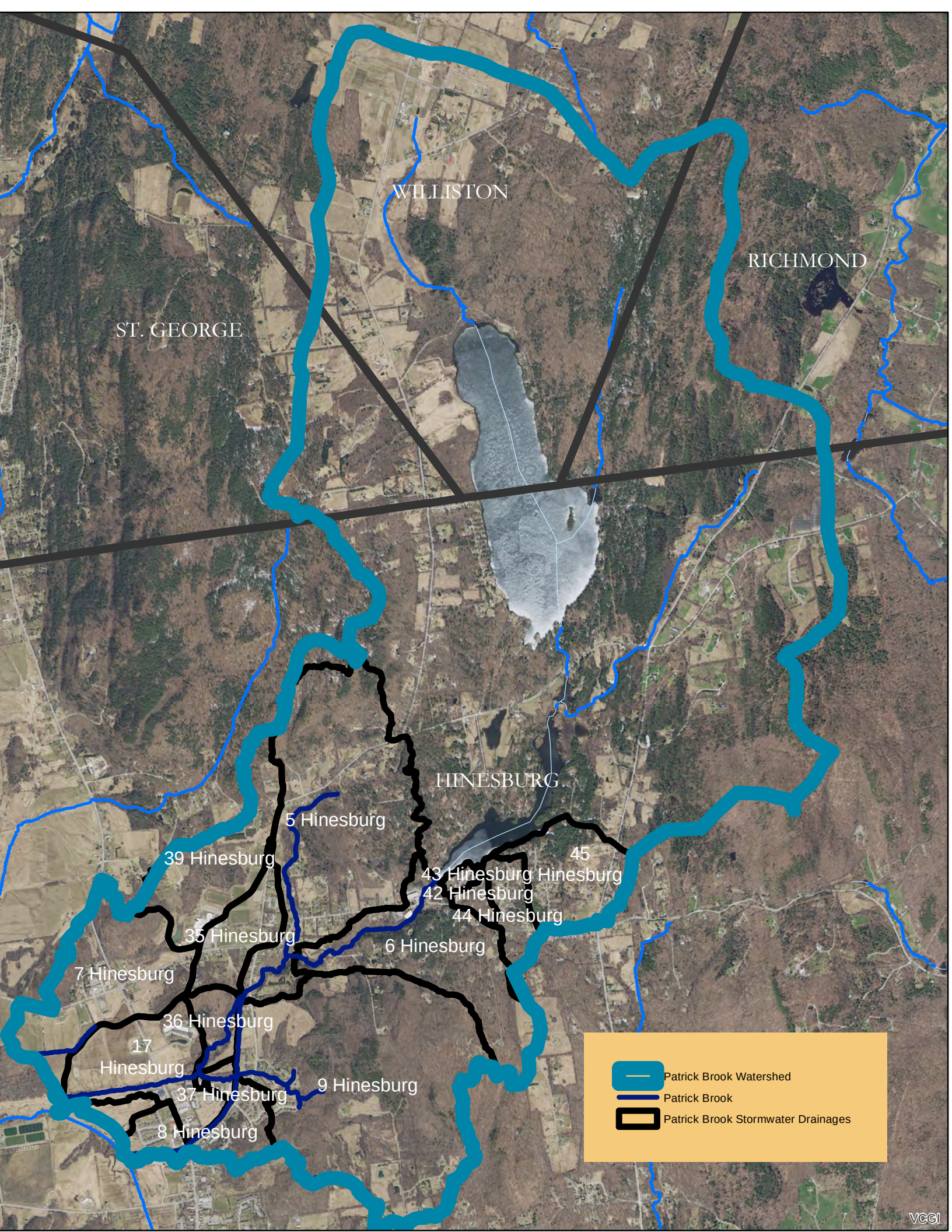
