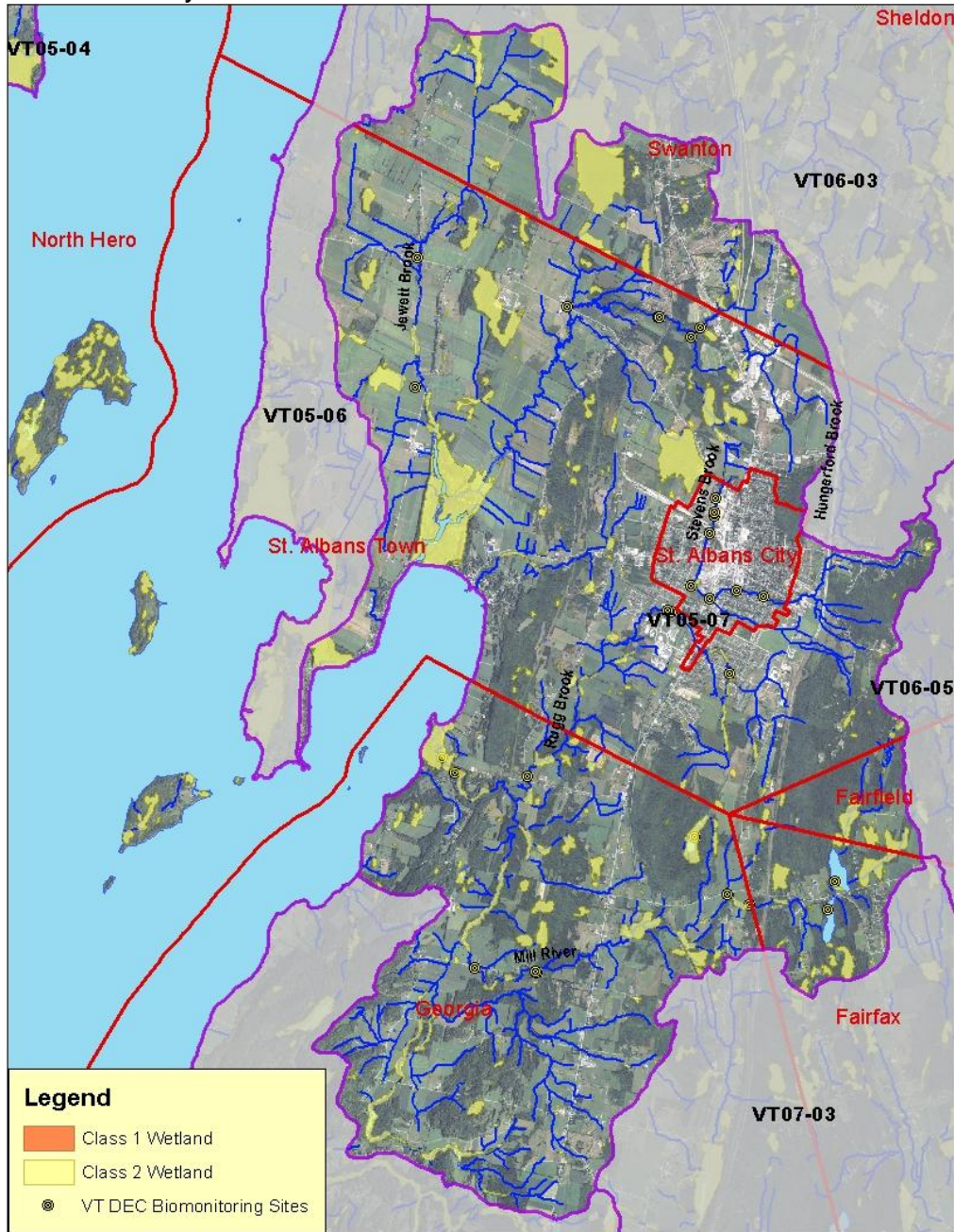


Basin 5

St. Albans Bay Streams

Update June 2013

An assessment of the St. Albans Bay streams was last summarized in December 2003 in a Basin 5 Upper Lake Champlain Direct Drainage Assessment Report. A plan for this basin was published in February 2009 and that plan included some updated river and stream, lake and pond water quality information. This document constitutes the update for St. Albans Bay streams.



