

**POLLUTANT REDUCTION PLAN
FOR IMPAIRED WATERS OF THE COMMONWEALTH
AND THE CHESAPEAKE BAY
SOUTH LONDONDERRY TOWNSHIP, LEBANON COUNTY, PA**

South Londonderry Township
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NPDES MS4 Permit PAG 133546
September 15, 2017
(REVISED xx, 2022)

Impaired Waters
Killinger Creek
Spring Creek
Quittapahilla Creek
Chesapeake Bay

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SUMMARY

Note: All revisions made on xx, 2022 are shown in blue text

South Londonderry Township has prepared this Pollutant Reduction Plan (PRP) for stormwater discharges of nutrients and sediment to surface waters in the Chesapeake Bay Watershed and to local surface waters impaired for nutrients and/or sediment to meet the requirements set forth by Pennsylvania's Department of Environmental Protection (PA DEP). As an MS4 community with locally impaired streams, South Londonderry Township must comply with Appendix D and Appendix E of the PAG-13 General Permit and must attach this PRP to the Notice of Intent (NOI) for General Permit Coverage. South Londonderry Township has invited public participation in the planning process by making this PRP available for a 30-day public review and comment period. A copy of all written comments received and the record of consideration of each one is included in Section A of this document.

This PRP calculates the existing loading of stormwater pollutants within the portion of the urban area which drains to an MS4 outfall location, in lbs/year; calculates the minimum required reduction in loading, in lbs/year; selects best management practices (BMPs) to reduce the loading rates; and demonstrates that the selected BMPs will achieve the minimum reductions. The pollutants of concern and associated required reductions for the Chesapeake Bay and locally impaired streams in South Londonderry Township are sediment (10%), phosphorus (5%), and nitrogen (3%). PA DEP allows using a presumptive approach in which it is assumed that a 10% reduction in sediment will accomplish a 5% reduction in phosphorus and a 3% reduction in nitrogen.

To improve water quality and meet the required pollutant reductions, South Londonderry Township proposes to stabilize approximately 1,840 LF of streambanks along Spring Creek west of Lingle Avenue, and to stabilize approximately xxx LF of streambanks along Killinger Creek south of N. Brandt Road. Planned improvements may include re-grading the streambank to eliminate the existing un-stabilized banks and planting native trees, shrubs, and perennial grasses to provide permanent stabilization. The expected benefits of these projects include minimizing flooding and the associated excessive erosion and sedimentation that occurs within the stream channel during storm events.

South Londonderry Township will prepare and submit updates on the progress of implementing this PRP with the MS4 Annual Report due each year to PA DEP by September 30th.

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SECTION A - PUBLIC PARTICIPATION

South Londonderry Township has promoted public participation and involvement in water quality decisions by making the Pollutant Reduction Plan (PRP) available for public review and comment as required. [A complete copy of the PRP was made available for public review on xxx, 2022, 68 days prior to the submission deadline on September 16, 2017.](#) This meets the PA DEP requirement that the PRP be published at least 45 days prior to the submission deadline. A public notice was posted in [The Sun](#) containing a description of the Plan, where it may be reviewed by the public, and the length of time made available for the receipt of comments. The municipality accepted both written and verbal comments from the public [until xx, 2022](#), 30 days after the public notice was posted.

South Londonderry Township did not receive any written or verbal comments during the 30-day public review and comment period and no changes were made to this Plan.

Attachment

[A1: A copy of the public notice](#)

[A2: A copy of the BOS Meeting Agenda and Meeting Minutes](#)

SECTION B - MAPS

South Londonderry Township has completed a series of maps that show the location of the municipal boundary, impaired and non-impaired streams, the 2010 urbanized area, stormwater system facilities, aerial imagery to identify land use and associated impervious and pervious areas, the storm sewershed boundary and area associated with each regulated MS4 outfall, and the location of proposed structural BMPs that will be implemented to achieve the required pollutant load reductions. Please note that some streams identified on the maps as impaired, may be impaired for reasons that do not need to be addressed by this PRP. This PRP addresses only those impairments that require Appendix D and/or Appendix E (see Section C for specific information on applicable impairments).

Attachments

B1: Hydrology Map

B2: Storm Sewershed Map

B3: Stormwater System Map

[B4: Proposed Stormwater BMP Map](#)

SECTION C - POLLUTANTS OF CONCERN

The following pollutants of concern for each impaired stream are based on the impairment listing provided in the MS4 Requirements Table provided by PA DEP:

- Killinger Creek (Appendix E): Nutrients and Siltation
- Spring Creek (Appendix E): Siltation
- Quittapahilla Creek (Appendix E): Siltation
- Chesapeake Bay (Appendix D): Nutrients and Siltation

If the impairment listed above is based on siltation only, a minimum 10% sediment reduction is required. If the impairment is based on nutrients (including Excessive Algal Growth and Organic Enrichment/Low D.O.), a minimum 5% Total Phosphorus (TP) reduction is required. If the impairment is due to both siltation and nutrients, both a 10% sediment reduction and 5% TP reduction is required. PA DEP allows using a presumptive approach in which it is assumed that a 10% reduction in sediment will accomplish a 5% reduction in phosphorus and a 3% reduction in nitrogen.