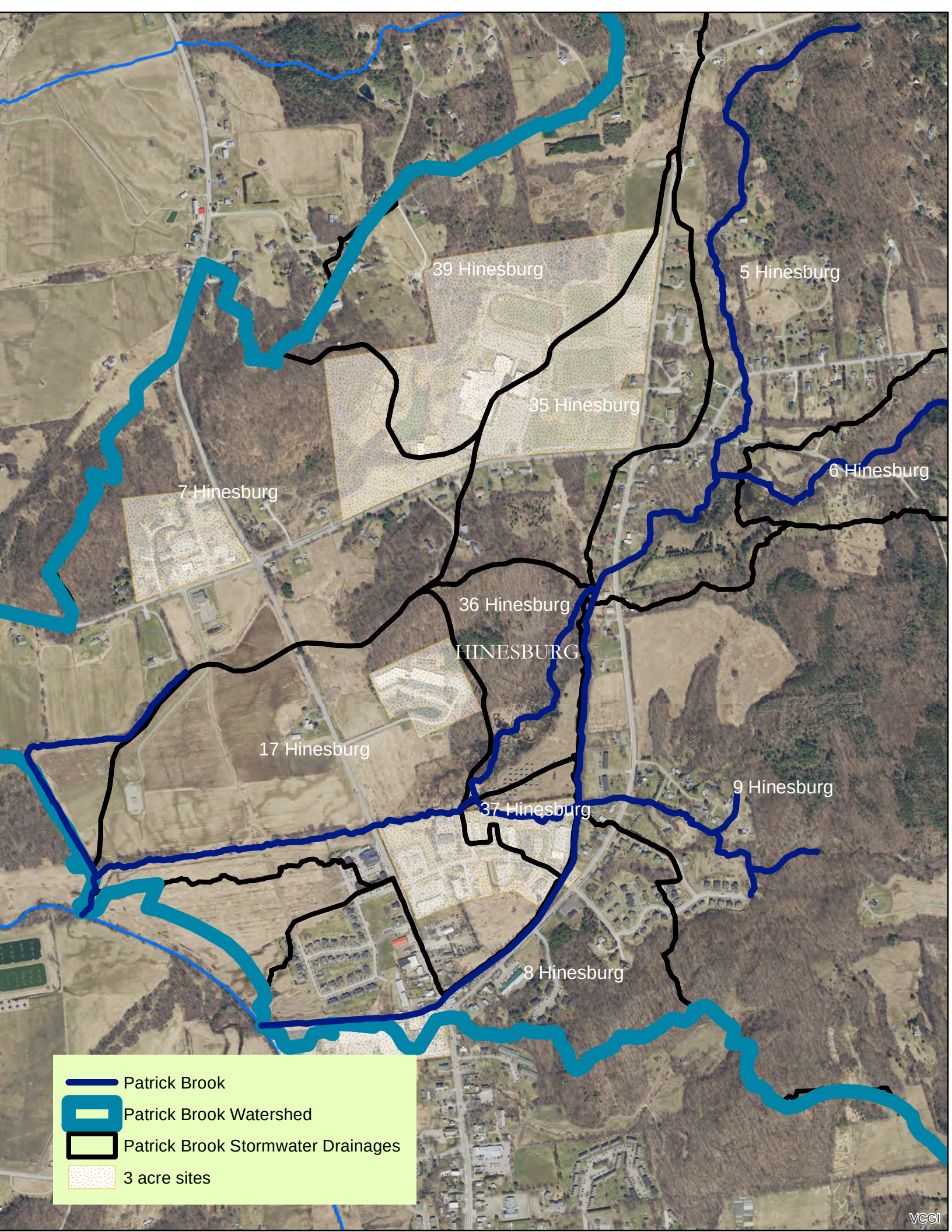
Patrick Brook
Hinesburg, Vermont