St. Albans Bay Lake and Stream Segments with Impacts Summary

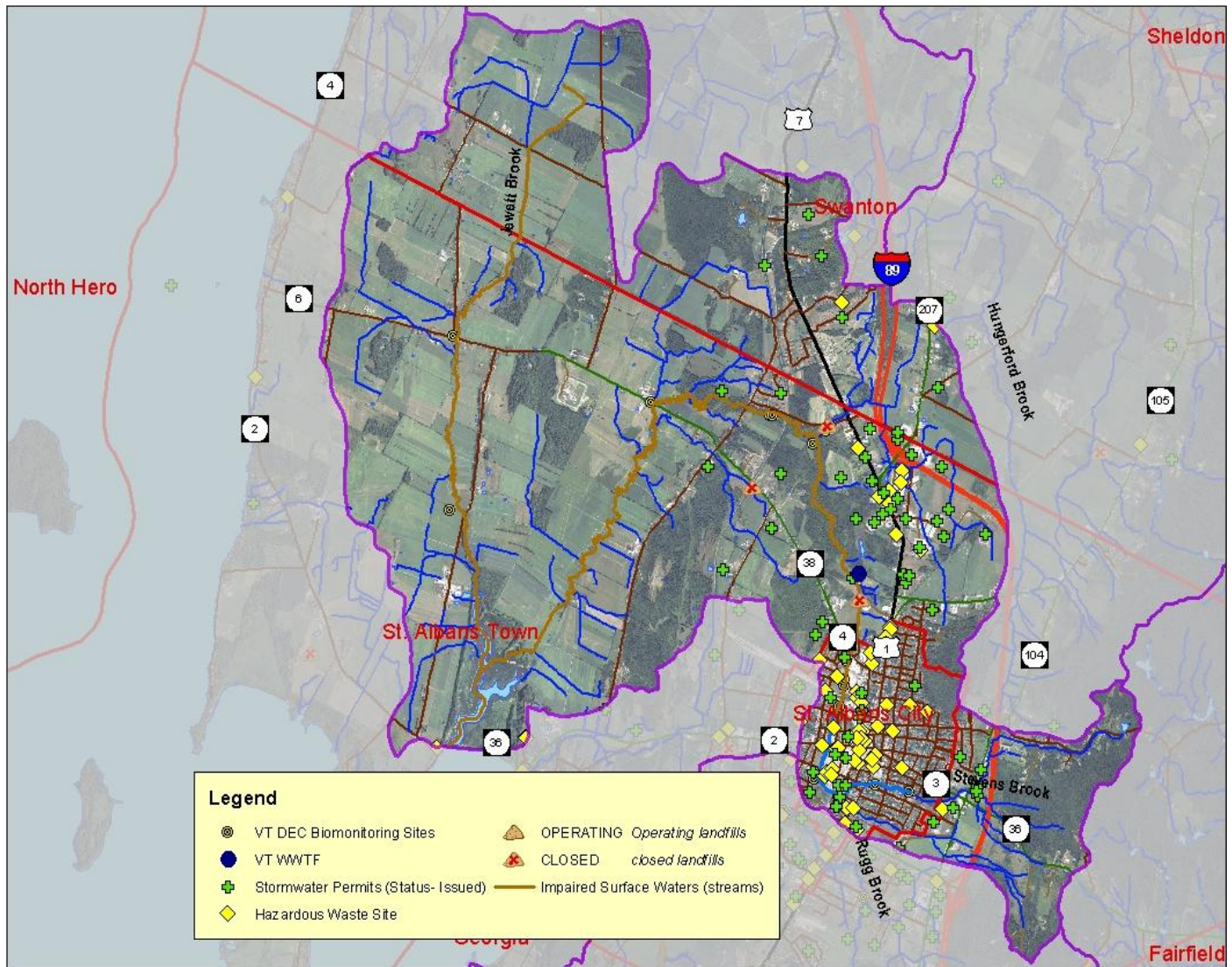
Table 1. Status of Rivers, Streams, Lakes, Ponds in St. Albans Bay Subwatershed

Stream or lake segment	Milage & Status	Pollutant	Source	Other Info.
Rugg Brook from mouth upstream	3.1 miles Impaired - Part A list	Nutrients, sediment, E. coli	From agricultural runoff	Part of an agricultural TMDL being developed
Jewett Brook	3.5 miles Impaired - Part A list	Nutrients, sediment, E. coli	Agricultural runoff	Part of an agricultural TMDL being developed
Mill River from mouth upstream	1.8 miles Impaired - Part A list	Nutrients, sediment	Agricultural runoff, streambank erosion	Part of an agricultural TMDL being developed
Stevens Brook from mouth upstream	6.8 miles Impaired - Part A list	Nutrients, sediment, E. coli	Agricultural runoff, stream instability	Lower part of Stevens Brook is through ag land but also receives all upstream urban pollutants & flow
Stevens Brook from CV Rail Yard down a mile	1.0 miles Impaired - Part A list	Petroleum products (oil, VOCs), sediment	Rail yard area is a hazardous waste site	There is a cluster of hazardous waste sites on Stevens Brook besides the rail yard
St. Albans Bay – Lake Champlain	Impaired - Part A list	PCBs		Elevated levels of PCBs in lake trout
Rugg Brook, from rm 3.1 upstream to Route 7	1.6 miles Impaired Part D list	Stormwater	Urban runoff	EPA approved a TMDL 2/19/2009
Stevens Brook from Pearl St up to rm 9.3	2.5 miles Impaired Part D list	Stormwater	Urban runoff	EPA approved a TMDL 2/19/2009
St. Albans Bay – Lake Champlain	Impaired Part D list	Phosphorus	Ag & urban runoff	EPA approved a TMDL for L.C. then disapproved it, new one underway
St. Albans Bay – Lake Champlain	Impaired - Part D list	Mercury	Atmospheric deposition	Elevated mercury in walleye; EPA approved a TMDL on 12/20/2007
St. Albans Bay – Lake Champlain	Altered - Part E list	Eurasian water milfoil	Spread after imported	Has been some harvesting; weevils are present in L.C.

