The Town of Chester
Stormwater Mapping Report

Prepared by the

Warren County Soil & Water
Conservation District

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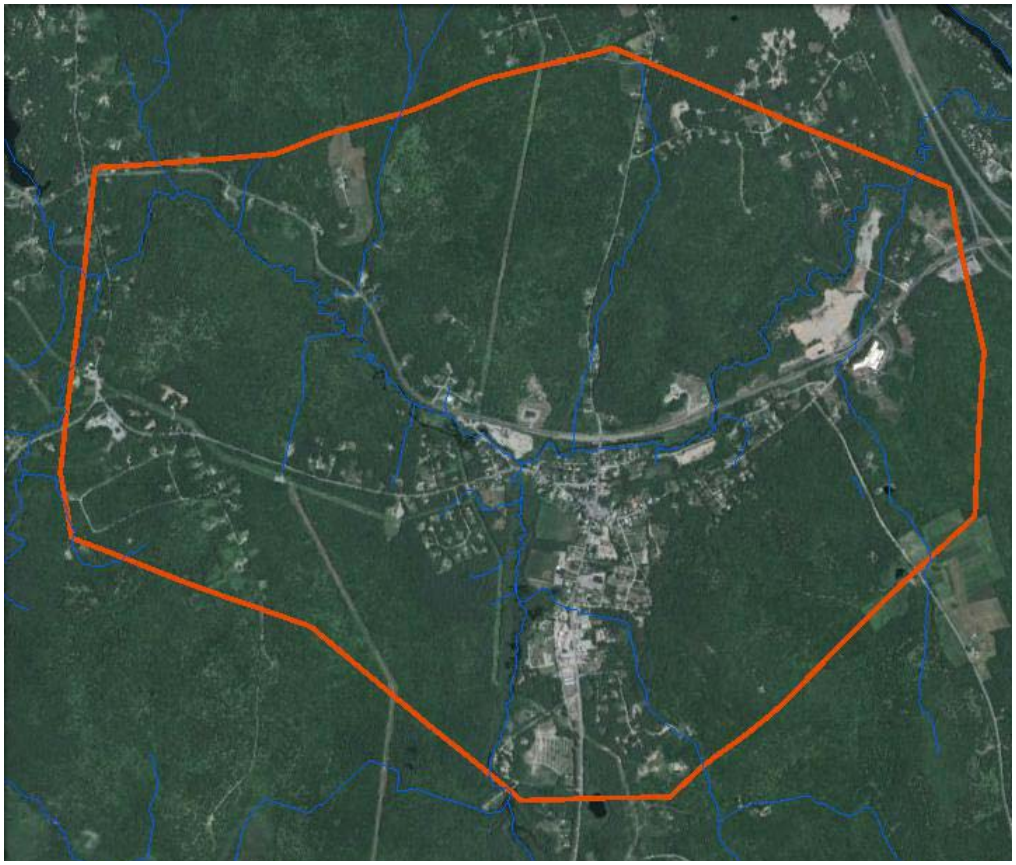

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Introduction and Location

The Town of Chester is a rural community in northern Warren County. It is located completely within the Adirondack Park bordered by the Hudson River on the western side and the Schroon River on the eastern side. Loon Lake and Friends Lake are also located in the Town of Chester. To the west is the town of Johnsburg, to the east is the town of Horicon, and to the south is the town of Warrensburg.

Chestertown takes pride in the rich natural resources of their community and strives to protect it. Chestertown is improving its management of stormwater by working with the Warren County Soil and Water Conservation District (District), who has extensive knowledge and experience in stormwater runoff assessments and retrofitting techniques. The District performed a comprehensive examination of roadway infrastructure within the hamlet in relation to stormwater issues and impacts. This assessment resulted in the identification of stormwater outfalls and areas of concern.

Stormwater Runoff

The impact of stormwater runoff on nearby waterways is a significant concern in any developed area. Runoff from roadways and parking lots is frequently channeled into drains and pipes, many of which outlet into a stream, river, or lake. Impervious surfaces such as roads, rooftops and asphalt parking lots do not allow water to infiltrate into the ground. As a result the sediment, phosphorus, de-icing materials (salt and sand) and other pollutants collected as stormwater flows across impervious surfaces often ends up in nearby waterbodies.

