COMBINED TOTAL MAXIMUM DAILY LOAD & POLLUTANT REDUCTION PLAN

Upper Gwynedd Township
Montgomery County, Pennsylvania

In Compliance with the Pennsylvania Department of Environmental Protection's National Pollutant Discharge Elimination System Phase II MS4 Program Permit No. PAI 130049

Prepared For:
Upper Gwynedd Township
1 Parkside Place
North Wales, PA 19454

Prepared By:
T&M Associates

June 2019
Project No. GWND 00302

Contents

Foreword iii
Section A – Public Participation 1
Section B – Map 2
Section C – Pollutants of Concern 2
Section D – Existing Load for Pollutant(s) of Concern 3
Section E – Wasteload Allocation(s) (WLA(s)) 7
Section F – Analysis of TMDL Objectives 8
Section G – Select BMPs To Achieve the Minimum Required Reductions in Pollutant Load 8
Section H – Identify Funding Mechanisms 9
Section I – Identify Responsible Parties for Operation and Maintenance (O&M) of BMPs 10
Appendix

List of Figures

Figure 1 – Land Cover and Planning Areas ..... Appendix
Figure 2 – Existing Stormwater BMPs and Planning Area ..... Appendix
Figure 3 – Proposed Stormwater BMPs and Planning Area ..... Appendix
Figure 4 – Wissahickon Watershed Model Boundary ..... Appendix
Figure 5 – Skippack Watershed Model Boundary ..... Appendix

List of Tables

Table 1 – PADEP MS4 Requirements for Upper Gwynedd Township ..... Appendix
Table 2 – Skippack Creek Land Uses and Pollutant Loads ..... Appendix
Table 3 – Wissahickon Creek Land Uses and Pollutant Loads ..... Appendix
Table 4 – NLCD vs. MapShed Cell Values ..... Appendix
Table 5 – NLCD Land distribution and sediment loads in the Wissahickon Planning Area ..... Appendix
Table 6 – NLCD Land distribution and sediment loads in the Skippack Planning Area ..... Appendix
Table 7 – BMPs and Sediment Reduction used to Calculate the Baseline Load in the Wissahickon Planning Area ..... Appendix
Table 8 - BMPs and Sediment Reduction used to Calculate the Baseline Load in the Skippack Planning Area ..... Appendix
Table 9 - BMPs and Sediment Reduction Credit used to calculate the Existing Load in the Wissahickon Planning Area ..... Appendix

Table 10 - BMPs and Sediment Reduction Credit used to calculate the Existing Load in the Skippack Planning Area ..... Appendix

Table 11 - BMPs and Sediment Reduction Credit used to meet the WLA in the Wissahickon Planning Area ..... Appendix

Table 12 - BMPs and Sediment Reduction Credit used to achieve the WLA in the Skippack Planning Area ..... Appendix

Foreword

This combined Total Maximum Daily Load (TMDL) Plan and Pollutant Reduction Plan (PRP) serves to fulfill the requirements of "Total Maximum Daily Load For Sediment and Nutrients Wissahickon Creek Watershed" by United States Environmental Protection Agency (USEPA) dated October 10, 2003, "Total Maximum Daily Load for Skippack Creek, Montgomery County, Pennsylvania" by USEPA dated April 8, 2005, "Decision Rationale For the Withdrawal of the Nutrient TMDLs for the Skippack Creek Watershed, Montgomery County, Pennsylvania" by USEPA dated September 26, 2007, and Appendices E and F of NPDES PAI-130049 issued by the Pennsylvania Department of Environmental Protection (PA DEP) to Upper Gwynedd Township effective May 1, 2019.

This plan has been completed in accordance with the TMDL Plan Instructions (3800-PM-BCW0200d) revised 3/2017 using publicly available data, data supplied by Upper Gwynedd Township, and data supplied by Merck & Co., Inc.

While this plan aims to provide guidance towards the construction and implementation of stormwater quality Best Management Practices (BMPs) to provide pollutant loading reductions, it should be noted that this is a fluid document that will be evaluated and updated yearly as specific proposed locations and types of BMPs are analyzed and designed, as new opportunities for partnerships are realized, and as revised regulations and BMPs are developed and implemented.

Some examples of common BMPs are dry extended detention basins, raingardens, infiltration trenches and stream bank restoration.

Section A – Public Participation

PA DEP Requirement: *"The applicant shall make a complete copy of the TMDL Plan available for public review*"

A complete copy of the Combined TMDL Plan and PRP is available for review by the public at the following locations:

- On the Upper Gwynedd Township website at http://www.uppergwynedd.org/township-information/stormwater-management.aspx
- At the Upper Gwynedd Township Administration Building at 1 Parkside Place, North Wales PA 19454

PA DEP Requirement: "*The applicant shall publish, in a newspaper of general circulation in the area, a public notice containing a statement describing the plan, where it may be reviewed by the public, and the length of time the permittee will provide for the receipt of comments. The public notice must be published at least 45 days prior to the deadline for submission of the TMDL Plan to DEP.* ***Attach a copy of the public notice to the TMDL Plan"****.*

The required public notice will be printed in the local newspaper on June 24, 2019. A copy of the public notice and proof of publishing will be attached in the Appendix.

