Conley Natural Stream Design Project Proposal

for Clean Water Act Section 319(h) FY 2006 Incremental Funds

West Virginia Stream Code: WVP-4-M

A Tributary of Opequon Creek, in the Potomac Direct Drains Watershed
Berkeley County, WV

Canaan Valley Institute
in cooperation with
West Virginia Department of Environmental Protection

July 2008

Budget:
319 Funding: $96,887
Non-federal Match: $64,592
Total: $161,479

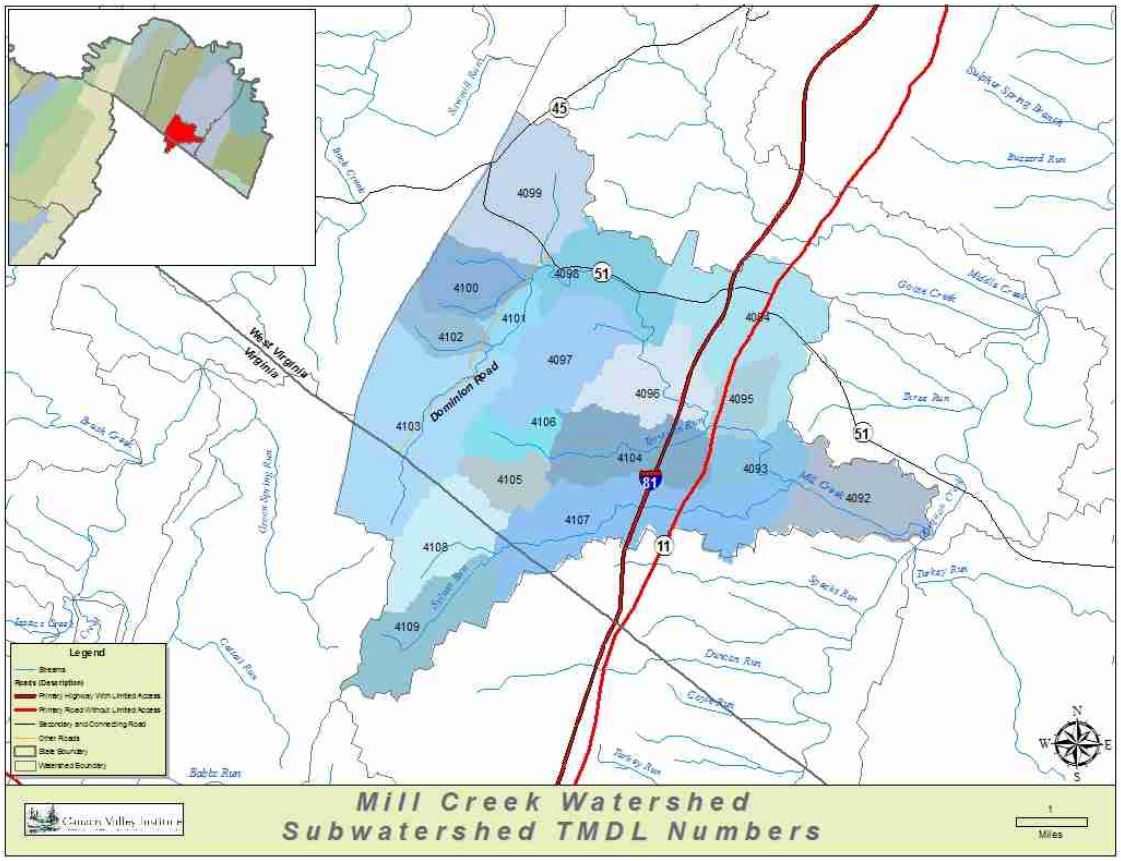
Project Summary

This project is intended to reduce the sediment load in Mill Creek of the Opequon Creek watershed, Berkeley County, WV. A single natural stream design project on approximately 1225 feet of Mill Creek near the headwaters is expected to reduce the total sediment load entering the creek by 205.3 tons/year.