Improperly installed or poorly maintained roadside ditches may also contribute to stormwater runoff issues. A failing roadside ditch can allow the velocity of stormwater runoff to increase, resulting in higher levels of erosion and sedimentation. During warmer months, stormwater can be significantly warmer than a stream's water. This causes thermal pollution, which will negatively impact the aquatic communities.

Stormwater runoff is a major contributor of sediment which increases delta formation in waterways, and can also harm aquatic communities. Calcium from road salt can increase the risk of zebra mussel colonization by creating suitable habitat conditions for them in waterways. The transport of phosphorus by sediment can lead to multiple problems, including the eutrophication of waterbodies, increased habitat for invasive aquatic plants and animals, and the general deterioration of water quality.

Stormwater runoff directly impacts a waterway's long term-stability. As more development occurs, generally more water runs off the land into nearby

waterbodies, typically following a precipitation event. A large volume of water entering a stream in a short period of time can cause a widening of the stream channel in order to accommodate the increased volume of water. These channel widening processes result in accelerated stream bank erosion, and may lead to increased downstream deposition (deltas).

Stormwater runoff is generally considered to be the largest water quality impact in most developed watersheds. This report will provide the Town of Chester with the information that it needs to identify opportunities to address stormwater issues and their impacts within the Schroon River Watershed.

Assessment and Methodology

This report is a comprehensive examination of the stormwater systems on the hamlet area roadway network in the Town of Chester. The assessment consisted of a review of the stormwater runoff from the conveyance systems along all town, county, and state roads within the developed area of Chestertown. In addition, cost effective recommendations are detailed that will reduce stormwater pollutants and sediment input to the Schroon River and its tributaries.

District staff used Geographic Information System ArcView 9.3 (GIS) to assist with mapping of the town roads from existing data. These maps were referenced throughout the project as a guide and layout for the final stormwater identification and mapping. Each of the roads were travelled to document the stormwater networks, outfalls and storm drain inlets, as well as any point and non-point source pollution in the town. Data was collected using a Global Positioning System (GPS) Trimble Juno SB. Data was logged and photographed to document the physical conditions of stormwater runoff from the conveyance systems. The collected information was then processed in the office and the GPS data was differentially corrected for increased accuracy and exported as shapefiles for utilization in GIS maps.

Each area of concern identified as a contributor to erosion or stormwater pollution was reviewed for potential solutions. The recommendations identified in this report target areas of direct discharge to a waterbody, inlets that receive significant amounts of stormwater runoff from the roadway network and roadside ditch erosion to the conveyance system.

Stormwater Mapping and Retrofit Recommendations

Panther Mountain Drive East of NYS Route 9 Intersection: Map 1

The outfall just east of the intersection of Panther Mountain Drive and NYS Route 9 (Main Street) receives a substantial amount of stormwater from Panther Mountain Drive. The water is conveyed to a paved swale with a drop inlet that outfalls directly to a tributary of Chester Creek. In a 1" storm, about 500 feet of the road would drain approximately 6,231 gallons of water directly to this tributary. As the stormwater flows down Panther Mountain Drive it picks up pollutants that also make their way into the tributary of Chester Creek. In summer months, the water may also become superheated as it travels down the paved road, causing thermal pollution in the tributary. The recommended stormwater retrofit for this location would be to install two 4'x8' drywells that would capture and infiltrate the stormwater that runs down Panther Mountain Drive before it enters the drop inlet that outfalls into the tributary. One drywell placed near the Auto Value parking lot and one just east of the existing drop inlet to the tributary would capture and infiltrate this stormwater and allow sediments to settle out and recharge groundwater in the area.

Outlet to the tributary of Chester Creek on NYS Route 9 (Main Street)

Additional stormwater retrofits for the grassed area and parking lot just south of Panther Mountain Drive will greatly improve water quality in this location as well. The stormwater conveyance from the paved swale drop inlet to the outfall into the tributary is a grassed area that may be feasible for a surface infiltration retrofit. A vegetated bioretention area or rain garden in this location will capture additional stormwater and pollutants before flowing to the tributary. Surface infiltration is very beneficial in areas with high groundwater, utilities and other site constraints that prevent subsurface infiltration structures.