St. Albans Bay – Lake Champlain	Altered- Part E list	Zebra mussels	Spread after imported	Expanding rapidly.
Mill River upper reaches	3.5 miles Stressed Part C list	Sediment, nutrient/ org. enrichment, E. coli	Ag & urban runoff, stream- bank erosion	Pollutants and stressors not well defined
St. Albans Reservoir North	Stressed- Part C list	Unknown- copper?	Reservoir treated with copper sulfate	Copper in sediments above NOAA threshold effects level
Rugg Brook	Stressed	Flow changes, physical channel changes,	Land development, suburban runoff	

Stevens Brook, St. Albans

The headwaters of Stevens Brook originate along the ridgeline east of Interstate 89. West of the interstate, Stevens Brook jogs southerly and then flows first west through the southern part of St. Albans City. It turns north after the floodwater diversion structure that was built in the late 1970s and shunts floodwaters from Stevens Brook into Rugg Brook at certain flows.



Stevens Brook then flows north along the western side of St. Albans City past the Central Vermont Railroad lands and facilities and then under Lower Newton Road and out of St. Albans City. Once out of the city, the brook continues north past the St. Albans WWTF and then through more rural and agricultural land than previously. Near Jewett Road, the Stevens Brook begins a westerly flow and then after approximately a mile, the stream turns south and continues in a southwesterly direction for approximately three miles until it reaches the large wetland complex at the confluence of Stevens and Jewett Brooks.

Assessment Information for Stevens Brook

Biological Monitoring

Table 2. Macroinvertebrate sampling results for Stevens Brook

	Rm 3.2	Rm 4.2	Rm 4.7	Rm 6.5	Rm 6.6	Rm 6.7	Rm 7.5	Rm 9.0
1998	---	poor	---	---	---	---	---	poor
2003	---	---	fair-poor	---	poor	---	---	---
2004	---	good-fair	fair	---	---	---	fair	---
2009	---	fair-poor	---	poor	---	---	---	---
2011	---	---	---	---	---	---	poor	---

Stevens Brook North Trib was sampled at rm 0.2 in 2008 and the macroinvertebrate community assessment was "fair".

Table 3. Fish community sampling results for Stevens Brook

	Rm 3.2	Rm 4.2	Rm 4.7	Rm 6.5	Rm 6.6	Rm 6.7	Rm 7.5	Rm 7.9
2003	---	---	poor	---	poor	---	---	---
2004	---	---	poor	---	---	---	poor	fair
2009	---	fair	---	poor	---	---	---	---
2011	---	poor	---	poor	---	---	poor	---

On the Stevens Brook North Trib at rm 0.2, it was assessed as "poor" also in 2008.

Table 4. Biological sampling sites on Stevens Brook St. Albans

Rivermile	Description
3.2	Located adjacent to Newton Road above first bridge west of Kellogg Rd
4.1	Located adjacent to Jewett Rd 100 meters below CC railroad bridge
4.2	Located adjacent to Jewett Rd 50 meters below CC railroad bridge
4.7	Located about ¼ mile above railroad crossing, above smal trib to the NE
6.5	Located above Newton Street bridge 10 meters
6.6	Located below Aldis Street bridge 20 meters
6.7	Located above Aldis Street bridge just below railroad crossing
6.8	Located below Pearl Street bridge
7.5	Located above Weldon Street bridge 100 meters
7.9	Immediately above culvert under Lemnah Street
9.0	Located below Lincoln Street bridge about 200 meters
9.3	Located immediately above Barlow Street bridge

Wastewater and Stormwater

Stormwater permits

As of May 2013, there were 37 operational stormwater permits with three of these as individual permits, 16 construction permits, and 1 MSGP permit with Stevens Brook or its tributaries as the receiving water.

Stevens Brook Combined Sewer Overflow (CSO)

The Lower Welden Street CSO was identified as a water quality problem in the 2003 Stevens and Rugg Brooks Watershed Report. It tested positive during an optical brightener test in 2007 done by the St. Albans Watershed Association. In November 2007, the City of St. Albans submitted a CSO Report to the Agency identifying this as the one active CSO in the city's collection system after a full study of their system. (The CSO is at the intersection of Lower Welden and South Elm Street at a manhole.)

