

LITITZ RUN WATERSHED - 20 YEAR UPDATE

A COMMUNITY IMPROVING ITS WATER QUALITY

Mission Statement

Improve the quality of life within the Community by developing and implementing a Comprehensive Plan for the Litz Run Watershed. This endeavor will focus the community on improving its water quality through a comprehensive long-term watershed management strategy. The strategy combines techniques in natural resource management, land use planning and education.

Litz Run Watershed Alliance

The watershed improvements are overseen by this active watershed alliance, incorporated in 1997 as a cohesive group of individual citizens, businesses, farmers, conservation organizations and local, state and federal government representatives joined together for a common purpose: a comprehensive approach to sustainable water quality and water resources within the Litz Run Watershed.

Our Story

In 1998, a group of local community leaders, volunteers, business owners, teachers, planners and elected officials embarked on an ambitious plan to improve the water quality of Litz Run. Armed with a clear, community-based mission statement and implementation plan, these pioneers of watershed restoration, achieved their vision 10 years later, when in 2009 Litz Run was re-designated a Cold Water Fishery (CWF), upgraded from its previous designation as a Warm Water Fishery (WWF). This was only the second time a stream had been re-designated in PA. The success of this effort galvanized community support with on-going restoration work, maintenance, monitoring, and a goal of redesignating portions of Litz Run to High Quality, which is unprecedented, especially in agricultural regions.

What is a Watershed?

A watershed represents the land area that water flows over on its way to a stream, river or lake. We are all a part of a watershed community. The decisions we make daily regarding the way we treat the soil, water, air, plants and animals around us affects our watershed as well as larger watersheds downstream. Litz Run drains 17 square miles beginning in Litz Springs Park, flowing east through Litz Borough and Warwick Township where it picks up flows from the Santo Domingo Creek, Hubers Run and numerous springs. Eventually it flows into the Conestoga River leading to the Susquehanna River and ultimately the Chesapeake Bay.

Notable Accomplishments

- Litz Run was redesignated from a Warm Water Fishery to a Cold Water Fishery in 2009
- Construction of the only two Critical Aquifer Recharge Area (CARA) restorations in Pennsylvania at Rock Litz and Butterfly Acres
- The location of the first regional water quality facility in PA at Dean Saylor Park
- The restoration and planting of over 5 miles of stream and riparian corridor
- Creation of over 15 acres of wetlands
- Creation of approximately 30 acres of native grass and wildflower meadows
- Approximately 20,000 linear feet of in-stream habitat and/or streambank improvements
- Over 7,000 trees planted
- A Fish Study conducted in 2020 found wild Rainbow Trout at six of the twenty sites and sites harbored enough wild salmonids (3 with 2 age classes or YOY) to be considered for designation as wild trout waters by PFBC.
- Over 8,000 5th grade students in Warwick School District spent one day in the watershed as part of Watershed Awareness Days.
- The TMDL has been achieved and collective discharges do not exceed that daily limit
- Conservation plans have been completed for all active farms in Warwick Township that includes 103 farm tracts and approximately 4,490 acres.

Awards

- US EPA National Showcase Watershed - one of only 12 showcase watersheds in the United States
- Governors Award of Environmental Excellence - 1999
- Smart Growth Leadership Awards - Lancaster County Planning Commission - 2007
- EPA's regional Source Water Protection Award - 2012
- Pennsylvania Planning Association - Outstanding Planning Award 1999
- PA/DeI Chapter American Society of Landscape Architects - Merit Award 1999

Next Steps

A Strategic Watershed Program is currently being implemented to guide the continued restoration of the Litz Run Watershed toward a sustainable future. This program identifies strategic, concentrated resources as a means of efficiently attaining the greatest improvement. The Tributary Focus Areas identified on this map are an example of this approach wherein tributaries with poorer water quality have been prioritized for restoration. With the new and innovative tools available, we are able to synthesize real-time data and mapping layers to best manage the outcomes. The key elements of this program include:

- Watershed Action Plan** - a quantitative tool that focuses on community engagement and documenting and prioritizing existing and proposed improvements.
- Watershed Report Card** - this is the qualitative tool that provides a science-based evaluation of the health of the watershed. It uses real data to evaluate performance indicators such as nutrients, water temperature, etc. that measure the health of the watershed and identifies potential threats.
- Watershed-Wide Permit** - this permit utilizes the established "National Pollutant Discharge Elimination System (NPDES) Permit Development" process that establishes the rules for compliance. This regional approach to permitting multiple projects within the watershed helps to improve efficiency and reduces costs.

