



TOWN OF RICHMOND
RICHMOND TOWN CENTER
203 Bridge Street, P.O. Box 285
Richmond, Vermont 05477



January 16, 2019

Richmond Conservation Commission
c/o Judy Rosovsky, Chair
Via Email and paper copy

RE: Town of Richmond Conservation Reserve Fund Application: Volunteers' Green
Riverbank Stabilization

Dear Judy and Members of the Commission:

The Town of Richmond seeks Conservation Reserve Fund monies to aid in the stabilization of the riverbank of Volunteers' Green, from the Bridge Street Bridge to approximately 300 feet west (downstream from the bridge), hereafter the bandshell area. This request is in keeping with Conservation Fund policy to maintain recreation facilities, as this part of the park is threatened by erosion.

I look forward to meeting with you and if you have any questions I may be reached at 434-5170.

Josh Arneson, Town Manager

Volunteers' Green Background

The Town of Richmond has maintained the recreation area known as Volunteers' Green for many years. This is the town's primary active recreation facility and is home to youth soccer, baseball and other organized sports as well as a trail, open space, river access and the Town's only public playground. During winter-months, the park is used less formally but hiking, cross-country skiing and ice skating are popular. Dog-owners (and their dogs) are likely the most consistent users of Volunteers' Green, visiting in every season, every kind of weather and from dawn till well after dark.

Additionally, Volunteers' Green features restrooms and a bandstand area which is used by the Richmond Farmers Market from May to October, and for Richmond Community Band performances. Each year the town's July 4th celebration uses Volunteers' Green as a gathering place to watch fireworks

Volunteers' Green is approximately 18 acres in size, with over 2,000 feet of rivershore; due to floodplain and floodway restrictions, hardened or permanent facilities are restricted, and no new development is likely to occur to expand or improve upon the existing facilities.

Problem: Riverbank Erosion Threatens Volunteers' Green

One of the most attractive features of the park is its location beside the Winooski River. This picturesque river provides additional recreational opportunities and adds to the aesthetic value of the park. Unfortunately, the location beside the river means that the entirety of the park lies within the river's floodplain, with a significant portion within the floodway – an area that is exposed to swift flowing water during floods. The park is vulnerable to erosion damage, as evidenced during the Irene flooding in 2011. While that erosion damage was mostly limited to the playground area, the riverbank downstream of the Bridge Street bridge has suffered gradual erosion over the years from lesser floods (when the river overflows its banks) and from bank-full flows (when the river's flow is very high but stays within its banks), particularly when the river is carrying ice.

In response to repeated requests over several years (beginning in 2007) from citizens concerned by the slow but persistent erosion narrowing the treed buffer between the river and the Volunteers' Green fields, the Selectboard directed the Town Manager to investigate possible remedies with the Vermont Department of Environmental Conservation. A site visit was first conducted with the Richmond Town Planner and Chris Brunelle (River Engineer) and Gretchen Alexander (River Scientist) both with the Vermont Department of Environmental Conservation's River Corridor & Floodplain Protection Program (see attached "Meeting Notes - Erosion Control/Stream Alteration Site Visit – Richmond VT (6/18/2009) from Cathleen Gent, Richmond Town Planner").

DEC River Engineer Chris Brunelle's recommendation during this 2009 site visit "that approximately 100 feet of rip-rap should be replaced to protect the area along the

Volunteers' Green" and that "due to the public infrastructure investment, the replacement of the rip-rap is likely to be approved."

Between 2009 and early 2017 no action was taken on this subject, but erosion continued, and citizens continued to voice their concerns.

In 2017 the Selectboard took up the subject again and another site visit was arranged with Gretchen Alexander and Chris Brunelle. During that visit Mr. Brunelle described the erosion problem immediately downstream of the Bridge Street bridge as "classic contraction scour – basically scour associated with water passing through a narrow opening. The bridge has no wing walls, and it is common to see this type of scour in the absence of wing walls. Armoring the bank is essentially creating wing walls for the bridge" (see attached Email: RE: Richmond's Winooski bank stabilization quandary (5/25/2017) from Gretchen G. Alexander, River Scientist, River Corridor & Floodplain Protection Program). Mr. Brunelle stated that nothing short of bank armoring (rip rap or poured concrete) could withstand this scour immediately downstream of the bridge.