Background

This project is located in Mill Creek of the Opequon Creek watershed. The Mill Creek watershed comprises subwatersheds #4092-4018 in the TMDL for Selected Streams in the Potomac Direct Drains. It is 14.5 miles long (one mile of which is in Virginia), and its watershed covers 29.75 square miles. It flows north to Gerrardstown, WV, then bends toward the east and flows through orchards, new developments, older residential areas, the town of Bunker Hill, and on to Opequon Creek. The proposed project site is on the Mill Creek mainstem, in the southern end of subwatershed #4101 (Fig. 1).

Figure 1. Location of the Mill Creek watershed, Berkeley Co., West Virginia. In the inset, the red area is the Mill Creek watershed, and the gray area surrounding and including it is the Opequon Creek watershed.



The bedrock geology that Mill Creek flows through is mainly composed of limestone and shale.

The watershed includes diverse land uses, with forest, grassland, urban pervious, and pasture comprising over 80% of the total area. The watershed above the project site consists mainly of these four land uses plus orchards. To the east of Mill Creek in the vicinity of the project site, orchards have

recently been sold and could be converted to residential use. Yet another significant land use change could result from the recent purchase of forest acreage by a local brick company on the east side of North Mountain, which is the western edge of watershed, if the company begins to conduct shale mining there.

Mill Creek is on the 303(d) list for biological impairment, with organic enrichment and sedimentation determined to be the biological stressors. Mill Creek is listed for fecal coliform impairment as well. Therefore, it received total maximum daily load (TMDL) allocations for sediment and fecal coliform.

The Opequon Creek watershed is the number one priority in West Virginia's Chesapeake Bay cleanup effort. Therefore, nitrogen, phosphorus, and sediment loads in Opequon Creek and its tributaries need to be reduced. Reducing excess nitrogen and phosphorus should have the added benefit of decreasing the organic enrichment of these streams, thereby promoting abundance and diversity of the benthic community.

This proposal consists of a natural stream design (NSD) project to improve the hydrology and habitat of more than 1200 feet of Mill Creek and to address the sediment TMDL placed on Mill Creek. Canaan Valley Institute (CVI) is the lead agency for this proposal. CVI is a nonprofit, non-advocacy organization that helps people identify, solve, and implement solutions to serious water issues impacting their daily lives. CVI's technical capabilities and human resources come together to help community organizations, government agency partners, and businesses solve critical water quality problems. Over our 12 year history, CVI has provided services to over 350 community groups and local government entities. Our core service area is the Mid-Atlantic Highlands, encompassing the mountain regions of Maryland, Pennsylvania, Virginia, and West Virginia. CVI's headquarters is in Thomas, West Virginia, and we have field offices in Charleston and Morgantown, West Virginia. CVI also has staff stationed in Abingdon, Virginia, and Hagerstown, Maryland.

CVI has worked closely with West Virginia Department of Environmental Protection (DEP) for more than ten years, supporting the development of watershed associations, community based assessments of water quality issues, and community-led planning for identifying and developing wastewater and stream restoration projects. CVI is also a regional leader in providing education on stream restoration and decentralized wastewater treatment to community groups, regulators and agency staff, and professionals. CVI staff also design and oversee the construction of NSD stream restoration projects. CVI is nearing completion on a large-scale watershed restoration project in Tucker County, West Virginia that serves as a model and education resource for this type of work in the region.

CVI also has an EPA-approved organization quality management plan that includes a stream restoration quality assurance project plan and quality assurance statement for all education activities. CVI also uses an industry standard quality assurance statement for wastewater engineering work.

Kristin Mielcarek, Watershed Circuit Rider, will be the lead staff for this project and she can be reached via email at kristin.mielcarek@canaanvi.org, by phone at 304/678-3446. She will be supported by a variety of technical and administrative staff from CVI's headquarters. These staff can be reached at 800/922-3601 and the headquarters' mailing address is PO Box 673, Davis, WV, 26260.