The lower reach of Patrick Brook in Hinesburg, Vermont has been found to be stressed by stormwater water as measured by the biological community of the brook. There are at least 14 discharges to the stream from the developed lands of Hinesburg from Sunset Lake down to the mouth at the LaPlatte River. The largest discharge to the river is drainage #9 Hinesburg which drains a large section of the southern part of the watershed. In addition under General Permit 3-9050 4 parcels in the lower watershed will have to implement or improve their existing stormwater discharges by 2028. It is estimated that if the suggested retrofits were installed and the 4 parcels achieve compliance the net reduction for all stormwater controls would be about 40% of the sediment load and 30% of the phosphorus load to the brook.

The recommended course of action is to install a stormwater treatment structure on many of these discharges that controls the water quality volume and the channel protection volume. Maps showing the location of these discharges and other possible retrofit locations on private or public land is provided. The brook is shown with two outfalls, one being the Hinesburg Canal which is no longer the main course of the brook during runoff events.

Addressing the large discharges of stormwater to the river will reduce contamination, and stream channel erosion, and will help prevent the stream from becoming declared stormwater impaired on the state of Vermont's 303d list of impaired waters. It will also reduce phosphorus currently being discharged to the LaPlatte River, Shelburne Bay and Lake Champlain.


WILLISTON
RICHMOND
ST. GEORGE
HINESBURG
5 Hinesburg
39 Hinesburg
45
43 Hinesburg
Hinesburg
42 Hinesburg
44 Hinesburg
35 Hinesburg
6 Hinesburg
7 Hinesburg
36 Hinesburg
17
Hinesburg
9 Hinesburg
37 Hinesburg
8 Hinesburg
Patrick Brook Watershed
Patrick Brook
Patrick Brook Stormwater Drainages
VCGI


39 Hinesburg
5 Hinesburg
35 Hinesburg
6 Hinesburg
7 Hinesburg
36 Hinesburg
HINESBURG
17 Hinesburg
9 Hinesburg
37 Hinesburg
8 Hinesburg
Patrick Brook
Patrick Brook Watershed
Patrick Brook Stormwater Drainages
3 acre sites
VCGI

Macroinvertebrate Site Summary

Location:	Patrick Brook	**Location ID:**	502198
Town:	Hinesburg	**Bio Site ID:**	520900000008
Description:	Sampled 100m above old dam off Commerce Rd.	**WBID:**	VT05-11
Stream Type:	Warm Water Medium Gradient		

Date	Density	Richness	EPT Richness	PMA-O	B.I.	Oligo.	EPT/EPT + Chiro	PPCS-F	Community Assessment
8/27/2004	1626	36.0	9.0	61.8	4.98	1.85	0.74	0.58	F-Poor
Full Support	≥ 300	≥ 30	≥ 16	≥ 45	≤ 5.4	≤ 12	≥ 0.45	≥ 0.4	
Indeterminate	≥ 250	≥ 28	≥ 15	≥ 40	≤ 5.65	≤ 14.5	≥ 0.43	≥ 0.35	
Non-Support	< 250	< 28	< 15	< 40	> 5.65	> 14.5	< 0.43	< 0.35	