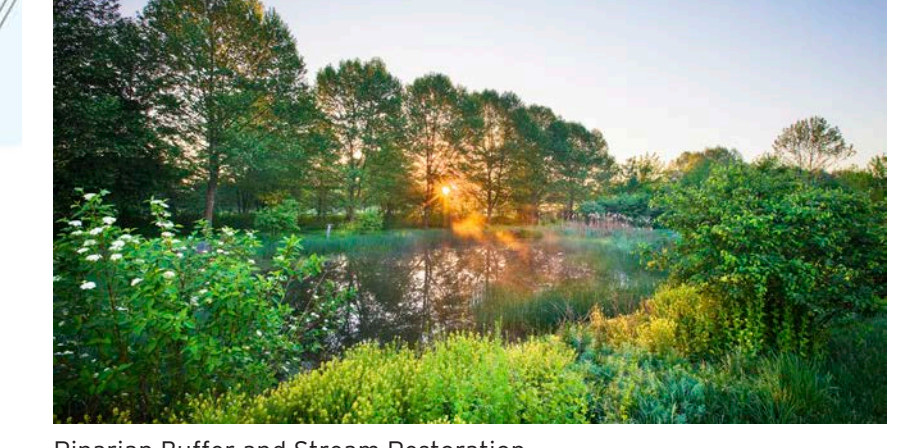
Existing BMP Reference List

Project #	Catchment Name	Project Description
1	Litz Run	Ag BMP Plan was implemented on private property in 2009
2	Litz Run	Private Habitat, Ag BMP, and Riparian Buffer implemented on private property located on Oak Street adjacent to Saylor Park
3	Litz Run	Private Habitat, Ag BMP, and Riparian Buffer implemented on private property in 1996
4	Litz Run	Private Habitat, Ag BMP, and Riparian Buffer implemented on private property in 2005
5	Litz Run	Private Habitat, Ag BMP, Stormwater BMP, and Riparian Buffer implemented on private property in 1996
6	Litz Run	Private Habitat, Ag BMP, and Riparian Buffer implemented on private property in 2001
7	Litz Run	Private Habitat, Ag BMP, and Riparian Buffer implemented on private property in 2001
8	Litz Run	Riparian Buffer and Ag BMP implemented on private property in 2006
9	Litz Run	Riparian Buffer and Ag BMP implemented on private property in 1998
10	Litz Run	Riparian Buffer and Ag BMP implemented on private property in 1998
11	Litz Run	Riparian Buffer and Ag BMP implemented on private property in 1998
12	Litz Run	Riparian Buffer and Ag BMP implemented on private property in 1998
13	Litz Run	Riparian Buffer and Ag BMP implemented on private property in 1998
14	Litz Run	Riparian Buffer and Stormwater BMP implemented on Warwick Township property in 1997
15	Litz Run	Riparian Buffer, Riparian Buffer, and Stormwater BMPs implemented on LHA property
16	Litz Run	Private Habitat, Riparian Buffer, and Stormwater BMPs implemented on LHA property
17	Litz Run	Private Habitat, Riparian Buffer, and Stormwater BMPs implemented on LHA property
18	Litz Run	Private Habitat, Riparian Buffer, and Stormwater BMPs implemented on LHA property
19	Litz Run	Private Habitat, Riparian Buffer, and Stormwater BMP implemented on Napaoli Commons property
20	Santo Domingo	Riparian Buffer, Stormwater BMP, and floodplain restoration implemented on Litz Springs Park at New Saylor Park
21	Santo Domingo	Riparian Buffer, Stormwater BMP, and Private Quality facility implemented on Litz Springs Park at New Saylor Park
22	Santo Domingo	Riparian Buffer, Stormwater BMP, and Stream Restoration implemented on Litz Springs Park at New Saylor Park
23	Litz Run	Private Habitat, Riparian Buffer, and Stormwater BMP in addition to a possible Wetland Mitigation Measure implemented in 1994, 1996, 1997, 1999, 2001, 2002
24	Litz Run	Private Habitat, Riparian Buffer, Stormwater BMP, and Stream Restoration implemented on private property in 1995, 1996, 2002, 2004, & 2005
25	Litz Run	Private Habitat, Riparian Buffer, and Stormwater BMP implemented on Litz Run property located at Saylor Park
26	Litz Run	North Lane Rain Garden on Warwick Ambulance Property, Maintained by City of Warwick
27	Litz Run	Rain Garden implemented on Litz Run property located at North Lane adjacent to Oak Lane
28	Litz Run	Rain Garden implemented on Litz Run property located at North Lane adjacent to Oak Lane
29	Litz Run	Rain Garden implemented on Litz Run property located at Blackberry