A Combined Sewer Overflow Abatement Study was done by Forcier Aldrich & Associates in 2008 as part of meeting a 1272 order from ANR DEC WWMD, which called for an investigation of the contributing factors to the overflow and alternatives for elimination of the CSO with a deadline of June 30, 2009. St. Albans could not complete a report for ANR with the alternatives because the CSO did not overflow from September 2008 through April 2009 and they didn't have all the information they needed. The City asked for an extension.

From July 2009 through early June 2010, the CSO overflowed five times, however due to equipment malfunction, St. Albans wasn't able to collect extensive data and the city wanted more time. However due to the known discharge problems, ANR asked for actions to reduce the overflows.

In August 2010, the fourth amendment to the original 1272 order of 1992 (which called on the city to identify all combined sewer overflows with the sewage collection system and to assess options for eliminating or treating these overflows) was issued. This order called for completion of a remediation project that would eliminate roof drainage into the CSO by March 31 2011; a progress report on downtown projects by September 30 2011; monitoring results from CSO discharges by December 31 2011 among other conditions.

In November 2011, St. Albans notified the Agency that the roof drains from the Fonda Project had been disconnected from the sewer system. In December 2011, monitoring results showed the Welden Street CSO was still in violation of the CSO Policy. A meeting in February 2012, the Agency and St. Albans met about the "Downtown Streetscape" project and other means of eliminating stormwater from the Welden CSO and 1272 Order 3-1279-A5 was issued in April 2012 with new deadlines for projects and reporting on fixing this CSO problem.

Sewage Overflows and Incidents to Stevens Brook

There were thirteen documented overflow events from the St. Albans City WWTF system in the period January 1 2007 to June 28, 2013.

Stevens Brook Hazardous Waste Sites

New England Central Railroad Enginehouse Yard St. Albans

Remediation is underway at the New England Central Railroad hazardous waste site (an oil seep from improperly managed, stored, transferred fuel oil) (#770126) in St. Albans City near Stevens Brook. Track pans were put in place to prevent current leaching to the brook. A pump and treat system was installed to deal with the contamination that occurred

over a number of years earlier and this groundwater remediation system operated from 1997 to 2005. The remedial system was to be removed in spring or summer 2011.

There is still contamination onsite but it is reportedly not leaving the site. No petroleum sheens in or along Stevens Brook were observed in 2010. The consultant for the New England Central Railroad prepares a report of activities at the site, which included four groundwater sampling events throughout 2010. There are five monitoring wells in and around the trackpan system: MW-1, MW-2, MW-3, Mw-4, and MW-7. No VOCs have been detected in monitoring wells 1,2,3,7. Four VOCs were detected in MW-4. In 4 of 4 sampling events, 1,2,4 – trimethylbenzene was found far exceeding the Vermont groundwater enforcement standard of 5.0 ug/liter (the range of the four samples was 111 to 164 ug/liter). 1,3,5-trimethylbenzene and M,P-xylene were also both detected in MW-4.

Three Oil-Water-Separators at the NECR St. Albans Enginehouse Yard discharge pre-treated wastewater to the City of St. Albans Municipal Wastewater Treatment Plant (WWTP). These discharges are regulated by Vermont Pretreatment Discharge Permit #3-1454, which is held by CVPI. There are two discharge points: S/N 001 consists of the effluent from two oil-water separators (OWSs). The effluent of the 1,000-gallon OWS of the Spill Collection System at the locomotive fueling platform (the trackpan system mentioned above) is one of the two. This OWS also receives water from the sump pump in the containment moat surrounding the 50,000-gallon diesel AST. The trackpan system, and the AST and its moat, is owned and operated by NECR. The effluent of the 200-gallon OWS of the Groundwater Remediation System (GRS, owned and operated by CVPI) is the second of the two OWSs that make up discharge point S/N 001. It had received groundwater from the collection trenches along the west and east sides of the tracks, from the recovery wells near Stevens Brook, and from the deep groundwater suppression system beneath the trackpan system (via a buried pipe from MH-3). S/N 002 consists of the flow from the 1,000-gallon OWS at the outlet of the Stone Box Culvert (owned and operated by CVPI). The Stone Box Culvert (SBC) carries stormwater from multiple connections from the Engine House, Turntable, Bunkhouse, and catch basins located in the yard. These stormwater discharges are not associated with CVPI remedial operations or previous rail operations on site. The pipe from S/N 002 leads to a manhole of the St. Albans sewer system located in the floor of Stevens Brook, upstream (west) of the track crossings and eventually flows to the St. Albans Municipal Wastewater Treatment Plant.

The total discharge to the St. Albans WWTF plant from the two discharge points described above is estimated at 3,818,880 gallons in 2010 under the Pretreatment Discharge Permit 3-1454: no wastewater from the 200-gallon GRS OWS; unknown gallons of wastewater from the 1000-gallon trackpan OWS; and the 3.8 million gallon plus from the SBC OWS. The pretreatment discharge permit expired in March 2011 and a letter from Vermont DEC indicated that it is not necessary to renew it due to the closure of the Groundwater Remediation System. It is not clear what this means in terms of monitoring the other components of the two discharges to the WWTF.

