



Governor's Award for
ENVIRONMENTAL
Excellence

2019



APPLICATION

Commonwealth of Pennsylvania
Tom Wolf, Governor



Department of Environmental Protection
Patrick McDonnell, Secretary



Project Application Form

A.	Name of organization: Valley Creek Restoration Partnership (VCRP)
B.	<p>Brief paragraph about the organization:</p> <p>VCRP is an unincorporated association, formed in 2002, that is centered on improving and preserving the quality of the Valley Creek (VC) watershed as the creek flows through a greatly developed landscape from Chester County through Valley Forge National Historical Park (VFNHP) near Washington's Headquarters, into the Schuylkill river. It was intended to benefit from the expertise of:</p> <p>(1) The partnering organizations: Green Valleys Watershed Association, Open Land Conservancy of Chester County, Valley Forge Trout Unlimited, West Chester Fish, Game & Wildlife Association, and the Chester County League of Women Voters;</p> <p>(2) Governmental advisors: East Whiteland Township, Tredyffrin Township, Chester County (CC) Conservation District, CC Water Resources Authority, Pennsylvania Fish & Boat Commission, PA Department of Environmental Protection, VFNHP, and the U. S. Geological Survey; and</p> <p>(3) Research, education, and communication advisors: Cabrini College, Stroud Water Research Center, Drexel University, Villanova University, Meliora Design, Viridian Landscape Studio, and PECO.</p> <p>Two members from each nonprofit partner and advisory partners make up the Board membership. VCRP proactively identified projects, sought funding, and determined how projects were to be executed. When possible, funding and responsibility for projects were given to member organizations.</p>
C.	<p>Title of project:</p> <p>Valley Creek Environmental Stewardship and Economic Development in an Urbanized Watershed</p>
1.	<p>Provide a description of the project including, characteristics, objectives, goals, benefits and outstanding attributes:</p> <p>The VCRP committed to restoring VC by restoring a tributary from the headwaters downstream, by controlling the stormwater runoff entering the drainage, guided by research and technical reports of its partners. To reduce stormwater runoff, both managed and unmanaged runoff on the watershed were targeted for projects. Work continues to be done with a high ratio of benefit to cost, as there is no ongoing administrative structure to support or budgeted expenditures, instead it is shared by the stakeholder partners.</p> <p style="text-align: center;">Time Line and Projects: Five year periods</p> <p>2004 through 2008:</p> <ol style="list-style-type: none">a. VFNHP Buffer Replacement Project installed five new deer fence enclosures including planting and live staking of 4,000 feet on both sides of VC, with maintenance. Following two hurricanes and destruction, the enclosures were re-established. Two other volunteer maintenance projects repairing fences and replanting with native shrubs.b. Valley Creek Summit (understanding health of VC, identify and prioritize problems, historical and current conditions, outline roles, actions, next steps of the Partnership, produce and disseminate a report). Report produced, <i>Valley Creek Summit I Report</i>, 2004.c. Fishing Deck accessible for people with physical disabilitiesd. Basin Retrofit of Sidley Rd. Stormwater Basin, achieved with East Whiteland Townshipe. ArcView GIS Training; VC Stream Bank Stabilization.f. Crabby Creek Study for Restorationg. Summit on Crabby Creek – <i>Crabby Creek Watershed Study</i>.h. Crabby Creek Pilot Project, maximizing habitat and further stabilizing the creek

- i. Demonstration Rain Gardens for residents in Crabby Creek watershed
- j. Valley Forge Sewer Revetment Project in the VFNHP
- k. Crabby Creek Relocation and Restoration of 1,200 feet of stream; removed Crabby Creek out of the sewer line with an rapidly eroding stream bank and infrastructure
- l. Design of Four Infiltration Devices to reduce stormwater runoff, and Final Report, *Crabby Creek Methodologies, Assessment and Planning*
- m. Crabby Creek Restoration Extension
- n. Cool Valley Preserve riparian buffer plantings
- o. VC Habitat, Woody Debris Study and Habitat Assessment
- p. Turnpike Widening Plan Review for stormwater runoff
- q. Supported Tredyffrin Township Maude Circle Infiltration Project
- r. Cedar Hollow stream buffer plantings
- s. Temperature monitoring project: Ten hobo temperature loggers recorded at 15 min. intervals on a Cedar Hollow run tributary on the main stem of VC. Results showed

2009 through 2013:

- a. Hillside elementary School Green Roof
- b. Upper Crabby Creek Fish Habitat Restoration
- c. Crabby Creek Restoration Repairs (two projects) with multiple tree planting events
- d. Robins Lane Infiltration Trench
- e. Brook Trout transfers from French Creek State Park to Crabby Creek
- f. Turnpike Widening Plan Reviewed for inconsistencies.
- g. Participated in *Valley Creek Watershed Stormwater Management Plan*, 2010, by Chester and Montgomery Counties, part of the PA Act 167 Phase II Stormwater Plan, submitted to PA DEP.
- h. Conestoga High School Bioinfiltration Swales to slow runoff, remove suspended solids and metals, enhance infiltration
- i. Conestoga High School Sidewalk Infiltration Beds and other projects
- j. Backyard Ecology Projects: Watershed-wide outreach project to homeowners to reduce runoff with pocket stormwater controls.
- k. Basin Retrofit Assessment Study in Tredyffrin and East Whiteland Townships for Five Under-street Stormwater storage and infiltration basins.
- l. Crabby Creek Brook Trout Restoration (two projects), followed by electroshock research of outcome of Restoration Project Crabby Creek showed Brook Trout reproduction
- m. Miller Preserve stream bank restoration and riparian buffer project
- n. Installation of two rain gardens in Wilson Farm Park in Tredyffrin Township
- o. Tree plantings (two projects) in Park
- p. Reduced mowing project in Wilson Farm Park

2014 through 2018:

- a. Valley Creek Preserve riparian tree plantings
- b. Hilltop Lane Infiltration Trench
- c. Friendship Drive Infiltration Trench.
- d. Wilson run Modeling and Equipment
- e. Lorimer Preserve riparian buffer tree plantings
- f. Crabby Creek tree plantings between sewer line access path and stream (two projects)
- g. Electroshock research of Brook Trout Restoration Project in Crabby Creek; no Brook Trout were found, attributed to lack of pools and riffle sequences, and large volume runoff on steep gradients
- h. Weevil experiment to reduce invasive *polygonum perfoliatum*
- i. Upper Crabby Creek Infiltration Trench
- j. Continued Review of Turnpike widening plans
- k. Stormwater Field Trip for Tredyffrin residents to learn how to control and use stormwater to counter the extreme rain events and flooding of 2018, and to improve the health of the natural lands.
- l. Upper Crabby Creek Infiltration Trenches (three installed)
- m. Continued review of Turnpike widening plans
- n. Developed research project on barcoding of Integrated Biotic Index

<p>o. Collection systems, pavers, and rain gardens for 1” rain event for residences.</p>
<p>2. What results did your project achieve to improve Pennsylvania’s environment?</p> <p>Valley Creek in Chester County is probably the highest quality stream that is so close to a metropolitan area any anywhere. It is marked by steep hills of schist to the north, and the valley bottom is limestone aquifer and springs that feed the stream. It is an Exceptional Value Class A wild trout stream that courses through brownfields, landfills, office parks, and the dense Philadelphia western suburbs. The VCRP’s mission is to protect and improve the quality of Valley Creek, and its watershed using a project oriented approach. It has been effective to seek out and influence environmental efforts by working with governmental decision makers at all levels in these projects. VCRP has proactively developed and provided educational programs for the general public and children, adolescents, and young adults.</p>
<p>3. How does this project serve the public’s best interest and provide environmental protection?</p> <p>Over the 14 years of work by VCRP, interactions with county, municipal and private agencies increased their awareness of water quality needs.</p> <p>VCRP was recognized by the Chester County Board of Commissioners (Valley Creek Watershed Stormwater Management Plan (7/30/10) as a “well-run, active, and highly motivated watershed partnership ... that builds strong connections with municipalities, land owners, and funding entities.” (p. 202). They noted its accomplishment of numerous on-the-ground improvement projects including basin retrofits, stream channel restoration, residential rain gardens, and education events, <i>all produced through volunteer efforts</i> (p. 67). The report acknowledged that achievement of the plans for stormwater improvements in the VC required key stakeholders including the VCRP partners and advisors (p. 171). The VCRP, as well as the Valley Creek Trustee Council, watershed coordinators from CC Conservation District, and the PADEP worked together to improve and increase the number of stewardship projects accomplished in the watershed. Cost effectiveness is an attribute of the projects of the VCRP because no funds are spent to support the VCRP.</p> <p>The townships on VC became aware of VCRP and its efforts, and a shift occurred in municipal recognition of the problems of stormwater, and in municipal planning to consider infiltration and evapotranspiration in their projects to prevent rainwater from becoming stormwater.</p>
<p>4. In what ways did the project involve community members, government officials, or employees?</p> <p>The VCRP historically and presently holds monthly meetings that are open to all stakeholders and to the public. It established partnering as the modus operandi for watershed restoration, and new groups continue to come to the VCRP for this joint approach, such as PennState Master Watershed Stewards. VCRP generated over \$3 million in grants for projects that brought together community members, the VFNHP, government officials and project staff, township engineers, restoration specialists, and watershed associations. This joint, partnering approach prevented competition for resources, and strengthened the knowledge base, experience, and shared values of watershed restoration and water quality in southeastern CC. See attachments: Map of Work Sites and photos of projects.</p>
<p>5. How does this project use innovative technology or solutions to achieve results?</p> <p>1) <u>Reduce stormwater discharge to VC tributary:</u> VCRP used innovative underground infiltration and detention stormwater basins on three streets transecting halfway up a steep ridge in Tredyffrin in a densely populated residential community, where stormwater runoff problems were causing flooding of homes and erosion and sedimentation problems in Crabby Creek.</p> <p>2) <u>Prevent stormwater and salt runoff to VC and innovate new construction techniques:</u> Negotiations with the PA Turnpike Commission (PATC) over many years resulted in changed plans for the bioretention basins, which were re-designed with an emended soil layer consisting of 60-65% sandy loam and 35-40% compost, or, 30% sandy loam, 30% coarse sand, and 40% compost. This innovated soil composition helped to reduce PATC’s rate of highway slip ramp basin failures due to inadequate specification and the use of native soils that have high clay contents and did not infiltrate and control the rate of discharge. Karst formations also limited infiltration and all of the PATC basins failed on this location. DEP has guidance on slow release methods, but without specific parameters for the rate of dewatering. Rock layers with pipe were embedded in the amended soil, resulting in low flow discharge that emulates ground flow. Specified orifice sizes were introduced to reduce rate of discharge to imitate base</p>