Paved swale from Panther Mtn Drive to tributary

The parking lot that adjoins the Panther Mountain Road and Route 9 intersection on the southeast side is another area of stormwater concern. The drop inlet is connected directly to the tributary and conveys numerous pollutants from Route 9 and the parking lot to Chester Creek. Depending on site constraints and the stormwater runoff flow path to this area, two 4'x8' drywells and/or permeable pavers in a section of the parking lot will reduce runoff to the drop inlet.

South of Intersection of Foster Flats Road and NYS Route 9: Map 2

Drop inlet to tributary on Foster Flats Road

The outfalls located at the intersection of Foster Flats Road and NYS Route 9 (Main Street) receive a significant amount of stormwater. A large section of Route 9 (approximately 1,320 feet) drains south through a series of drop inlets which outfall to a tributary of Chester Creek on Foster Flats Road. The southern portion of Route 9 (approximately 1,180 feet) drains through a series of drop inlets to a ditch, and from there into a drop inlet to a tributary of Chester Creek. In a 1" storm event, approximately 31,171 gallons of water would drain from northern and southern Route 9 to this tributary. Pollutants such as salt, sand and phosphorus are collected as stormwater flows down Route 9 from both sides of the road and ends up in this tributary.

Drop inlet directly on tributary between Foster Flats & Route 9

The installation of a 4'x8' drywell just north of the drop inlets to the tributary on Foster Flats Road would help alleviate a portion of stormwater by capturing and infiltrating the water before it enters the tributary. The drop inlet located directly over the tributary between Foster Flats and Route 9 is in a depressed vegetated medium. In Map 2, this area is labeled as "proposed bioretention", meaning if stormwater is able to settle around the drop inlet at a lower elevation, suspended solids will drop out and infiltration will occur. A small

bioretention area will reduce stormwater volumes and excessive nutrients from entering the tributary. Vegetation will uptake nutrients and the soils will reduce volume through infiltration.

Riverside Drive and LaFlure Lane: Map 3

Outlet to the tributary of Chester Creek on Riverside Drive

Riverside Drive and LaFlure Lane drain a substantial volume of stormwater west to a tributary of Chester Creek. Approximately 1,370 feet of Riverside Drive and 1,070 feet of LaFlure Lane flow to eight drop inlets that are piped to two outfalls. During a 1" storm, approximately 30,415 gallons of stormwater would drain down these roads and into the tributary. In addition to the large volume of stormwater collected in this drainage area, pollutants such as de-icing materials and petrochemicals from vehicles also make their way into the tributary through runoff. The installation of two drywells on Riverside Drive, one on each side of the road east of the intersection with Church Street, would assist in capturing stormwater from the entire eastern portion of Riverside Drive. Another drywell installed at the intersection of LaFlure Lane and Riverside Drive would collect additional stormwater before it enters the tributary.

Route 9 Outlet (Between LaFlure & Route 8): Map 4

Route 9 Outlet: Stormwater conveyance to Chester Creek

The portion of Route 9 between Riverside Drive and Route 8 drains approximately 850 feet of road north directly into Chester Creek through a series of eight drop inlets. The majority of this section of Route 9 has paved gutters which increase stormwater velocity and sediment transport. A section of Pine Street which drains west also contributes to the storm sewer system on Route 9.