Proposed BMP Reference List

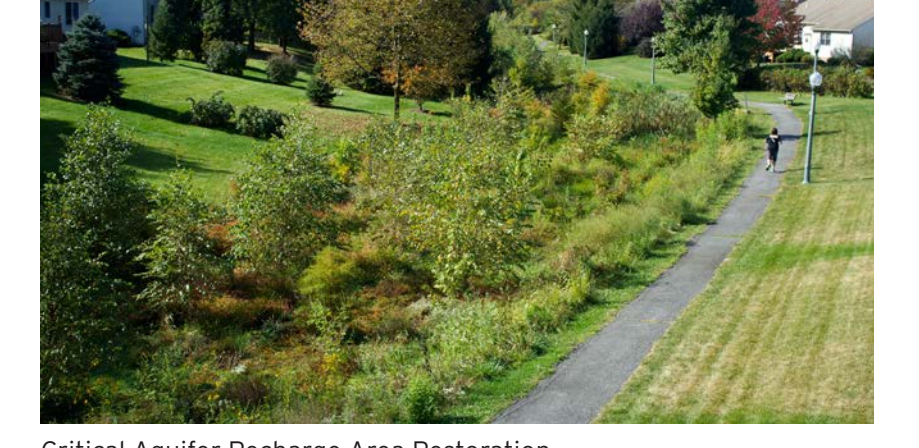
Project #	Catchment Name	Project Description
44	LIT to Santo Domingo	Streambank Restoration planned for implementation at in Dean Saylor Park
50	Santo Domingo	Streambank Restoration planned for implementation at the floodplain restoration in Litz Borough
57	LITZ Run	Private Habitat - plans planned for implementation on multiple properties in Litz Borough
62	Hubers Run	Private Habitat planned for implementation along Hubers Run on private property
63	Hubers Run	Riparian Buffer - CREP
64	Hubers Run	Riparian Buffer - CREP
65	Hubers Run	Riparian Buffer - CREP
66	Hubers Run	Riparian Buffer - CREP
67	Hubers Run	Riparian Buffer and Wetland Establishment implemented on Warwick Township property in Dean Saylor Park in 2019
68	Hubers Run	Pond Restoration planned for implementation on a private property
69	Hubers Run	Floodplain Restoration and Buffer planned for implementation along Santo Domingo Creek located at Rt. 80
70	Hubers Run	Private Habitat and Wetland Establishment implemented on private property in 2015
71	Hubers Run	Private Habitat and Wetland Establishment implemented on private property in 2015
72	LITZ Run	Private Habitat and Wetland Establishment implemented on private property in 2015
73	LITZ Run	Private Habitat and Wetland Establishment implemented on private property in 2015
74	LITZ Run	Private Habitat and Wetland Establishment implemented on private property in 2015
75	Lower New Haven	Stream Bank Restoration planned for implementation at Rusty Dam Rd
76	Upper New Haven	Stream Bank Restoration and floodplain restoration from Lands Valley Road to Conestoga River
77	Upper Litz Run	Stream Bank Restoration planned for implementation at Woodford Drive
78	Newport Square Watershed	Pond restoration planned for implementation along Clay Rd. located in another watershed
79	Upper Litz Run	Riparian Buffer planned for implementation in Bonfield Elementary School
80	New Haven	Private Habitat and Wetland Establishment implemented on private property in 2015
81	LITZ Run	Private Habitat and Wetland Establishment implemented on private property in 2015

Litz Run Riparian Park



Riparian Buffer and Stream Restoration

Butterfly Acres



Critical Aquifer Recharge Area Restoration

Legend

- EXISTING BMPs (Black circle)
- PROPOSED BMPs (White circle)
- LITITZ BOROUGH (Orange outline)
- DRY STREAM VALLEY (Blue outline)
- DAM REMOVALS (Yellow star)
- WARWICK/EPHRATA RAIL TRAIL (Red dashed line)
- PARCELS (Grey outline)
- LITITZ RUN WATERSHED (Black outline)
- ROADWAYS (Black line)
- STREAMS (Blue line)
- AG BMP PARCELS (Green hatched)
- PRESERVED FARMS (Yellow hatched)
- STREAM / FLOODPLAIN RESTORATION (Blue hatched)
- CRITICAL AQUIFER RECHARGE AREA RESTORATION (Green hatched)
- RIPIARIAN BUFFERS (Blue hatched)
- STORMWATER BMP AND IMPROVEMENT PARCELS (Green hatched)

