

**New York City Department of Environmental Protection
Bureau of Water Supply**

**Stream Management Program
Revised Request for Approval for Water Quality Stream Projects
on the Batavia Kill at Red Falls (Schoharie Watershed)**

February 2021

*Prepared in accordance with Section 4.6 of the NYSDOH
2017 Filtration Avoidance Determination*



Introduction

The 2017 Filtration Avoidance Determination (FAD) requires the Stream Management Program (SMP) to design and construct at least 24 Water Quality Stream Projects (WQSPs) that have a principal benefit of water quality protection or improvement. In 2017, DEP nominated the Red Falls segment of the Batavia Kill as two projects (a downstream Project 1 and an upstream Project 2) to count towards this FAD requirement (Figure 1). Since DEP nominated the projects, site assessment and design revealed that Project 1 is significantly larger in scope, scale and complexity than initially thought. DEP is seeking approval from the New York State Department of Health (NYSDOH) to separate the downstream project as two distinct FAD projects (Figure 2). DEP will update plans for the upstream project once the assessments and design have progressed further.

Background

Red Falls is one of the largest and most complex stream segments to be addressed by the SMP to date; it is more than 6,000 feet in length and includes multiple large hillslope failures. The Batavia Kill Stream Management Plan prioritized the Red Falls segment based on water quality impacts from excessive erosion into extensive glacial lacustrine clay and till deposits, and mass wasting of steep hillslopes exceeding 50 feet in height as depicted in Figures 3, 4 and 5. When initially proposed, geomorphic and water quality monitoring had identified the reach as the largest contributor of turbidity and suspended sediment in the Batavia Kill watershed. At this time, monitoring shows the Batavia Kill is still one of the largest contributors to turbidity and suspended sediment. Initial restoration plans by Greene County Soil and Water Conservation District (GCSWCD) in 2005 were abandoned when an archaeologically sensitive area was discovered in the floodplain preventing site disturbance and equipment access. Flooding associated with Tropical Storm Irene in 2011 resulted in considerable site damage, including a partial re-routing of the Batavia Kill through the archaeologically sensitive area, thus enabling restoration as a viable option.

Projects Nominated in 2017

Preliminary assessments by GCSWCD led to DEP's 2017 nomination of two lengthy reaches of the Batavia Kill at Red Falls (upstream and downstream) for full channel restoration to restore stable stream function and reduce impacts to water quality from fine sediment loading. These are the two original Red Falls FAD projects and are depicted in Figure 1. At the time, DEP thought that this entire segment, exceeding 6,000 feet in length, could be treated with two projects. However, the projects were nominated at the conceptual stage before fully advancing into the assessment and design phases. Since 2017, the downstream reach has advanced considerably and the assessment and design status described immediately below. The upstream reach requires additional assessment, and DEP will update plans for that reach once assessment and design has progressed further.

Revised Nominations in 2021

Extensive assessment and design by GCSWCD since the 2017 project nominations necessitate that the original Project 1 (the downstream reach) be split into two separate projects. GCSWCD has completed the following assessments necessary for restoration design: topographic survey, archeological assessment, hydrologic assessment, geomorphic assessment, tree survey, wetlands delineation assessment, soil test pits, and hydraulic analysis including a no

rise (base flood) evaluation. These assessments were incorporated into an overall design which, due to project size, complexity of construction, and the narrow in-stream construction window of August 1 to September 30 (northern long-eared bat and trout spawning restrictions), are planned for construction over two seasons. For this reason, DEP is requesting that the previously approved Project 1 (the downstream project) be divided into two distinct WQSPs, now called Project 1 and 2 and depicted in Figure 2.

The two projects independently meet or exceed the characteristics of several WQSPs previously nominated and approved as FAD deliverables. Specifically, these projects equal or exceed the water quality impact, length, complexity and cost of the previously approved Stony Clove at Wright Road, Beaver Kill at Van Hoagland Road and Warner Creek Site 1 and Site 2 projects. It is noteworthy that GCSWCD has designed these projects in-house with subcontracted assessment assistance. The vast majority of projects of this scale (including those listed above) have been designed by consulting engineers.

These two new projects are described below and their details are summarized in Table 1. Each project has two phases that require a two-year construction timetable. Each project contains significant mass hillslope failures that are contributing high turbidity and sediment load to the Batavia Kill. The two distinct project areas are separated by 430 feet of stable bedrock-controlled stream channel.

- Project 1 begins at the Red Falls and extends upstream 1,606 feet.
 - Phase 1, completed in 2020, included construction of 2,900 feet of entrance road to access the stream work; tree clearing along the length of the access road, floodplain areas and dewatering channel; establishment of staging and stockpile areas; and construction of a 1,250-foot long passive rock-lined dewatering channel to facilitate access and dewatering for both WQSPs. The final cost of Phase 1 was \$564,766.
 - Phase 2 includes stream restoration and floodplain creation along 1,606 feet of channel starting from Red Falls and proceeding upstream. This phase will include construction of grade controls including boulder riffles and/or cross vanes, rootwad and log revetment, as well as streambank stabilization, floodplain grading and revegetation. The engineers' estimate for Phase 2 is approximately \$2.5 million and DEP anticipates construction 2021.
- Project 2 begins approximately 430 feet upstream of Project 1 Phase 2.
 - Phase 1 includes stream restoration and hillslope stabilization along approximately 585 feet of channel. This phase includes construction of boulder riffles and/or cross vanes, rootwad and log revetment, as well as large hillslope stabilization, floodplain grading and revegetation. The engineers' estimate for Phase 2 is \$975,000 and DEP anticipates construction in 2022.
 - Phase 2 includes site restoration including removal of the access road, restoration of the dewatering channel and site revegetation for both WQSPs. The engineers' estimate for Phase 2 is approximately \$300,000 and DEP anticipates construction in 2023.

- Future Project(s)
 - Assessments and design are ongoing for an additional Batavia Kill project or projects located immediately upstream of Project 2 in an entrenched section of the valley with high banks on both sides. The project reach is approximately 3,500 feet long. Topographic survey, archeology, wetland inventories and hydraulic modeling are complete, but will need update closer to construction. The design is currently in progress, but there have been various setbacks primarily due to constraints related to an existing private bridge, which significantly reduces channel capacity and results in excessive stream velocity, leading to design challenges. GCSWCD and DEP are working on this issue and will define discrete project areas to propose for WQSP designation in the future.

Table 1. Revised Red Falls project summary.

Project Name	Status	Construction Year	Length (Feet)	Cost
Project 1; Phase 1: Gravel Access Road and Rock Lined Dewatering Channel	Completed	2020	2,900 and 1,250*	\$564,766 (Final)
Project 1; Phase 2: Lower Reach Stream Restoration	Design	2021	1,606	\$2,507,740 (Estimate)
Project 2; Phase 1: Upper Reach Stream Restoration	Design	2022	585	\$975,575 (Estimate)
Project 2; Phase 2: Site Restoration (13.5 acres)	Design	2023	N/A	\$303,575 (Estimate)
Future Project(s) (upstream)	Planning	2024+	>3,500	N/A

* Note: these are road and dewatering channel lengths.



Figure 1. Project reaches as conceptually nominated in 2017.



Figure 2. Red Falls Project 1 and 2 locations as updated in this 2021 request.



Figure 3. Rotational slide and channel incision in the 2021 Project 1 reach.



Figure 4. Erosion into the glacial moraine in the 2021 Project 2 reach.



Figure 5. Rotational slide in process with the massive section of earth slowly sliding down the slope towards the Batavia Kill within the 2021 Project 2 reach.