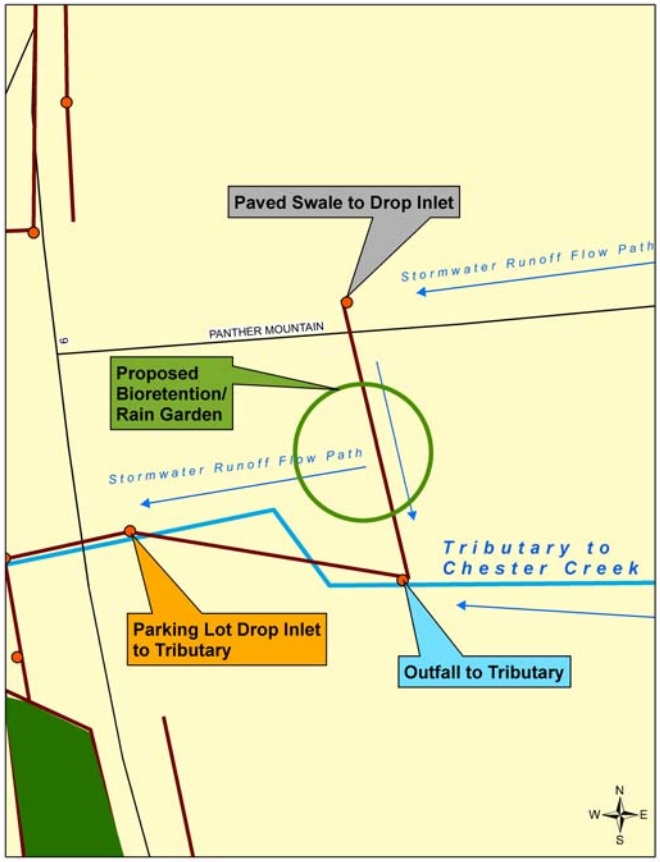
Depending on site constraints (groundwater, bedrock, utilities) in the Route 9 stormwater drainage area, the recommendation would be to retrofit multiple locations with infiltration devices. A drywell at the intersection of Pine Street and Route 9 will remove the Pine Street drainage from adding to the Route 9 outfall. An additional study will need to be completed to retrofit Route 9 and prevent stormwater from entering Chester Creek. If feasible, drywells installed on the west and east sides of Route

9 just south of the drop inlets at Church Street and LaFlure Lane will prevent a significant amount of stormwater from entering the storm sewer system.

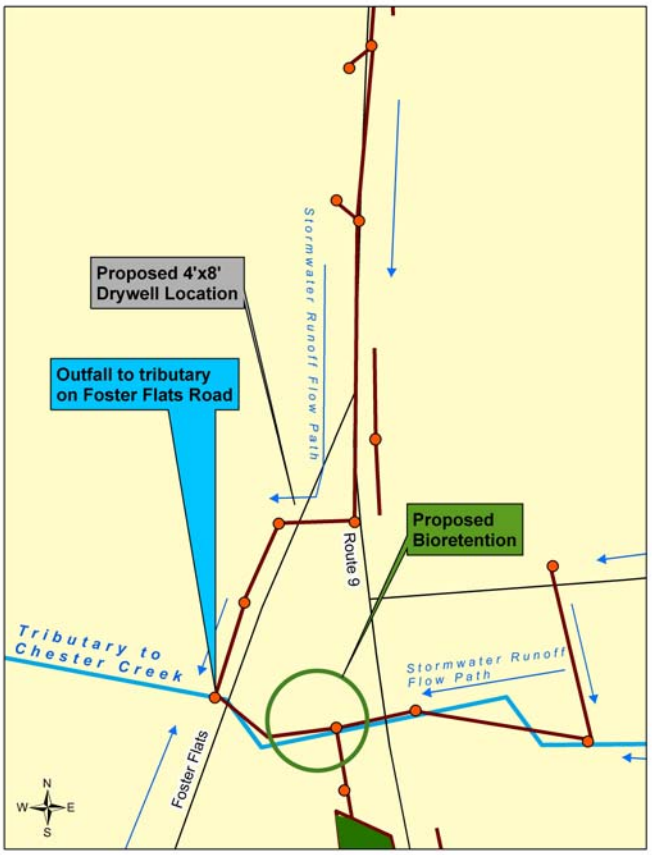
Conclusions

The urbanized area of the Town of Chester has seven drop inlets that are direct outfalls to Chester Creek, which is in the Schroon River Watershed. This report identified the main areas of concern for stormwater runoff to the creek and its tributaries. In order to maintain and improve the water quality of Chester Creek, we need to ensure that the stormwater that drains to it has been treated. This can be done through stormwater retrofits and the use of alternative de-icing practices. It is important to keep in mind that the cooperation of municipalities, landowners and agencies is necessary in order to resolve nonpoint source pollution issues. Stormwater runoff is one of the most significant contributors to nonpoint source pollution, and addressing the problem now will be both economically and environmentally beneficial for communities that are built around and depend upon these waterbodies.