Focus Area for Restoration Hubers Run Tributary



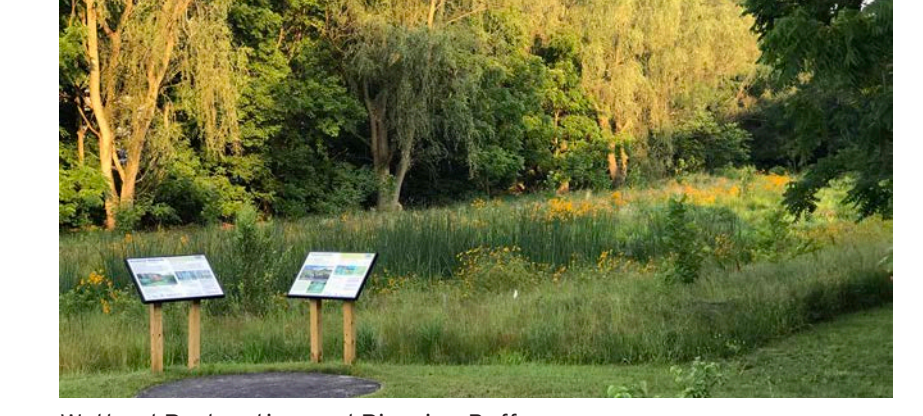
Hubers Run was relocated in the early 20th century and currently drains to the Litz Run at the Woodstream complex within Litz Borough. The relocation along with encroachments by landowners into the floodplain has contributed to the steep banks and increased erosion.

Focus Area for Restoration Moores Run Tributary



Moores Run includes a well established riparian buffer along the border with Newport Square. This buffer was established over 15 years ago, but the stream continues to erode and contributes sediment and bedload to the Litz Run.

Focus Area for Restoration New Haven Run Tributary



This tributary has been dramatically altered over the years and the breach of a pond and former dams contribute to the instability of the stream corridor. There are a number of old grade control structures including remnant pond berms, dams, and culverts which are in a compromised condition, and if they fail it could lead to significant head cutting and bank/bed erosion.

Education



Watershed Awareness Days - Over 8,000 Warwick School District Students have spent a full day in the Litz Run Watershed learning about the stream, watershed and the ecosystem improvements as part of their 5th grade curriculum.

Lisa Hostreiner, agriculture and earth science teacher at Warwick High School, "I get my students outdoors and into a real ecosystem, and they observe and learn so much about the importance of a riparian buffer and clean streams," she said. "They connect to the area and remember for many years what they did for Litz Run."

Warwick School District Integrated Curriculum - The Warwick School District has partnered with the LRWIA by involving their Biology and Chemistry classes in stream assessments during the spring and fall of each year. The stream assessments include chemical and macroinvertebrate monitoring, which is overseen by the Lancaster County Conservation District. This dates back to at least 1999.

Fish Study - A Fish Study conducted by Susquehanna University in 2020 found wild Rainbow Trout at six of the twenty sites and these sites harbored enough wild salmonids (3 with 2 age classes or YOY) to be considered for designation as wild trout waters by PA Fish and Boat Commission.

Healthy Watershed Goals - Hundreds of industry professionals, agency representatives, state and local government representatives and educators have toured the Litz Run Watershed to learn about and experience the restoration efforts first hand.

Public Education - Educational signs have been installed throughout the watershed to teach residents about the importance of water quality, groundwater recharge, native plants, stream/floodplain restoration, wildlife, etc. The large-scale watershed map is also displayed at public events and facilities such as the library, municipal buildings, etc.

Volunteers - Over 2,500 volunteers have been actively involved in watershed restoration, planting and clean-up since the beginning.

Natural Resource Management



Habitat and Bio-diversity - Results of the "Wild Trout Sampling Survey for the Litz Run Watershed" (Susquehanna University July 2020) indicate that the reproducing trout and restored habitat supports recommendations of an impaired waters plan and a Chesapeake Bay Pollutant Reduction Plan (CBPRP). Modeling results indicate that the watershed loading rates in all of the modeled watersheds is less than the regulated loading rate in the 2004 Litz Run Total Maximum Daily Load (TMDL) Plan. The TMDL was achieved and collective discharges continue to not exceed that daily limit.