Please note that South Londonderry Township has no regulated outfalls and associated sewersheds in the Quittapahilla Creek Watershed.

Attachment

C1: MS4 Requirements Table for Lebanon County Municipalities

SECTION D - DETERMINE EXISTING LOADING FOR POLLUTANTS OF CONCERN

South Londonderry Township calculated the existing pollutant loading rates (lbs/year) for sediment, phosphorus, and nitrogen generated within their regulated/planning area in the Spring of 2017. The process used to perform this task is as follows:

1. Analyze existing topographic and contour information on a GIS map to delineate the drainage area/sewershed to each regulated MS4 outfall.
2. Use the Stroud Water Research Center Wiki Watershed Tool (<https://wikiwatershed.org>) to digitize the sewershed area; the Wiki tool identifies the land use category breakdown within each storm sewershed.
3. Remove any non-Urban Area that is located downstream of the Urban Area and/or does not flow into the Urban Area of the sewershed area.
4. Remove any area located outside of the municipal boundary.
5. Calculate the impervious and pervious areas within each land use category by using data provided by the National Land Cover Database 2011 (www.mrlc.gov). This data identifies the percentage of impervious coverage in four land use categories as follows:
 - a. Developed Open Space: 19% impervious
 - b. Developed Low Intensity: 49% impervious
 - c. Developed Medium Intensity: 79% impervious
 - d. Developed High Intensity: 100% impervious
6. Add the total impervious and pervious areas within each sewershed. Multiply the total impervious and pervious areas by the applicable loading rate as identified in the Chesapeake Bay Derived Developed Land Loading Rates for PA Counties. The Lebanon County loading rates for sediment, phosphorus, and nitrogen are as follows:
 - a. Developed impervious
 - i. Sediment: 1948.53 lbs/year
 - ii. Phosphorus: 1.85 lbs/year
 - iii. Nitrogen: 40.58 lbs/year
 - b. Developed pervious
 - i. Sediment: 269.81 lbs/year
 - ii. Phosphorus: 0.4 lbs/year
 - iii. Nitrogen: 27.11 lbs/year
7. If applicable, reduce the existing baseline pollutant loads by assigning credit for structural BMPs in each sewershed area implemented prior to development of this PRP. The procedure for this task is described below.
8. Reduce the existing baseline pollutant loads by removing pollutant loads from parcels with NPDES MS4 permits and Rights-of-Way (R-O-W) areas of State Roads, Railroads, PA Turnpike, airports, and any other parcel owned/operated by another MS4 permittee. The procedure for this task is described below.
9. Add the sediment, phosphorus, and nitrogen pollutant loads for each sewershed area by watershed area. Combine the total pollutant loads for each watershed to identify the total municipal baseline pollutant load.

Using the method described above, South Londonderry Township has identified the baseline pollutant loads for each watershed as follows:

Watershed	Sediment (lbs/year)	Phosphorus (lbs/year)	Nitrogen (lbs/year)
Killinger Creek	319,856	350	13,578
Spring Creek	503,182	563	23,251
Total	823,038	913	36,829

Attachments

- D1: Watershed Pollutant Load Summary
- D2: Outfall Information
- D3: Outfall and Sewershed Spreadsheet
- D4: Pollutant Load Calculations: Killinger Creek
- D5: Pollutant Load Calculations: Spring Creek
- D6: PA DEP BMP Effectiveness Values
- D7: Developed Land Loading Rates for PA Counties

SECTION E - SELECT BMPs TO ACHIEVE THE MINIMUM REQUIRED REDUCTIONS IN POLLUTANT LOADING

South Londonderry Township has identified the minimum required reductions in pollutant loading for each watershed:

Watershed	Required 10% Sediment Reduction (lbs/year)	Required 5% Phosphorus Reduction (lbs/year)	Required 3% Nitrogen Reduction (lbs/year)
Killinger Creek	31,986	18	407
Spring Creek	50,318	28	698
Total	82,304	46	1,105

BMP Option 1

South Londonderry Township plans to implement an 1,840 LF stream restoration project on a section of Spring Creek (Reach Code 02050305001104), located west of Lingle Avenue. This stream flows north through South Londonderry Township and eventually flows into the Swatara Creek. The proposed project is located just downstream of three regulated outfalls which have a contributing drainage area of approximately 147 acres, 30 acres of which is impervious area and 117 acres of pervious area. Stream restoration improves water quality by minimizing the amount of sediment and attached nutrients delivered downstream by unstable and actively eroding streambanks. The proposed reductions are calculated based on the effectiveness values identified in the PA DEP BMP Effectiveness Table as follows:

Sediment: 44.88 lbs/ft/yr
 Phosphorus: 0.068 lbs/ft/yr
 Nitrogen: 0.075 lbs/ft/yr

Proposed BMP	Watershed	Calculated Sediment Reduction (lbs/year)	Calculated Phosphorus Reduction (lbs/year)	Presumed Nitrogen Reduction (lbs/year)
1,840 LF Stream Stabilization	Spring Creek	82,579	125	1,105*

*South Londonderry Township will use the presumptive approach that assumes if the required minimum sediment reduction is achieved, then the required minimum nitrogen reduction is achieved.