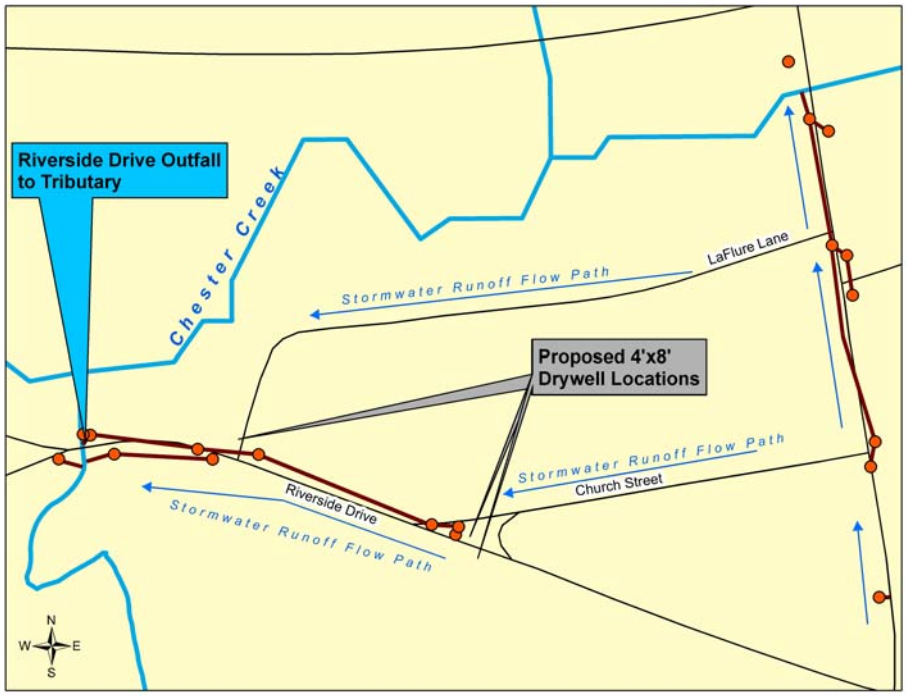
Map 1: Panther Mtn Dr. East of NYS Rt. 9 Intersection



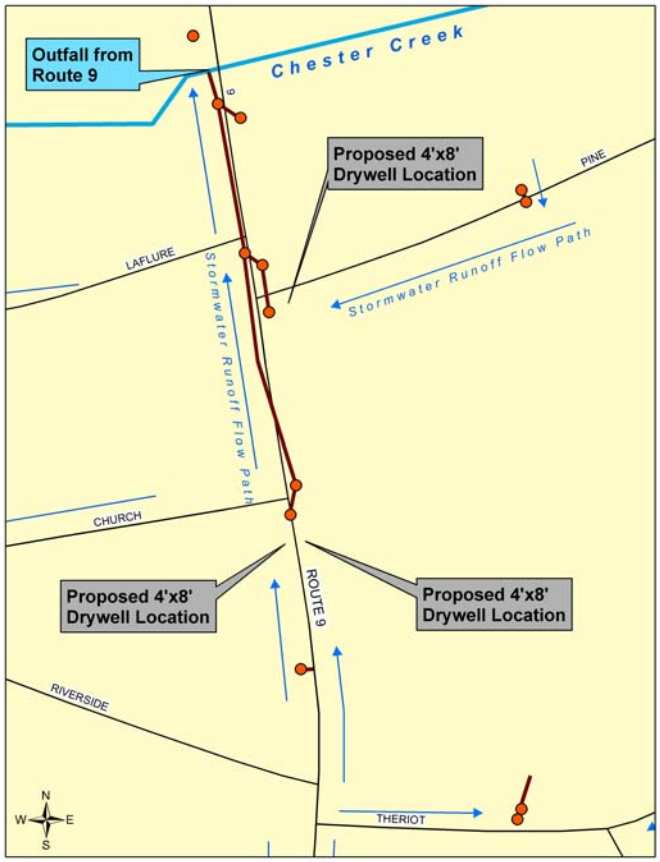
Map 2: South of Intersection of Foster Flats Rd. and NYS Rt. 9



Map 3: Riverside Dr. and LaFlure Ln.