St. Albans Gas & Light Property

The former St. Albans Gas & Light Property (SMS#77-0197) at the corner of Lasalle and Maple Streets and bordering Stevens Brook was used for gas manufacturing from the

1870s until the 1950s and so decades of contamination occurred at this site. "Stormwater runoff from the property flows directly into Stevens Brook." Numerous environmental investigations have been conducted on the property including sampling of soils on the site at various depths, groundwater sampling, and surface water and stream sediment sampling.

The latest sampling occurred as a final expanded site inspection done for EPA Region I by Weston Solutions of Wilmington Massachusetts in November 2001. The report by Weston presenting the results of their investigation is dated 30 December 2002. Seven sediment samples were collected at six locations (1 duplicate) along Stevens Brook. Sites SD-06 and SD-07 were upstream reference samples. The Weston investigation found: "one VOC, acetone, was detected in the sediment samples collected from Stevens Brook at concentrations greater than or equal to three times the appropriate reference sample (SD-06) concentration or greater than or equal to the reference sample's SQL"; "eight SVOCs were detected in the sediment samples collected from Stevens Brook at concentrations greater than or equal to three times the appropriate reference sample (SD-06) concentration or greater than or equal to the reference sample's SQL"; "four inorganic analytes [cadmium, cyanide, barium, zinc] were detected in sediment samples collected from Stevens Brook at concentrations greater than or equal to three times the appropriate reference sample (SD-06 and SD-07) concentration or greater than or equal to the reference sample's SDL."

An e-mail in January 2013 from the Vermont ANR DEC Sites Management Section to EPA summarized recent activity at the site:

"Between 2005 and 2012, EPA Removals conducted a series of site evaluations which consisted of collecting surface and subsurface soil samples, groundwater samples soil gas around apartment buildings, and collecting indoor air samples in apartment buildings. Benzene, naphthalene and PAHs-benzo (a) pyrene were detected above regulatory levels. EPA conducted three soil removal actions involving excavation of contaminated soils from the site and replacing them with clean fill.

Based on the level of contamination in the subsurface in the form of coal tar, contaminated soils at depth, and likely highly contaminated soil vapor as well as likely contaminated stream sediments downstream from the site, we believe there remains a potential for direct contact threat and impacts to Steven's Brook. At this time we do not believe this site merits a 'low priority archive' decision. There are a number of residences in the site area that are constructed over coal tar related contamination but have never been assessed for potential for vapor intrusion issues. These could be significant. We would like to request that site remain in Cerclis. There is no viable potential responsible party."

EPA stated that this Site will not be archived at this time in a March 19, 2013 e-mail reply.

St. Albans Department of Public Works yard

The St. Albans DPW yard on Aldis Street is also a hazardous waste site (96-2036) adjacent to Stevens Brook. Groundwater and surface water sampling first occurred in 1997 with 3 sampling rounds that year and in 1998; two sampling rounds in 1999; quarterly

sampling in 2000 and 2001; one sampling event in 2002, 2003, 2004, 2006, and 2008. Three sites have been sampled on Stevens Brook. Groundwater modeling indicates that the MTBE and BTEX plumes are slowly migrating towards the Stevens Brook.

In the 2002 sampling, the midstream surface water sample had trace petroleum product contamination and the downstream and upstream samples had no detectable contamination. In the 2003 sampling, all three surface water sites had detectable petroleum contamination although the midstream sample had the highest concentration (23.2 ug/L MTBE, 25.3 ug/L toluene, 47.7 ug/L total xylenes among others). In 2004, all three stream samples had detectable petroleum contamination with the highest concentration observed at the midstream sample. In 2006, the downstream stream sample showed detectable petroleum contamination. In 2008, the three Stevens Brook samples had no detectable contamination. There is a stormwater outfall just below the midstream sampling site.

A number of groundwater monitoring wells were sampled at the site over the years described above although the number of wells declined over time due to damage and loss. The pattern of sample results have shown over the years that most of the contamination is in the area where the underground storage tanks were removed at monitoring wells 2, 3, and 4. Unfortunately, following the excavation of test pits in 2009 that revealed “substantial soil contamination” in five pits and “low level contamination” in another three pits, the site was “closed” and the monitoring wells filled in so that there is no information on the groundwater or surface water contaminant levels for the past five years.

S.B Collins

S.B Collins Bulk Facility on Lower Welden St has been monitored since 1995. Several of the groundwater monitoring wells have shown a number of compounds (xylenes, toluene, benzene, naphthalene..) well above the VGES. Stevens Brook is behind this site but not that close to the wells that have the high levels of toxic compounds. In 2009, well 95-MW-2 that is closest to Stevens Brook on this site was abandoned as of three that were “consistently free of contaminants”.