Goals and Objectives

A single Natural Stream Design (NSD) project on approximately 1225 feet of Mill Creek is expected to stabilize the stream reach, enhance the ecological habitat, develop a native riparian buffer, reduce streambank erosion, and reduce the total sediment load entering the creek by 205.3 tons/year, Although this project alone will not achieve meeting water quality standards, it accounts for 26.7% of the 768.1 tons/year reduction called for in the TMDL. This project will also serve as a demonstration project for educating landowners on future streambank stabilization efforts as described in the "Watershed Based Plan for Mill Creek."Already, an additional proposal has been submitted for 319 funding, which will result in over 85 tons/year of sediment reduced.

Project Description

The proposed project location is on both banks of the Mill Creek mainstem in the northern part of the property known as Mountain View Farm. The proposed project includes 1225 feet of Mill Creek with actively eroding banks. Since cattle are the primary cause of instability for the reach, it is of utmost importance that cattle be removed from the active stream channel and floodplain. The landowner is currently working with the USDA Natural Resources Conservation Service to complete the exclusion of cattle from the stream.

The upper section of this stream within this property is a reference reach and should be protected as one of the most intact stream reaches (in geomorphic and ecologic terms) observed in over 8 years in the field (RC Gaujot, 2008). Bedrock and several 300 – 400 year old sycamore trees line the channel and help stabilize the stream and 'anchor' the thalweg (Fig. 2). The stream proceeds down valley and meets a limestone bedrock outcrop and high yield spring on the river right. This spring seep created a colluvium of material and a seeping wetland. The reach does lack a solid understory and native grass species.

Figure 2. The upper portion of Mill Creek within this property does not require natural stream restoration , though it does lack a solid understory and native grass species.

Leaving the reference reach section, the stream makes a left turn, flows about 300 feet and downcuts about 2 feet, about 1 average bankfull depth. Below this headcut, the stream has incised into the valley and has been trampled and grazed. Both banks are primarily unvegetated and actively eroding vertically and laterally. This reach is pictured in the cover photo. Full cattle access and lack of vegetation are the main cause of instability.

The landowner recently installed livestock exclusion fencing through the Environmental Quality Incentives Program (EQIP). The landowner has dramatically reduced the presence of invasive multiflora rose bushes in the riparian area in this upper portion. Native plantings of understory and grass species would work well with the sycamore overstory and springs.

In the lower portion of the reach contained within this property, approximately 1225 feet of stream, the headcut is severe, and must be stabilized soon in order to inhibit the upstream migration of the headcut into the reference reach. The ideal Dimension, pattern, and profile will be established using Wood/rock combination structures A native riparian buffer will be established to protect the restoration.

Partner Involvement

- *Canaan Valley Institute (CVI)*: will administer grant funding, and will design and oversee the Natural Stream Restoration Project.

- *West Virginia Department of Environmental Protection*: will administer grant funding and collection of milestones; assist with education and outreach and monitoring of the project. The Potomac Basin Coordinator will assist CVI with project implementation and management.

- *USDA-NRCS:* will continue to provide technical assistance to the landowner for installation of livestock exclusion fencing through federal cost-share programs.

- *Opequon Creek Project Team:* will provide assistance with outreach regarding this project.

- *West Virginia Division of Highways and Local businesses such as Inwood Quarry* might provide materials or in-kind services toward this project.