Native Plant Guidelines and Ordinance - The use of native plants and the establishment of important native plant communities such as riparian buffers and wildflower meadows are critical to supporting wildlife and water quality in the watershed. Warwick Township developed guidelines for establishing native plant communities as alternatives to lawn and in important locations such as riparian buffers. The land development ordinance was also updated to include native plant requirements for land development.

Riparian Buffers - Streamside buffers and tree planting help filter pollutants and protect waterways. Over 5 miles of riparian buffer, including over 7,000 trees have been planted in the Litz Run Watershed.

Stormwater Management BMP's - Managing stormwater run-off and mitigating flood damage are a critical component of watershed planning. Numerous types of BMP's have become standard practice in land development, including infiltration basins, rain gardens, bio-swales, bump-outs etc. Examples of all of these types of BMP's can be found throughout the Litz Run Watershed.

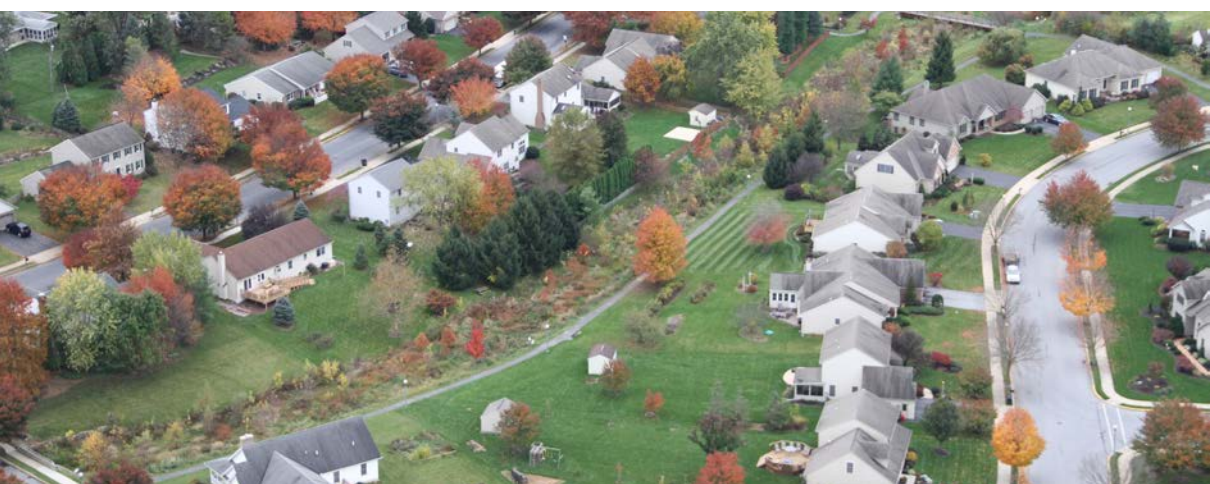
Regional Stormwater Management - strategic locations within the watershed have been identified where multiple benefits, including regional stormwater management, can be achieved. These large-scale projects are more cost efficient to maintain and provide an economy of scale over multiple, decentralized, small-scale projects.

Stream and Floodplain Restoration - over 3 miles of stream and floodplain restoration have been implemented over the last 20 years in the Litz Run Watershed. Various approaches were used depending on the understanding at the time and the goals of the restoration.

CARA Restoration - The Critical Aquifer Recharge Areas (CARA) were identified as part of the SRBC Groundwater Study. These unique and important locations provide the best opportunities for groundwater aquifer recharge. Two projects in the Litz Run watershed, Butterfly Acres and Rock Litz Campus, include CARA restoration to help ensure a sustainable water supply for the region.

Dam Removal - The historic dam at Millport Conservancy was removed in 1999. The dam removal allows fish passage through the lower section of the watershed and replaced an open water pond with a wetland habitat.

Land Use Planning



MS4 Permit Compliance - The 2013 assessment of the watershed conditions within Warwick Township using the MapShed model concluded that the municipality implemented adequate BMP's to satisfy the requirements of an impaired waters plan and a Chesapeake Bay Pollutant Reduction Plan (CBPRP). Modeling results indicate that the watershed loading rates in all of the modeled watersheds is less than the regulated loading rate in the 2004 Litz Run Total Maximum Daily Load (TMDL) Plan. The TMDL was achieved and collective discharges continue to not exceed that daily limit.