Assessment Status

Impaired Reaches

Stevens Brook: 6.8 - upstream from St. Albans Bay - aquatic biota/habitat, contact recreation and aesthetics impaired due to turbidity, organic and nutrient enrichment, algae and thermal changes from ag. impacts, eroding banks, plus all the upstream urban/industrial inputs.

Stevens Brook: 1.0 - below Central Vermont Railway - aquatic biota/habitat, aesthetics, contact recreation and secondary contact recreation, drinking water supply impaired due to organics, inorganics, metals from hazardous waste sites plus upstream urban inputs.

Stevens Brook: 2.5 - above Central Vermont Railway (above rm 6.8 - Pearl Street) - aquatic biota/habitat, aesthetics, contact recreation impaired due to stormwater runoff (including sedimentation and turbidity, organics and metals, trash), an uncorrected CSO (0.5 miles), and habitat alterations from urban runoff, contained and channelized stream, loss of riparian vegetation, land development, road construction and repair, and dredging.

The listing status is given in the table at the beginning of this updated assessment.

Information Sources

Agency of Natural Resources Department of Environmental Conservation 1272 Order Nol. 3-1279-A5 in the matter of City of St. Albans, St. Albans Vermont

2011 Biennial Groundwater Monitoring Reporting for S.B. Collins Bulk Facility, St. Albans, Vermont, SMS Site #95-1906, November 5, 2011. AEF Consulting, Johnson, Vermont.

Annual Progress Report #23 Enginehouse Yard New England Central Railroad, January 1, 2010 through December 31, 2010. Arcadis, February 28, 2011.

Final Expanded Site Inspection Report for St. Albans Gas & Light Property (former), St. Albans, Vermont, December 30, 2002. Prepared for U.S. Environmental Protection Agency Region I by Weston Solutions Superfund Technical Assessment and Response Team 2000, Wilmington, Massachusetts.

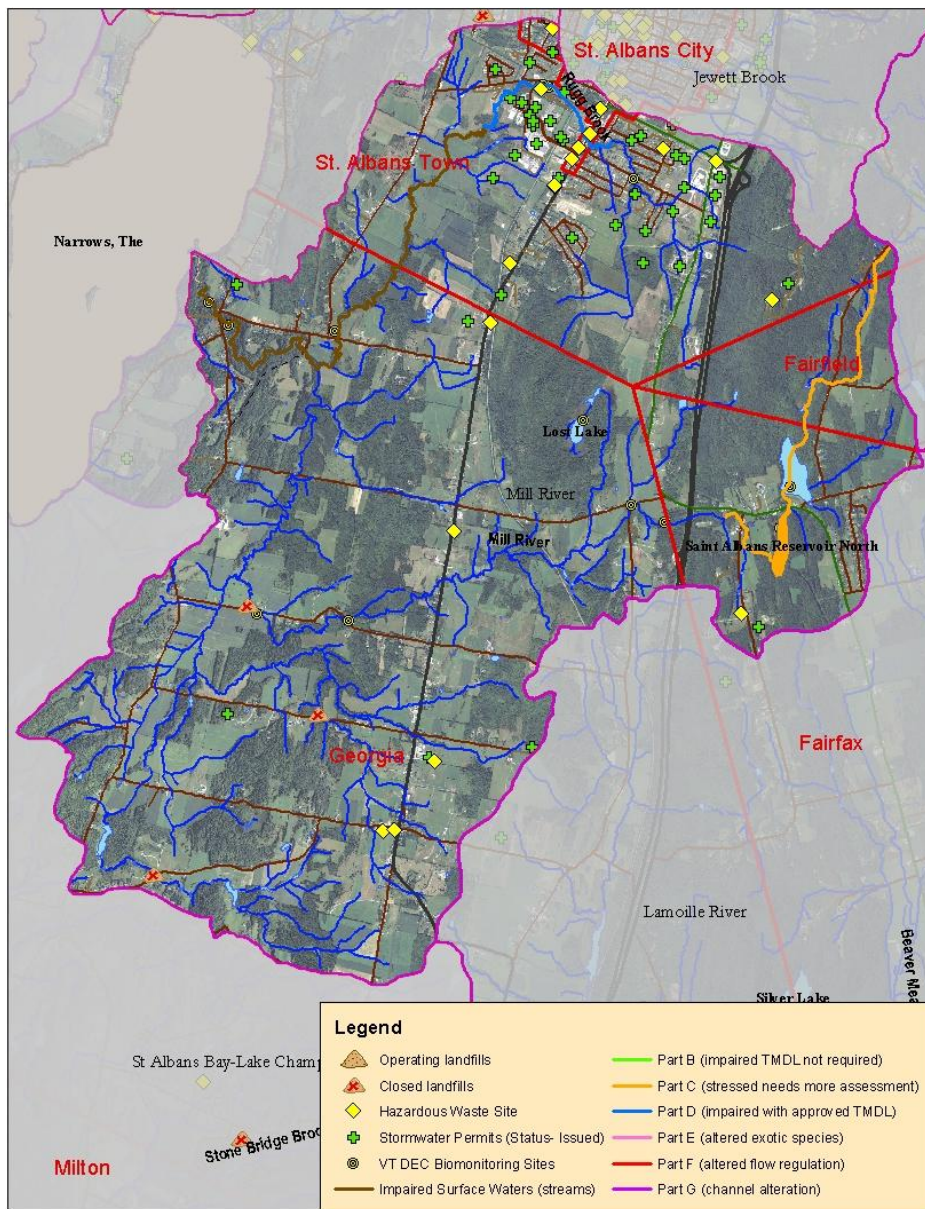
Biological and Aquatic Life Use Attainment Assessment of Stevens Brook, DRAFT-August 15, 2005. Vermont DEC WQD Biomonitoring and Aquatic Studies Section, Waterbury, Vermont.