Project Description: Targeted Bank Stabilization

Based on DEC's assessment, the Selectboard elected in 2018 to take steps to slow the erosive force of the river. In September 2018 a contractor installed erosion fabric and type III and IV stone (very large) along the northern bank of the river beginning at the downstream edge of the Bridge Street bridge and running approximately 300-feet. The canoe access area immediately downstream was widened to improve access. .

New plantings will be placed at the top of the bank, and disturbed areas of the green will be restored. Heavy equipment was used to deliver and place the stone, after first removing all trees less than 12" in diameter to facilitate stone placement. New plantings will be placed at the top of the bank, and disturbed areas of the green will be restored.

Responses to Conservation Commission Questions

The following are responses to questions and concerns voiced by the Conservation Commission during its review of the first iteration of this proposal in 2018, and during discussions with the Selectboard:

What are the alternatives to rip rap? Can a bioengineering project achieve the desired goal?

Alternative 1. No Action. Volunteers' Green, as described in the 'background' section of this application is used extensively throughout the year by individuals, organizations and teams. Allowing the erosion to continue is not an option that the Selectboard is willing to consider.

There is no alternative 2. During an on-site visit by DEC River Engineer Chris Brunelle in spring 2017, he explained that because the riverbank immediately downstream of the bridge takes the full brunt of the rivers force during high water periods, the town's only

option that could maintain the bandshell area and the bridge footing is rip-rap or poured concrete. Green-armoring, including bioengineered efforts such as tying tree stumps and downed trees to the bank, planting willow fascines or installing revetments would not be strong enough to withstand the force of the river here.

What will the impacts to the immediate area (e.g. river bottom scouring) and downstream flow effects be?

Per the attached email titled "Email: RE: Richmond's Winooski bank stabilization quandary" sent on May 25, 2017 from DEC's Gretchen Alexander and Chris Brunelle "It really isn't possible to predict to what extent the erosion process will continue laterally and the rate is largely dependent on the frequency of high flow events. Whether and how to go about armoring this area is a question of risk management and balancing the tradeoffs of town landuse values, financial costs, and environmental impacts."

Has the rate of erosion been measured?

Over the past several years erosion immediately downstream of the Bridge Street bridge has exposed the piers/footing of the old bridge and has scoured the riverbank undercutting the trees lining the bank to the point that what is essentially a single row of trees remains. Images taken of the riverbank in the attachment titled "Site Photographs from Feb 2018" show the extensive undercutting of the one remaining large hackberry tree at this location. In 2016 the root system of this tree was not exposed. By February 2018, almost half the root ball was exposed.

While detailed measurements of bank scour have not been collected, it is abundantly clear that the riverbank is eroding.

Won't the rip rap increase flooding of the park and areas downstream?

The Selectboard agrees with the context assessment provided by DEC River Scientist Gretchen Alexander her March 23rd, 2017 memo titled "Fluvial Geomorphic Context of the Winooski River in Richmond" where she states:

"The challenge, of course, is that we often have community and personal infrastructure at odds and at risk with this physical process of channel adjustment. While it is often necessary to actively manage a river channel to protect societal infrastructure (roads, bridges, houses, etc.), it is important to acknowledge that the river will respond to this type of management, usually through erosion in another location."

And goes on to say...

"I would challenge residents and town officials to think about where they would "draw the line". That is, are there any changes that could be made to the use of the park that could allow the river more space to express its physical imperatives while still maintaining the current uses? Are there locations where the width of the woody riparian buffer (trees) could be increased to both enhance stream health and increase flood resilience (a 100-foot minimum width is recommended on a river of this size)?"

The Selectboard has drawn a line regarding rip rap at Volunteers' Green targeting the first 300-foot immediately downstream of the bridge—the area that takes the brunt of the river's energy as it rounds the bend upstream. Downstream from here the Selectboard is interested in bioengineered efforts to enhance the stability of the riverbank and its floodplain, such as widening the forested buffer in the park. The Selectboard would appreciate the Conservation Commission's help in developing such a project.

Will the rip rap harm the salmon redds found in the Winooski immediately adjacent to Volunteers' Green?