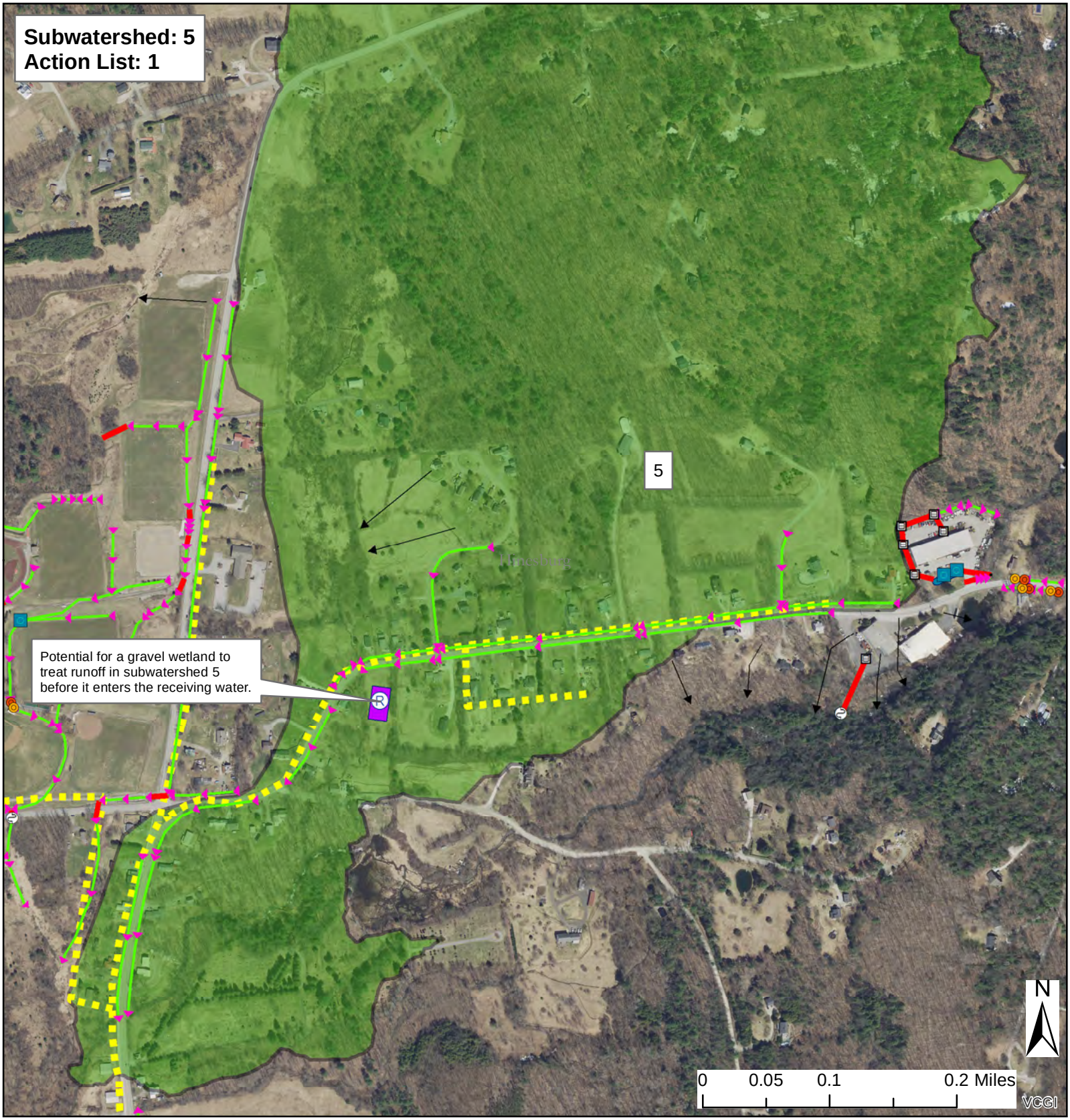
*Scoring Guidelines for Stream Type WWMG and WQ Class B(2).

Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Sediment Load with Current Reductions (lbs.)	Priority Action Sediment Reduction Credit	Sediment Load with Priority Action (lbs.)	Projected Phosphorus Load (lbs.)	Phosphorus Load with Current Reductions (lbs.)	Priority Action Phosphorus Reduction Credit	Phosphorus Load with Priority Action (lbs.)	Water Quality Volume (ft^3)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Phosphorus Removal Per Pound (based on annual phosphorus load)	Assistance Program	Raingarden Cost
5 Hinesburg	1	Gravel wetland for Richmond Rd near 200 Richmond Rd	GW/GS/OF/STR	5239-INDS	361.7	23402	40%	14041	81.3	73.1	20%	58.5	72095.0	$544,306		$58	$23,923	ERP,SRF, LCBP	$0
6 Hinesburg			CB/GS/OF/WP	3862-9015	190.6	12877	0%	12877	44.7	40.2	0%	40.2	39669.0					ERP,SRF, LCBP	$0
7 Hinesburg	4		WP/CB/GS/OF	3496-9010, 6957-9015	174.4	11962	40%	7177	36.9	35.1	30%	24.6	32758.1					ERP,SRF, LCBP	$0
8 Hinesburg	1	Gravel wetland for Mechanicsville Rd on Town Land at 90 Mechanicsville Rd	GW/PP/GS/OF/CB/CR/EDP	4376-9050, 4376-9015.1, 3783-9010.R1, 3583-9050, 3690-9050	70.7	5011	20%	4009	34.8	26.1	20%	20.9	30873.9	$233,093		$233	$16,746	ERP,SRF, LCBP	$0
9 Hinesburg	1	Extended Detention basin at bottom or cemetery	EDPMP/GS/OF/PP	4376-9050	458.3	27599	80%	5520	85.2	80.9	60%	32.4	75575.8	$529,031		$24	$10,017	ERP,SRF, LCBP	$0
17 Hinesburg	4		PP/GS/OF/CB/WP	4376-9015, 4304-9015, 3034-9015	125.1	7987	40%	4792	37.0	29.6	30%	20.7	32807.1					ERP,SRF, LCBP	$0
35 Hinesburg	4		OF/GS	5239-INDS	63.7	6902	40%	4141	24.0	21.6	30%	15.1	21264.1					ERP,SRF, LCBP	$0
36 Hinesburg			OF/GS		32.0	2118	0%	2118	5.9	5.9	0%	5.9	5220.5					ERP,SRF, LCBP	$0
37 Hinesburg	4		OF/GS	3034-9010	10.6	1908	40%	1145	5.9	5.6	30%	3.9	5223.7					ERP,SRF, LCBP	$0
39 Hinesburg	4		CB/GS/OF/WP	3393-9015	125.3	7908	40%	4745	31.4	26.7	30%	18.7	27842.7					ERP,SRF, LCBP	$0
42 Hinesburg			OF/CB		12.3	2631	0%	2631	7.3	7.3	0%	7.3	6484.1					ERP,SRF, LCBP	$77,264
43 Hinesburg	2	Infiltration basin off Jourdan St	IB/OF		7.4	2615	60%	1046	7.3	7.3	60%	2.9	6443.7	$67,659		$43	$15,527	ERP,SRF, LCBP	$56,899
44 Hinesburg	1	Infiltration basin on Town Land on Birchwood Dr.	IB/GS/OF		40.3	5050	40%	3030	14.0	14.0	20%	11.2	12446.3	$130,686		$65	$46,580	ERP,SRF, LCBP	$137,416
45 Hinesburg			GS/OF		96.9	10699	0%	10699	29.7	29.7	0%	29.7	26368.7					ERP,SRF, LCBP	$272,152

Target Maps

Showing Priority Action List Drainage Areas

And Potential Retrofit Locations

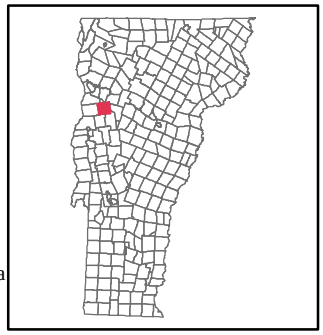


Hinesburg, VT

DEC Stormwater Infrastructure Mapping Project

This map shows high priority subwatersheds which are ranked by connectedness, percent of impervious cover, field observations, and potential retrofit measures and locations.

The data shown on this map is only as accurate as the available sources and field observations allowed and should be used as a basic planning level tool only.



Stormwater points

- Pipe Cross (not connected)
- Catchbasin
- Dry Well
- Drop Inlet
- Grate/Curb Inlet
- Yard drain
- CB tied to sanitary sewer
- Junction Box
- Stormwater Manhole
- Outfall
- Culvert inlet
- Culvert outlet
- Control Structure
- Treatment feature (see notes)
- Retrofit
- Unknown Point
- Information Point

Stormwater line

- Storm line
- Storm line (old Sanitary line)
- Tunnel (storm)
- Combined sewer
- Sanitary line
- Swale
- Footing drain
- Under drain
- Roof drain
- Infiltration pipe
- French drain
- Trench drain
- Emergency spillway
- Stream
- Overland flow

NRCS - Soils

- A
- B
- C
- D

SubwatershedID

- Priority Subwatershed
- Stormwater Treatment Area
- Potential Stormwater Treatment Area

Creator: Jim Pease, David Ainley
DEC - WID - Clean Water Initiative Program
Plotted Date: 9/20/2021
Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database, NRCS soils survery
Imagery Source: VCGI Best Available Imagery

VERMONT

Subwatershed: 8
Action List: 1

Potential for a gravel wetland to treat runoff in subwatershed 8 before it enters the receiving water.