Joint Strategic Comprehensive Plan - The first Joint Strategic Comprehensive Plan was completed in 1999, bringing together all the municipalities in the Watershed, Litz Borough, Elizabeth Township and Warwick Township, as planning partners. Since that time, the plan is on its 3rd update and is currently being updated.

Farmland Preservation - Warwick Township implemented a successful Transfer of Development Rights (TDR) program to fund the farmland preservation program in the Township which celebrated preserving 3,000 acres of prime farmland.

Official Map - The Warwick Township Board of Supervisors adopted the updated Official Map of the Township of Warwick on November 18, 2020 (Ordinance 293). The Official Map illustrates the location of existing and proposed streets, trails and conservation areas within the Township. The Official Map assists the Township in the implementation of the Litz Run Watershed Joint Strategic Comprehensive Plan and also assists landowners in the determination of the uses and development of their lands within the Township.

Regional Recreation, Park and Open Space Plan - This plan identifies primary and secondary conservation areas and corridors that intentionally connect habitat and wildlife corridors in the watershed.

Wellhead Protection Program - Warwick Township and Litz Borough developed a joint Wellhead Protection Program, which aims to protect groundwater sources from contamination. As part of this program, the communities created a steering committee of local stakeholders to guide their steps, supported state-of-the-art farming techniques and plans, sponsored public education activities, completed watershed improvement projects and developed protective land use planning strategies and emergency water supply plans.

Agricultural Management Program - The Agricultural Management component of the Wellhead Protection Program includes a yearly assessment (soil nitrate test, manure analysis and crop consulting) of three farms in the wellhead protection area. Every four years the Lancaster Farmland Trust does farm visits to help farmers with compliance and to ensure that every farm has a plan.

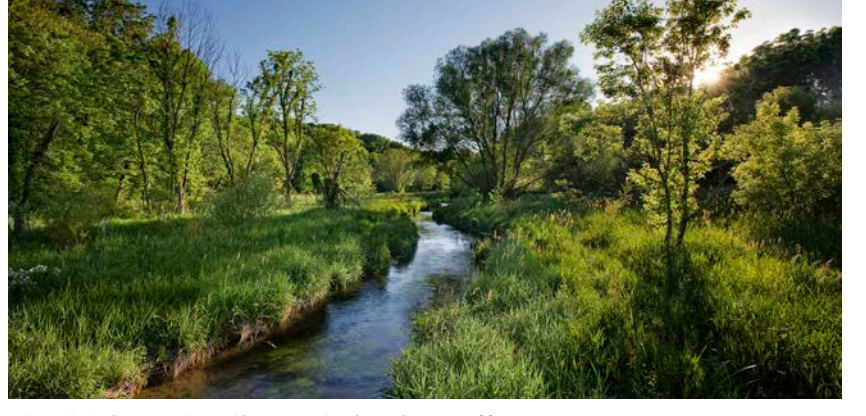
Groundwater Study - The Susquehanna River Basin Commission (SRBC) in 2005, completed a three-year case study to address water quantity issues in a 32,000-acre region in Northern Lancaster County that includes the Litz Run Watershed. The project assessed water use and availability within the study area and identified Critical Aquifer Recharge Areas (CARA) which, if functioning, provide significant water supply benefits.

"Protecting the sources of our drinking water benefits public health, our environment and our economic well-being, as well as our quality of life. Warwick and Litz have shown the way for more than a decade of working with farmers and others in taking responsible steps protecting drinking water supplies." - Andrew Gavin, Executive Director SRBC

Urban Growth Boundaries (UGB) - The communities within the Litz Run Watershed have established Urban Growth Boundaries as a proactive planning approach to growth management. The goal of these UGBs is to concentrate development around urban centers while protecting open space, preserving farmland and protecting natural resources.

Farmland Conservation Plans - Conservation Plans have been completed for all active farms in Warwick Township. These plans provide a guide for farmers to help them better manage and conserve natural resources. The plans include maps, soil information, existing conservation practices, and a schedule for implementation of management practices based on agreed to goals. The result is a comprehensive database of prioritized agricultural best management practices.

Pautz Mill Site



Floodplain Restoration and Riparian Buffer

Millport Conservancy



Streambank Restoration and Riparian Buffer

Project Partners



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Prepared by LandStudies, Inc.