- 2-0855: Village Knoll (Briar Lane)
- 2-1103: Pleasant St./East St.
- 3553-9010: Brownell Rd
- 6653-9015: Village Walk (unimpaired waterway, Winooski River)
- 6006-9020.1 INDS: Taft Street (Impaired waterway, Indian Brook)

Stormwater Treatment Practices Owned by MS4

Annually, City staff inspect the practices listed below for condition and functionality. All vortech units are cleaned with a vacuum truck regardless of amount of material accumulation. If other maintenance needs are discovered during inspections, an assessment of severity is conducted and a timeline for repair developed.

Stormwater Treatment Practice	System Name	Location	State Stormwater Permit
Vortech Unit/Flow Control	5 Corners North	Educational Dr/Central St	4989-INDO
Stormwater Wet Pond	Hawthorn SW Pond	Hawthorn Cir	7024-9014.A
Vortech Unit	Hawthorn	Hawthorn Cir	7024-9014.A
Dry Swale	Whitcomb Combined	South St	3547-9010.R
Vortech Unit	Upland/Drury	Brookside Ave	4128-INDO
Stormwater Pond	Village Walk	Kiln Rd Ext	7024-9014.I
Stormwater Pond	Whitcomb Combined	Dunbar Rd	3547-9010.R
Stormwater Pond	Whitcomb Combined	Ketchum Rd	3547-9010.R
Gravel wetland	Fairview Wetland	Fairview Dr	7024-9014.A
Gravel wetland	Mansfield Wetland	Mansfield Ave	7024-9014.A
Sand Filter	Crecent Connector	Railroad St	7788-INDS

Part 8: TMDL IMPLEMENTATION

8.1 Stormwater Flow Restoration Plan

The Sunderland Brook Flow Restoration Plan submitted and approved in July 2015 demonstrate compliance with the flow targets set in the Sunderland Brook TMDL based on projects already implemented in the watershed. Therefore, no further projects have been implemented in this watershed for flow restoration.

The Indian Brook Flow Restoration Plan submitted and approved indicated the need for implementation of four projects to meet flow targets. Three of the four projects have been completed. The remaining project is being built in 2025.

- The projects completed in the City that are part of this plan are:
  - Fairview Drive/ Main Street Gravel Wetland installed 2019.
  - Mansfield Rd/Brickyard Rd Gravel Wetland installed 2020.
- Sydney Drive Infiltration system installed 2020 in the Town of Essex was the third project completed.
- LDS Church SW practices is the remaining project located in the Town of Essex that is being built in 2025.

Sunderland FRP and an updated Indian Brook FRP can be found in *Appendix A.*

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 Environmental Protection Agency (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 EPA approved a new phosphorus TMDL for twelve Vermont segments of Lake Champlain. The percentage reduction required from developed lands was set per Lake Segment. The City 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 City plans to use to work towards achieving the percent reduction in phosphorus from developed lands.

8.2 Lake Champlain Phosphorus Control Plans (PCP) Requirements

The City developed a Phosphorus Control Plans (PCPs) that is consistent with the guidance provided by the State and requirements outlined under the Permit and the Lake Champlain TMDLs.

This plan was designed to achieve a level of phosphorus reduction equivalent to the percent reduction targets for developed lands in the Main Lake and Mallets Bay Lake segments. The City will submit annual reports and BMP tracking table to demonstrate the development of the PCP. An update to the approved PCP was submitted March 26, 2024, *Appendix D* showing the City has exceeded its phosphorus reduction target in the Mallet's Bay lake segment based on projects/practices implemented. Continued work needs to be done in the Main Lake segment however the projects/practices outlined demonstrate the target can be met.

8.3: Municipal Road Requirements

The City partners with the Chittenden County Regional Planning Commission (CCRPC) who survey and reassess all hydrologically connected road segments using the Road Erosion Inventory (REI) Survey 123 Assessment app once during a permit cycle. In addition, annually the CCRPC assists the City in updating the Implementation Table based on work completed.

Implementation Table (Portal)
https://anrweb.vt.gov/DEC/IWIS/MRGPReportViewer.aspx?ViewParms=True&Report=Portal

Reporter Application

https://vtanr.maps.arcgis.com/apps/instant/interactivelegend/index.html?appid=0c5ebf5a1fbb4d959cd2e6274bd50278

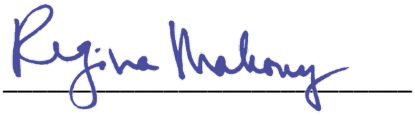
The City will continue to apply for grant opportunities to help with cost share of the outlet stabilization projects. Generally, the City has been able to stabilize 3 outlets per permit cycle.