Map 4: Rt. 9 Outlet (Between LaFlure Ln. and Rt. 8)



Appendix

Stormwater Resource Websites

- DEC Division Water Stormwater Webpage:
  - http://www.dec.ny.gov/chemical/8468.html
    - New York State Standards and Specifications for Erosion and Sediment Control ("Blue Book") Current Version: August 2005
    - New York Stormwater Management Design Manual Current Version: August 2005

- Lake George Park Commission:
  - http://www.lgpc.state.ny.us/

- Warren County Soil and Water Conservation District:
  - http://www.warrenswcd.org/

- The Lake George Association:
  - http://www.lakegeorgeassociation.org/

- The Fund for Lake George:
  - http://www.fundforlakegeorge.org/

- Soil & Water Conservation Society – Empire State Chapter:
  - http://www.swcsnewyork.org/

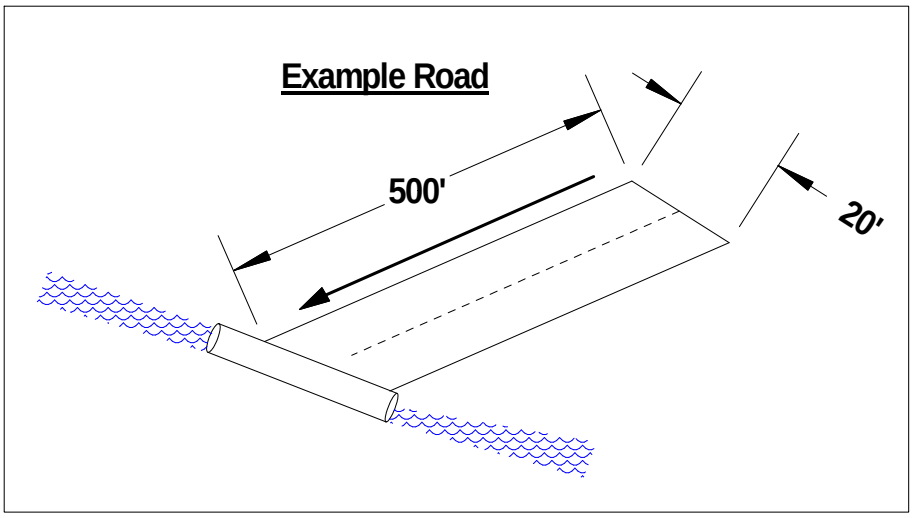
- SUNY- ESF Continuing Education – Stormwater Management Program:
  - http://www.esf.edu/outreach/stormwater/

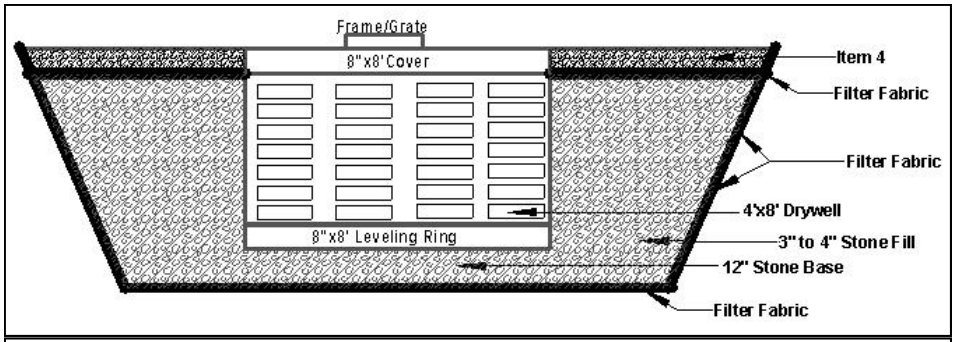
- Center for Watershed Protection:
  - http://cwp.org/

- EPA Stormwater Homepage:
  - http://cfpub.epa.gov/npdes/home.cfm?program_id=6

Estimated Volume For Typical Roadside Treatment

Example Road drains 500’ of length and 20’ of width to the low point in the topography. The low point in Example Road is a culvert with a stream flowing under the road. This section of Example Road drains 500’ x 20’ = 10,000 square feet of road drainage. To calculate volume of stormwater in a 1” storm divide 10,000 sq ft by 12” and you get 833 cubic feet which converts to 6,231 gallons of stormwater draining to the stream.





Cross section of a typical 4’ x 8’ Drywell