flow when infiltration was not possible, as natural base flow can be specified. VCRP also requested level spreaders and hard sills to prevent erosion through rocks.

3) Develop a new policy for private and public agencies to develop working partnerships. VCRP tested a proactive partnership model that brought together volunteers from environmental groups and advisors from townships, government agencies, and academic institutions. Responses from all groups and continuing and new interest from stakeholders validate the success of this policy.

6. In what ways does this project educate people about environmentally responsible practices?

VCRP's objectives to restore natural stormwater hydrologic cycles and restore watersheds led to learning more about community relationships by working with people on boards, staff, community organizations, and residents. VCRP learned to persist patiently in getting project agreements.

One purpose of VCRP is to be a clearinghouse to promote coordinated implementation of the Valley Creek Trustee Council Valley Creek Restoration Plan and the Chester County Watersheds Plan. Formal educational methods were also used. Throughout the projects, reports have been distributed, presentations were made to the Schuylkill Watershed Congress and to the Villanova Urban Stormwater Partnership, and demonstrations were made for the public. Two Earth Day Celebrations were created in the Crabby Creek Park and Wilson Farm Park in Tredyffrin to help residents understand models of a healthy stream, disastrous runoff effects, and best practices for managing stormwater on residents' own properties. A Storm Water Field trip attracted many residents from Tredyffrin who experienced rain events that overwhelmed their stormwater infiltration infrastructures. VCRP contrasted two streams with the ability to respond or with devastating erosion as a result of heavy rains in 2018.

7. Can you describe the potential economic impact your project created?

VCRP organized plantings of 4068 trees and 1450 live stakes by 542 volunteers along more than 4385 lineal feet of stream, plus rain gardens and a green roof. These riparian buffer plantings began more than 10 years ago, in 2004.

Riparian buffers provide monetized benefits from ecological services of over \$10,000/acre/year in the Delaware River basin; annual savings of suburban residential stormwater treatment per acre of riparian forest is \$540-\$1035/year (Rempel and Buckley, ECONW, 2018). The total riparian buffer area planted by VCRP was 31 acres, thus providing *\$310,000 each year* of benefits to the area in improved water quality, carbon storage, air quality, flood prevention, property values, wildlife habitat, and outdoor recreation. Included are the savings resulting from the buffers for suburban stormwater treatment of \$12,420 to \$23,805 *per year*. The costs of flooding are spread among many the downstream agencies and property owners, and the floodplain protection afforded by restoring riparian areas are borne by upstream landowners and municipalities. Thus, the benefits of VCRP projects, that include infiltration trenches in suburban areas, rain gardens, green roof, and retrofitted basins, are spread beyond the areas of direct work. A meta-analysis of wetland studies reported flood attenuation benefits that were a mean of \$732/acre/year.

Economic benefits from the riparian buffers will bring return on all VCRP grant funds for stream restoration projects in 7.1 years, and sooner if calculating costs of plantings only. This is qualified by the data showing that benefits begin within 5-10 years post-planting, and by 15-30 years full benefits are found.

8. How does this project address sustainability, climate change, or pollution prevention?

Sustainability, pollution prevention, and adaptive responses to climate change all require approaches that are not bound by government lines. VCRP's noncompetitive partnering approach brings more intellectual and technical resources to a watershed, and its model of collaboration could be broadly applied. The partnered approach can embolden an area to learn from the lessons of failures and successes, and to face challenges of doing new and different projects. (1) VCRP worked with the MS4 and Pollution Reduction programs of East Whiteland and Tredyffrin and contributed significantly to their ability to achieve state water quality standards. (2) VCRP focused on restoring VC by focusing on one tributary at a time from the headwaters down, developed demonstration projects to improve stormwater runoff, and then later took an educational focus. (3) VCRP projects were integral in providing historical and cultural support for designation of Valley Creek as Exceptional Value. This resulted in changes to the Knickerbocker Landfill banks that were resulting in more trash flowing downstream, which was resolved as a result of the EV designation.