Part 9: MONITORING, RECORD KEEPING, AND REPORTING

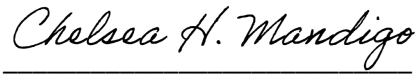
The City will comply with all monitoring, record keeping, and reporting requirements as outlined in Part 9 of the 2023 MS4 permit including internal review of the SWMP. This includes conducting an annual review of the SWMP as part of the annual reporting requirements due April 1st of each year of the permit.

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."



Regina Mahony, City Manager



Chelsea H. Mandigo, Water Quality Superintendent

Appendices Table

Appendix A: Updated Indian Brook Flow Restoration Plan and Approved Sunderland Brook Flow Restoration Plan

Appendix B: Map of the Watersheds in the City

Appendix C: Land Development Code Table of Contents

Link to entire document: https://www.essexjunction.org/codes/development-code/

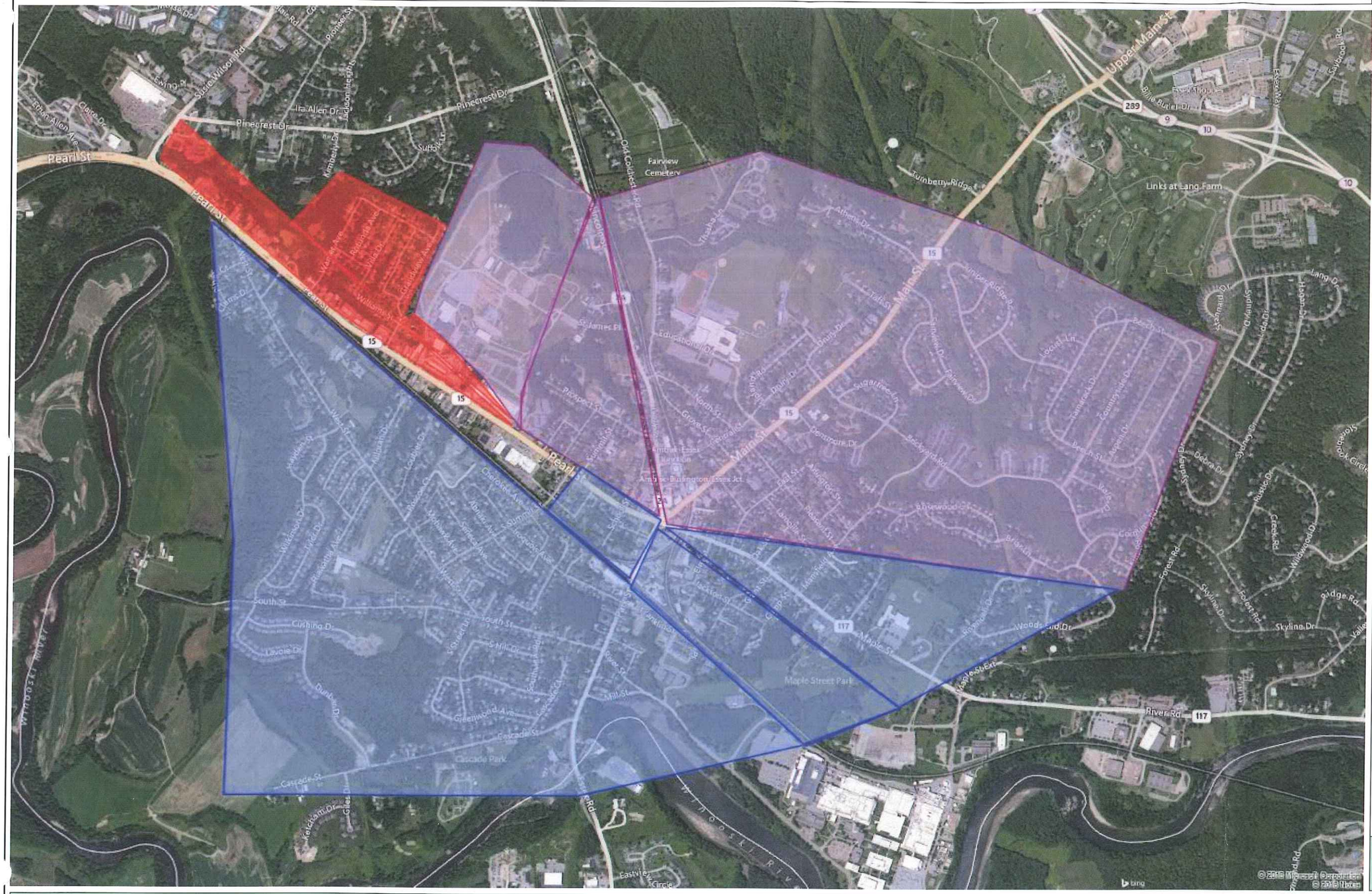
Appendix D: Phosphorus Control Plan

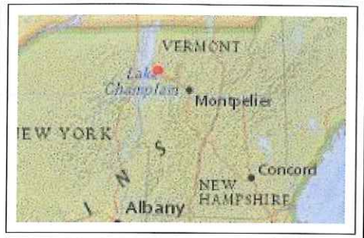
VERMONT

Village of Essex Junction Watersheds

Vermont Agency of Natural Resources

vermont.gov





LEGEND

Town Boundary

Red=Sunderland
Purple=Indian
Blue=Winooski

1: 15,644

1in = 1304 ft.
1cm = 156 meters

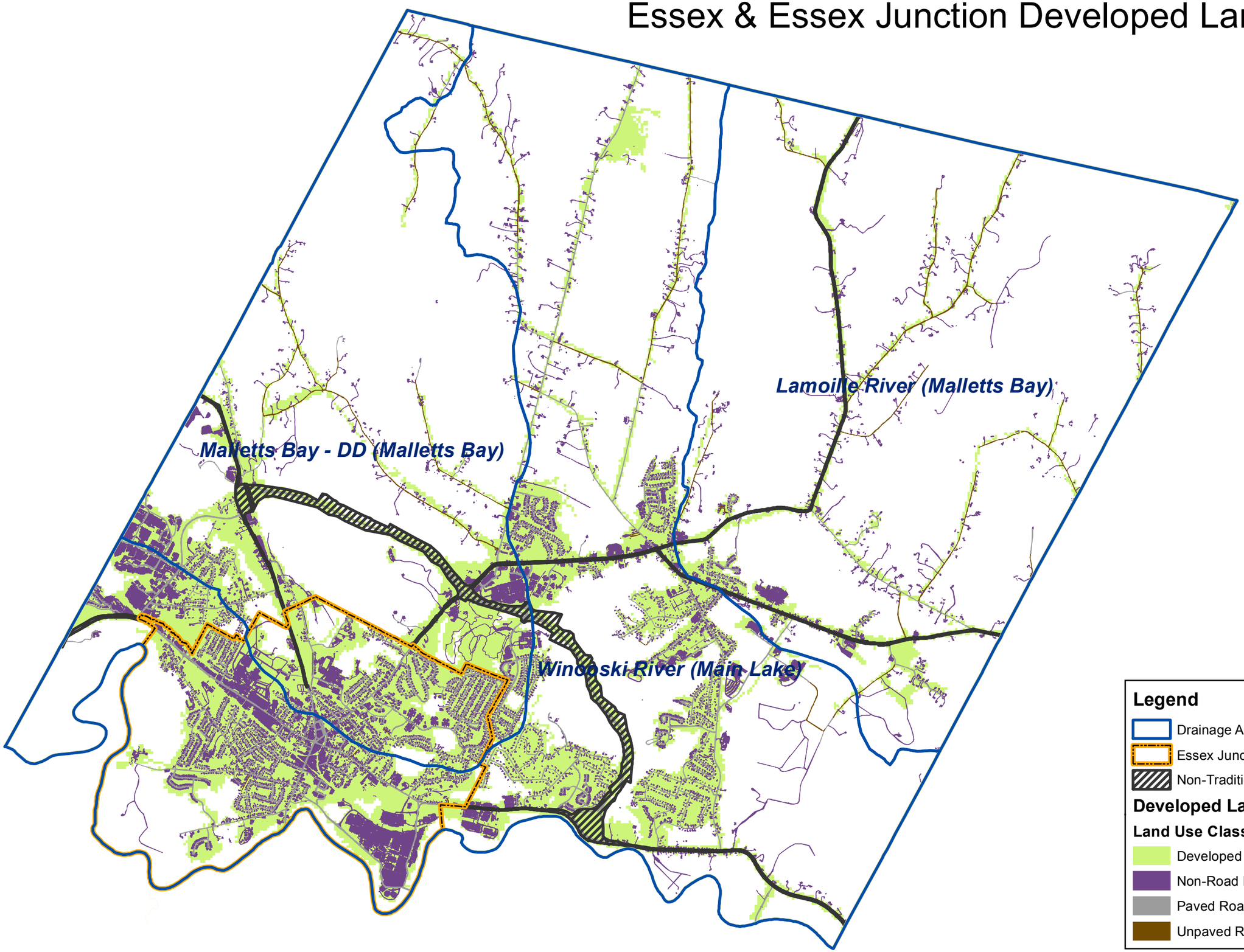
795.0 0 398.00 795.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

NOTES

RED= Sunderland Brook
PURPLE= Indian Brook
BLUE= Winooski RIver

Essex & Essex Junction Developed Land Areas



Created 9/18/2017 by VTDEC