BMP Option 2

South Londonderry Township plans to implement a 1,600 LF stream restoration project on a section of Killinger Creek (Reach Code 02050305004340), between N. Brandt Road and Hinkle Road. This stream flows north through South Londonderry Township and eventually flows into the Quittapahilla Creek. The proposed reductions are calculated based on the effectiveness values identified in the PA DEP BMP Effectiveness Table as follows:

Sediment: 44.88 lbs/ft/yr
 Phosphorus: 0.068 lbs/ft/yr
 Nitrogen: 0.075 lbs/ft/yr

Proposed BMP	Watershed	Calculated Sediment Reduction (lbs/year)	Calculated Phosphorus Reduction (lbs/year)	Presumed Nitrogen Reduction (lbs/year)
1,600 LF Stream Stabilization	Killinger Creek	72,482	109	120*
*South Londonderry Township will use the presumptive approach that assumes if the required minimum sediment reduction is achieved, then the required minimum nitrogen reduction is achieved.				

Once these projects are implemented, the achieved sediment load reduction will total 155,061 lbs/year which exceeds the required 82,304 lbs/year by 72,757 lbs/year.

Because South Londonderry Township is located entirely within the Chesapeake Bay Watershed, the calculated reductions shown above will meet the pollutant reduction requirements of the Chesapeake Bay PRP.

Attachments

- E1: Expert Panel - Stream Restoration
- E2: Urban Stream Restoration Fact Sheet

SECTION F - IDENTIFY FUNDING MECHANISM

South Londonderry Township plans to consider many sources of funding to implement the proposed stormwater BMPs identified in this Plan. The anticipated funding source to implement the stormwater BMPs may include any of the following:

South Londonderry Township General Fund: The Township may plan to budget sufficient funds each year of the five-year permit term (2018-2023) to fully fund the implementation of all stormwater BMPs to meet the required pollutant reductions.

PENNVEST: The Pennsylvania Infrastructure Investment Authority (PENNVEST) provides funding for urban stormwater and agricultural BMPs.

Growing Greener Grants: Growing Greener provides state funds to address environmental concerns, including the negative effects of stormwater pollution on water quality. These grants vary in availability and total funding dollars.

PA DEP's Urban Stormwater BMP Grants: As part of the Local Stormwater BMP Implementation Program, PA DEP has provided grants to communities located in the Chesapeake Bay Watershed to reduce stormwater runoff to local waterways. These grants vary in availability and total funding dollars.

Collaboration: South Londonderry Township will continue to look for other funding opportunities to implement stormwater BMPs by collaborating with nearby municipalities, government agencies, and other environmental organizations including, but not limited to: the Lebanon County Clean Water Alliance and the Lebanon County Conservation District.

National Fish and Wildlife Foundation (NFWF): The NFWF provides funding on a competitive basis to projects that sustain, restore, and enhance the nation's fish, wildlife, plants and habitats for current and future generations.

SECTION G - IDENTIFY RESPONSIBLE PARTIES FOR OPERATION AND MAINTENANCE (O&M) OF BMPs

All the identified stormwater BMPs must be maintained on a regular basis, after fully implemented, to ensure they continue to provide water quality benefits as designed.

Parties Responsible for ongoing O&M: South Londonderry Township will work with property owners to develop a mutually agreed upon Operation & Maintenance Agreement to ensure that the implemented BMPs function as designed to minimize the sediment and nutrient loading rates to local surface streams.

Activity involved with O&M for each BMP and the frequency at which O&M activities occur:

Streambank stabilization: Once the streambanks of Spring Creek have been stabilized, regular inspection and maintenance activities will occur as follows:

- Since vegetation establishment is a critical component of the long-term stability of the streambank, monthly inspections should occur for the first year after the project is complete. A minimum 85% plant survival rate should be achieved and documented.
- Weeds and invasive plants threaten the survival of native plants, and should be aggressively controlled by herbicides, mowing, and/or weed mats for the first four years after implementation.
 - Applying herbicides for the first two to three years may be necessary to control weeds. This activity is regulated by the PA Department of Agriculture and proper care should be taken in a streamside setting.
 - Mowing grasses should occur twice each growing season with a mower height set to eight to twelve inches.
 - Weed mats suppress weed growth around newly planted vegetation and should be removed once trees have developed a canopy sufficient to shade out the weeds.
- Once the vegetation has been established, regular maintenance should be minimal.