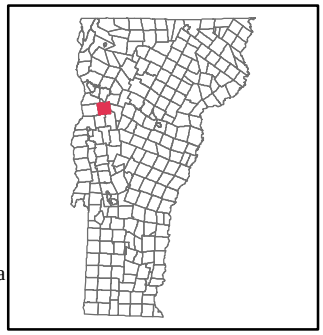
RIGGS RD
A/D
HAWK LN
not rated
B/D
MULBERRY LN
B
KAILEY'S WAY
COMMERCE ST
C/D
LILAC LN
THISTLE HILL DR
VILLAGE HEIGHTS RD
116
Hinesburg
FREDRIC WAY
C
MECHANICSVILLE RD
FARMALL DR
D
KELLEY'S FIELD RD
STELLA RD
LYMAN MDW
CHARLOTTE RD
N
0 0.045 0.09 0.18 Miles

Hinesburg, VT

DEC Stormwater Infrastructure Mapping Project

This map shows high priority subwatersheds which are ranked by connectedness, percent of impervious cover, field observations, and potential retrofit measures and locations.

The data shown on this map is only as accurate as the available sources and field observations allowed and should be used as a basic planning level tool only.



Stormwater points
- Pipe Cross (not connected)
- Catchbasin
- Dry Well
- Drop Inlet
- Grate/Curb Inlet
- Yard drain
- CB tied to sanitary sewer
- Junction Box
- Stormwater Manhole
- Outfall
- Culvert inlet
- Culvert outlet
- Control Structure
- Treatment feature (see notes)
- Retrofit
- Unknown Point
- Information Point

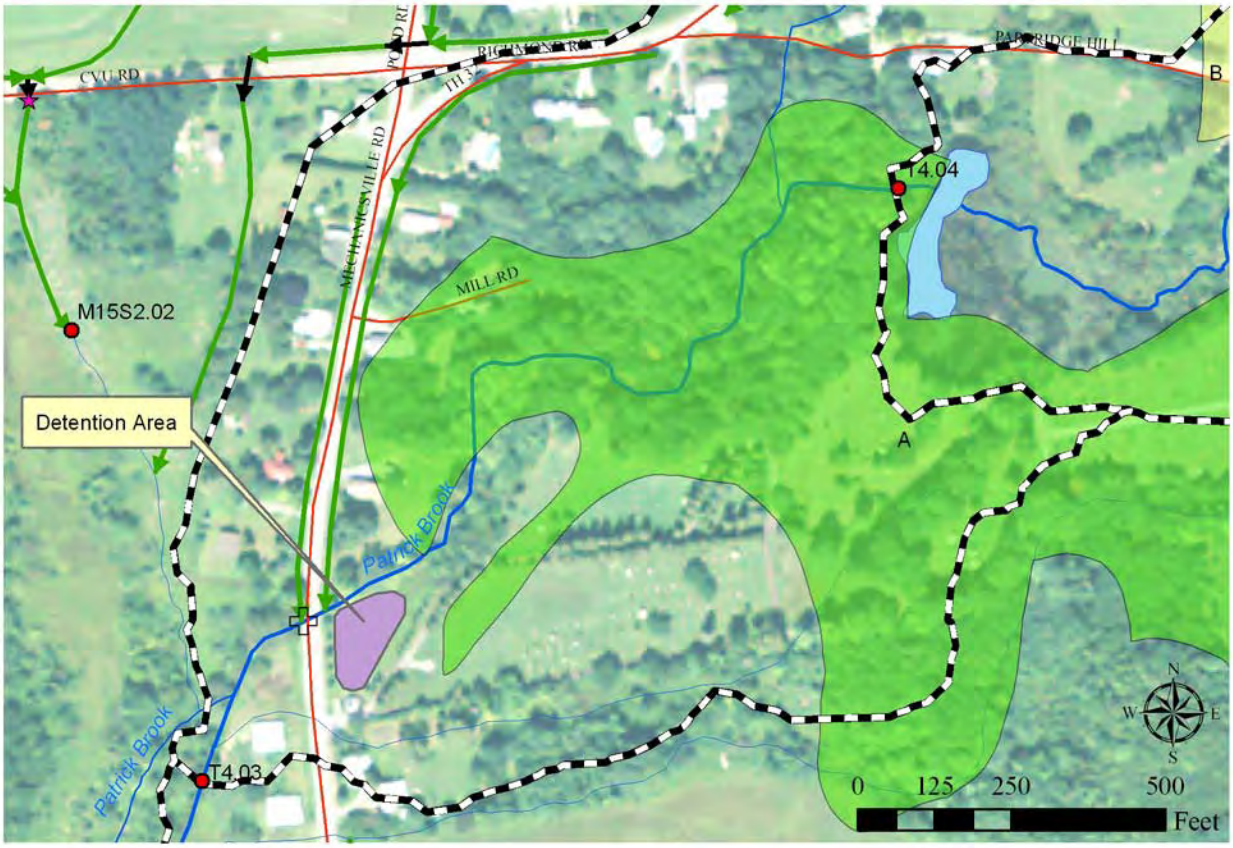
Stormwater line
- Storm line
- Storm line (old Sanitary line)
- Tunnel (storm)
- Combined sewer
- Sanitary line
- Swale
- Footing drain
- Under drain
- Roof drain
- Infiltration pipe
- French drain
- Trench drain
- Emergency spillway
- Stream
- Overland flow