Vermont ANR Department of Environmental Conservation Watershed Management Division Stormwater Program database. March 26, 2013.

Mill River and Rugg Brook

The Mill River originates at the St. Albans Reservoir and flows west under Interstate 89 then southwesterly passing under Route 7. About a mile and a half west of Route 7, the river flows abruptly north turning west again towards Lake Champlain after Rugg Brook enters. It flows through a lakeside floodplain forest community west of Georgia Shore Road before entering St. Albans Bay of Lake Champlain.

Rugg Brook's headwaters originate from east of Interstate 89 and from the south between St. Albans Hill and Bellevue Hill. The two main branches of this brook flow together near Clyde Allen Drive in St. Albans. The brook flows northwest through suburban and urban areas then west along Nason Street in St. Albans City. It then flows southwest through primarily agricultural land until it joins the Mill River.



Assessment Information for Mill River and Rugg Brook

Biological Monitoring Results

Mill River

Table 5. Macroinvertebrate community assessment of the Mill River 1998 to present

	Rm 0.7	Rm 5.1	Rm 8.7
1998	good	---	----
1999	fair	----	----
2002	fair	----	vgood-good
2004	good	----	----
2006	---	----	very good
2009	fair	vgood-good	----

The fish assemblage at rivermile 0.7 on Mill River clearly failed to meet Class B criteria in 1992 and 1998. In 2006 and 2009, the fish community assessment results were also “poor” at rm 0.7. Further upstream at rm 8.7 on the Mill River, the fish community was still not meeting expectations and standards with the community assessed as “poor” in 2002 and in 2006.

Table 6. Biological sampling site locations on Mill River

Rivermile	Description
0.2	Located 150 meters below Middle Road bridge below the first riffle.
0.7	Located 50 meters above Middle Road and the USGS gage station
4.3	Located below Hubbard Road at 2 nd road crossing west of Route 7
5.1	Sampled 20 meters upstream of culvert on Hubbard Road
5.3	Located above first bridge crossing west of Route 7
8.4	Located at culvert pool below Oakland State Road
8.7	Located below I-89 about 250 meters, below South St. Albans Reservoir about 1 mile

Rugg Brook

Table 7. Rugg Brook macroinvertebrate sampling results 1999 – present.

	Rm 0.5	Rm 4.3	Rm 4.4	Rm 5.3
1999	poor	----	----	----
2002	----	----	poor	----
2004	fair	----	fair	----
2009	vgood-good	poor	----	good-fair
2011	----	fair	----	good

In 1999, 2000, 2004, and 2009 at rivermile 4.3 on Rugg Brook, the fish community was assessed as “poor”. It improved but only to “fair” in 2011 at this same site.

Table 8. Biological sampling site locations on Rugg Brook

Rivermile	Description
0.5	in Georgia located upstream of Mill River Road in a riffle at about middle of pasture
4.3	located below double culvert on trailer park road off of Nason St
4.4	located below double culvert on trailer park road off of Nason St
5.3	along Fairfax Rd, upstream of cemetery

Stormwater Issues

Stormwater TMDLs were approved for Rugg and Stevens Brooks in February 2009.

Table 9. Stormwater permits with receiving water as Rugg Brook or tributaries

Operational (individual)	construction	MSGP
18 (7)	6	---

Assessment Status

Impaired Miles

Mill River: 1.8 - mouth upstream to Rugg Brook confluence - aquatic biota/habitat impaired due to nutrient enrichment and sedimentation from agricultural activities and some streambank erosion.

Rugg Brook: 3.1 - upstream from the mouth (at Mill River) - aquatic biota/habitat, aesthetics, and contact recreation impaired due to sedimentation, turbidity, nutrients, pathogens, and thermal modifications from loss of riparian vegetation, agricultural land runoff, cows with access to brook.