In his July 25, 2018 email titled "Re-Richmond redds, rip rap and floodplain restoration" (attached), U.S. Fish & Wildlife Service fisheries biologist Nick Staats states "I'm not worried about the rip rap" regarding the salmon redds (depressions in gravel created by spawning salmon to lay eggs) identified in the Winooski River adjacent to Volunteers' Green.

Why should the Conservation Reserve Fund be used to harden the riverbank?

The following section of this application details how this project connects to the Conservation Reserve Fund's eligibility criteria. Regarding precedent, the Conservation Commission has previously voted in favor of funding the hardening of the downstream side of Gillete Pond using poured concrete, an action that will have a much more significant effect on the nature of the project area than the project proposed here.

Project Significance – Volunteers' Green is a Vital and Important Natural Asset and Meets Conservation Fund Eligibility Criteria

Volunteers' Green is of vital importance to the community. Long-term protection of this community asset is a priority for the Selectboard. The park must be viewed in context with other town recreational facilities and needs. Other than the relatively small Browns Court Ballfield, the town owns no other active recreation property, nor any property that offers the same variety of uses, serving as many people. The recently purchased Andrews Forest is similarly restricted from development through conservation easements, and properties on Cochran Road also lie within the floodplain. Therefore, replacement of Volunteers' Green would mean an additional capital expense to the town through property acquisition and improvements. For that reason, protection of the rivershore from loss by erosion is of high importance. Volunteers' Green is unique in what it offers Richmond and cannot easily be replaced.

This project fits the following General Criteria

- III.A2:** Permanently preserving the integrity of the park through erosion management.
- III.A4:** The plan to improve and preserve the area currently known as the canoe access will enhance access to the river. This will make it both easier and safer for

canoeists/kayakers/floaters to get in or out of the river and to the top of the river bank at an area close to the parking area – which is the common destination.

- III.A5:** Erosion loss of the park property itself is the target of this project.
- III.B1:** Erosion prevention eliminates a common source of sediment pollution from the river during high water and flooding.
- III.B7:** See III.A4 – the size of the stone used and the configuration of the canoe access will improve access to the river’s edge for a variety of uses including fishing, swimming and canoe recreation. Currently, the river shore here is steep and muddy with tree roots and is impossible to access except at the existing canoe access.
- IV.C:** This preserves land of Richmond’s primary recreation resource—the town-owned Volunteers’ Green.

Project Schedule

The project commenced in late September and was completed by September 30, 2018.

Project Partners

The Town has full responsibility for the property and has no plans for partnering with other agencies or organizations. The Town intends to utilize a contractor to complete the work and a professional engineer to oversee and permit the work.

Financial Information

The Town of Richmond is requesting from the Conservation Reserve Fund \$35,000 for the stabilization project, amounting to a 50% share of the anticipated construction costs. A detailed budget is presented below:

Item	Scope	Budget
Construction	Partial clearing and shaping of slope; placement of stone for stabilization; restoration of bank and grassy areas	\$137,200 (\$35,000 CRF; \$102,200 unrestricted surplus funds)
Engineering	Bidding; Construction management	\$3,522.91 (\$3,522.91 unrestricted surplus funds)
Permits		Already in possession

Long-term Plans

The Town believes this is a long-term fix for this section of the park. It is understood by the Town that river shore erosion is also occurring further downstream, although the town has no immediate plans to address this. It is conceivable that the town will seek to armor the river shore in other locations of the park if future conditions warrant that action.

List of Attachments

- Site Photographs from February 2018
- VT Stream Alteration Permit #SA-5-9030, includes design documentation from East Engineering (Tyler Billingsley)
- Development Review Board approval decision
- Army Corps of Engineers Permit
- Meeting Notes - Erosion Control/Stream Alteration Site Visit – Richmond VT (6/18/2009) from Cathleen Gent, Richmond Town Planner.
- Memo: Fluvial Geomorphic Context of the Winooski River in Richmond, VT. (3/23/2017) from Gretchen G. Alexander, River Scientist, River Corridor & Floodplain Protection Program to Town of Richmond Conservation Commission.
- Email: RE: Richmond's Winooski bank stabilization quandary (5/25/2017) from G. Alexander & C Brunelle DEC River Corridor & Floodplain Protection Program to Jon Kart (Richmond gadfly).
- Email: Staats-USFWS Re-Richmond redds, rip rap and floodplain restoration (7-25-2018)