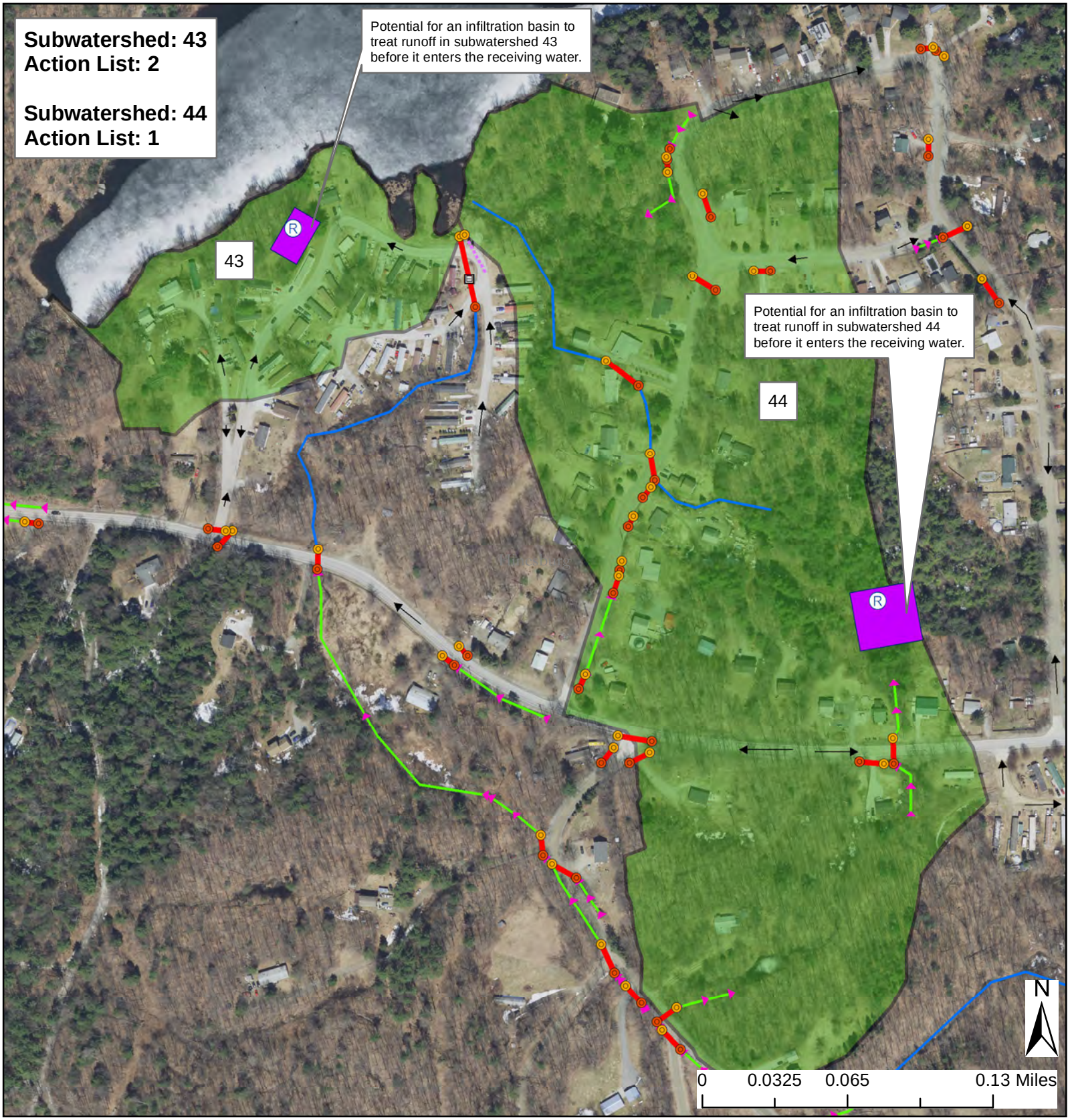
NRCS - Soils
- A
- B
- C
- D

SubwatershedID
- Priority Subwatershed
- Stormwater Treatment Area
- Potential Stormwater Treatment Area

Creator: Jim Pease, David Ainley
DEC - WID - Clean Water Initiative Program
Plotted Date: 9/20/2021
Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database, NRCS soils survery
Imagery Source: VCGI Best Available Imagery

Subwatershed: 9 Action List: 1
Project Location: Hinesburg Cemetery
Recommendations: Patrick Brook Stormwater
Overflow Property Owner: Town of Hinesburg
Parcel ID: 17-22-60.00
Reach ID: T4.03 & Upstream Reaches
Subwatershed Runoff Ranking: 0.405
Approximate Drainage Area to Outlet (acres): 4036.67
Approximate Impervious Area to Outlet (acres): 166.68
Subwatershed Runoff Depth (inches): 0.62



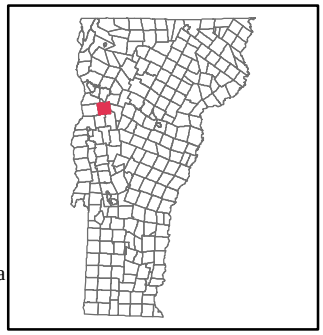


Hinesburg, VT

DEC Stormwater Infrastructure Mapping Project

This map shows high priority subwatersheds which are ranked by connectedness, percent of impervious cover, field observations, and potential retrofit measures and locations.

The data shown on this map is only as accurate as the available sources and field observations allowed and should be used as a basic planning level tool only.



Stormwater points

- Pipe Cross (not connected)
- Catchbasin
- Dry Well
- Drop Inlet
- Grate/Curb Inlet
- Yard drain
- CB tied to sanitary sewer
- Junction Box
- Stormwater Manhole
- Outfall
- Culvert inlet
- Culvert outlet
- Control Structure
- Treatment feature (see notes)
- Retrofit
- Unknown Point
- Information Point

Stormwater line

- Storm line
- Storm line (old Sanitary line)
- Tunnel (storm)
- Combined sewer
- Sanitary line
- Swale
- Footing drain
- Under drain
- Roof drain
- Infiltration pipe
- French drain
- Trench drain
- Emergency spillway
- Stream
- Overland flow

NRCS - Soils

- A
- B
- C
- D

SubwatershedID

- Priority Subwatershed
- Stormwater Treatment Area
- Potential Stormwater Treatment Area

Creator: Jim Pease, David Ainley
DEC - WID - Clean Water Initiative Program
Plotted Date: 9/20/2021
Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database, NRCS soils survery
Imagery Source: VCGI Best Available Imagery