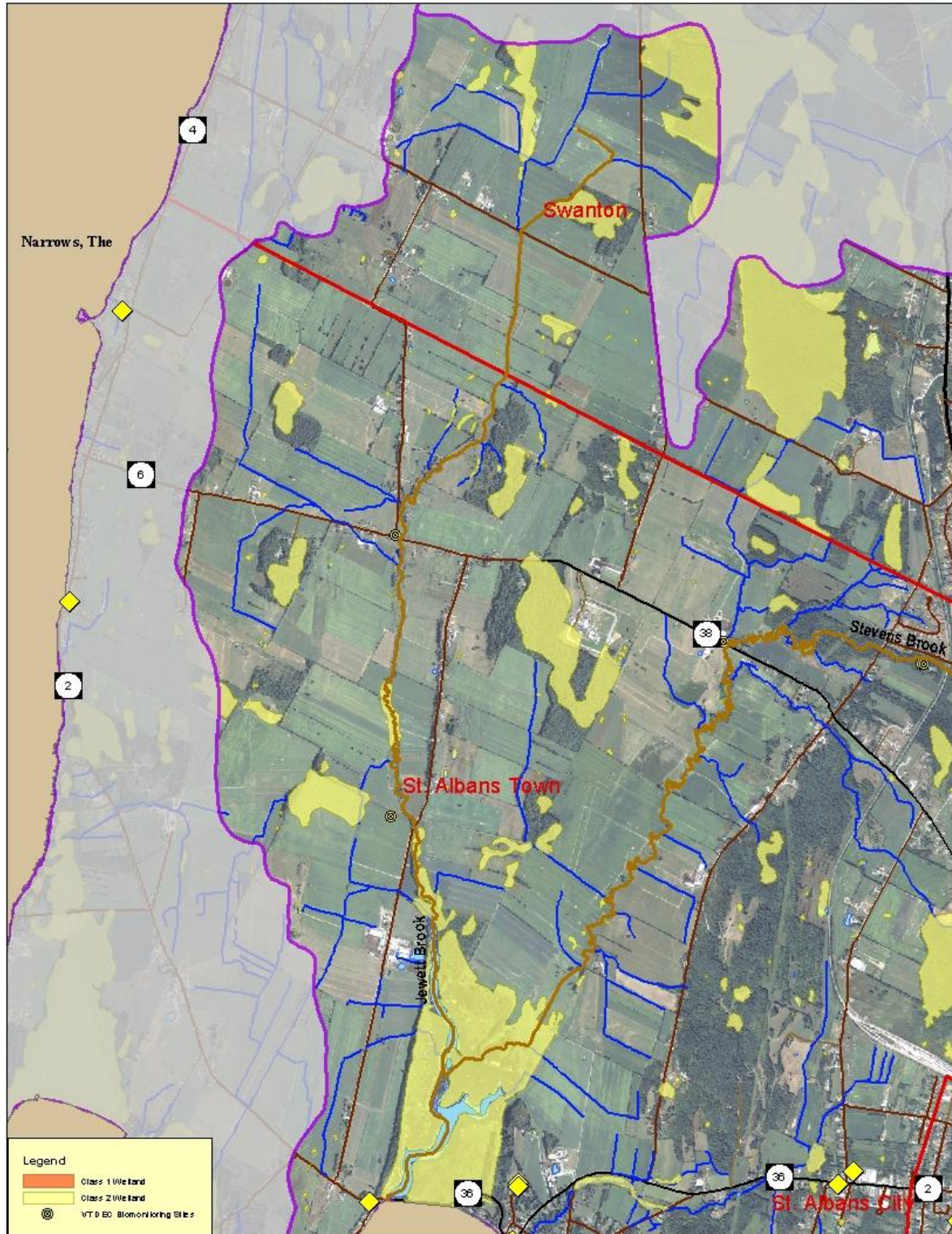
Rugg Brook: 1.6 - from rm 3.1 upstream to Route 7 - aquatic biota/habitat and aesthetics impaired due to stormwater from urban/suburban runoff, physical alterations of channel, loss of riparian vegetation, land development.

Stressed Miles

Mill River: 3.0 - upper 3 miles - aquatic biota/habitat stressed due to hydrological changes, sediments from erosion. C(1100,1500)

Rugg Brook: 1.1 - upstream from Route 7 (see above) - aquatic habitat stressed due to flow changes, physical habitat alterations from land development, suburban runoff.

Jewett Brook



Assessment Information

Biological monitoring results

Jewett Brook

In 1992, Jewett Brook was sampled at rivermile 3.2 and the macroinvertebrate community was “poor”. No more recent data is available

Assessment Status

Impaired Miles

Jewett Brook: 3.5 - upstream from mouth - aquatic biota/habitat and contact recreation (aesthetics stressed) due to nutrient and organic enrichment, turbidity, algae, and pathogens due to agricultural runoff, cow access to stream and loss of riparian vegetation.