Education and Outreach

Canaan Valley Institute's Watershed Circuit Rider and West Virginia DEP's Potomac Basin Coordinator will conduct a non-technical site visit of the completed project for Opequon Creek Project Team (OCPT) members and other interested parties in order to demonstrate and promote natural stream restoration in the watershed. Opequon Creek Project Team (OCPT), the local nonprofit watershed group that identified Mill Creek as its priority watershed, is committed to participating in implementing its Watershed Based Plan. The OCPT is actively engaged in projects that will lead to a reduction in pollutants such as nutrients, sediment, fecal coliform bacteria, and trash entering Opequon Creek and its tributaries. Through these projects they have gained visibility in the community for the issue of water quality in its streams and creeks. They communicate both through conversation and direct mailings with residential and agricultural landowners to learn about their concerns regarding the Opequon Creek watershed and in turn to share information about the need for BMPs such as proper

septic system maintenance, stormwater runoff, riparian forest buffers and livestock fencing. Being involved in this NSR project will allow the Team to add this to the list of BMPs that it promotes. The Team has walked and photographed the length of Mill Creek to build an information database to underpin the Mill Creek Plan which is how the landowner for this project proposal was first contacted. OCPT is expected to:

- Include an article about this project in the quarterly newsletter that is circulated via its extensive contact list
- Include a summary and photos of this project on its actively-maintained website, www.opequoncreek.org
- Pursue publicity for this project through the local newspaper, the Martinsburg Journal

OCPT through its activities and community network will contribute strongly to the education and information component of this proposal.

Maintenance of Effort

Canaan Valley Institute, and WV DEP's Potomac Basin Coordinator will ensure effectiveness and sustainability of practices installed through this project by providing technical assistance and coordination to the participating landowner. The contract for the NSD project will be a 5-year contract, ensuring best management practices (BMPs) will be maintained through the life of the contract. With West Virginia's participation in the Chesapeake Bay Tributary Strategy effort, support will be provided for BMPs following the completion of the 319 grant. Financial support will be given as funding allows.

Monitoring

CVI will complete this project under our existing, EPA-approved Quality Management Plan, stream restoration QAPP (valid through 2012), and geospatial activities QAPP (valid through 2010). CVI will provide an as-build survey and drawings of the project immediately after construction, will visually inspect the site for damages and stability issues on an annual basis. Monitoring of the NSD project will be performed to meet or exceed the State and federal monitoring requirements. For example, WVDEP recommends at least 5 years of annual photography, with additional photo-monitoring every 2 years thereafter until 10 years post-project.

The WV DEP Potomac Basin Coordinator will ensure that volunteer sampling of the benthic macroinvertebrates occurs at the site before and after project construction. This will be done in accordance with the WV Save our Streams program, at least at Level II.

Schedule of Milestones

Task 1: Stream Morphology, Reference, and Functional Assessment	October 2008
Task 2: Morphological Data Development	November 2008
Task 3: Natural Stream Design and Engineering Evaluation	December 2008
Task 4: Restoration Plan and Permitting	January 2009

Task 5: Drawings and Construction Cost Estimate	March 2009
Task 6: Construction Bidding Conferences	April 2009
Task 7: Design Stakeout	June 2009
Task 8: Construction Oversight	July-September 2009
Task 9: As-Built Survey	October 2009

Budget

Salaries	Request to 319 program	Non-federal match	Totals	Description of match
CVI Staff for implementation	$12,226	$8,139	$20,365	In-kind contribution of reduced fees by CVI
total	$12,226	$8,139	$20,365	
Fringe Benefits (32%)				
total	$3,912	$0	$3,912	
Supplies				
stakes, pins, tape for NSD design and layout, permit fees	$1,350		$1,350	
total	$1,350	$0	$1,350	
Contractual				
NPS Program match		$12,153	$12,153	NPS program contribution
NSD project construction/material	$68,426	$44,300	$112,726	Donated rock, planting materials and labor provided by local group
total	$68,426	$56,453	$124,879	
Travel				
mileage, per diem, lodging based on federal guidelines	$4,000		$4,000	
total	$4,000	$0	$4,000	
TOTALS				
Indirect Costs	**$6,973**	**$0**	**$6,973**	
Direct Costs	**$89,914**	**$64,592**	**$154,506**	**Percent non-federal match**
Total Costs	**$96,887**	**$64,592**	**$161,479**	**40%**