PA DEP Requirement: *"The applicant shall accept written comments for a minimum of 30 days from the date of public notice.* ***Attach a copy of all written comments received from the public to the TMDL Plan****."*

Written comments will be received from June 26 to July 25, 2019. A copy of the written comments received from the public will be attached in the Appendix.

PA DEP Requirement: *"The applicant shall accept comments from any interested member of the public at a public meeting or hearing, which may include a regularly scheduled meeting of the governing body of the municipality or municipal authority that is the permittee."*

Verbal comments will be accepted from the public at the regularly scheduled Township Board of Commissioners meeting on July 22, 2019. A copy of the verbal comments will be attached in the Appendix.

PA DEP Requirement: "*The applicant shall consider and make a record of the consideration of each timely comment received from the public during the public comment period concerning the plan, identifying any changes made to the plan in response to the comment.* ***Attach a copy of the permittee's record of consideration of all timely comment received in the public comment period to the TMDL Plan****."*

All written and verbal public comments will be considered and a written response to each comment will be attached in the Appendix.

Section B – Map

PA DEP Requirement: "*Attach a map that identifies* ***land uses and/or impervious/pervious surfaces*** *and the* ***storm sewershed boundary*** *associated with each MS4 outfall that discharges to TMDL waters and calculate the storm sewershed drainage area. In addition, the map must identify the proposed location(s) of structural BMP(s) that will be implemented to achieve the required pollutant load reductions."*

A map showing the storm sewershed boundaries and current land uses is included in the Appendix as Figure 1. A map showing the storm sewershed boundaries and the location of the existing structural BMPs is provided in the Appendix as Figure 2. A map showing the storm sewershed boundaries and the locations of structural BMPs proposed to meet the minimum required reductions in pollutant loading is provided as Figure 3 in the Appendix.

Section C – Pollutants of Concern

PA DEP Requirement: "*Identify the pollutant(s) of concern for each storm sewershed (see Section I.B of these instructions)."*

Since this Combined TMDL Plan & PRP was developed for TMDL waters, the pollutants are based on the Wasteload Allocations (WLAs) provide in the Wissahickon and Skippack Creek TMDLs which references "siltation" for each of the Township's impaired watercourses. The pollutant of concern for siltation is Total Suspended Solids (TSS).

The PA DEP's MS4 Requirements Table (Table 1 in the Appendix) also lists impairments due to Nutrients and Excessive Algal Growth for the Wissahickon, Skippack, and Towamencin Creeks. These impairments require that PRPs be developed to achieve a 5% Total Phosphorus (TP) reduction. However, per Section 1.B of PADEP's "TMDL Plan Instructions", "*DEP will allow MS4s to calculate loads and pollutant reductions based on sediment, under the assumption that the achievement of TMDL Plan objectives for sediment will also achieve the objectives for TP.*"

Upper Gwynedd Township has elected to use this presumptive approach. Therefore, this combined TMDL Plan and PRP will explicitly show a way to achieve the objectives for sediment and assume that the objectives for TP are implicitly achieved.

Section D – Existing Load for Pollutant(s) of Concern

PA DEP Requirement: *"Calculate or report the existing load, in lbs per year, for the pollutant(s) of concern in the TMDL Planning Area." "TMDL Plans must use: 1) the baseline load established in a TMDL, or 2) a load that is distributed from a bulk existing load for a group of MS4s in a TMDL, or 3) a recalculated load as determined using the MapShed model or equivalent."*

Upper Gwynedd Township has calculated the existing load by using the MapShed model in the Model My Watershed (MMW) application version 1.24.2 and the Model My Watershed BMP Spreadsheet tool version 2018-10-17 at 11:30am ET from the Stroud Water Research Center. The date of the calculations for this combined TMDL Plan & PRP is May 1, 2019.

The existing sediment load from Upper Gwynedd's combined planning area to the Wissahickon Creek is **1,239,355 lbs/yr as of May 1, 2019**.

The existing sediment load from Upper Gwynedd's combined planning area to the Skippack Creek is **1,165,291 lbs/yr as of May 1, 2019**.

The rest of this section provides a summary of the calculation of the existing loads listed above in compliance with PA DEP requirements. Detailed calculations are in the Appendix.

PA DEP Requirement: *"New modeling must utilize the same land use/land cover information that was used to develop the TMDL or other quality assured land use/land cover data from the time of TMDL approval."*

MMW used the National Land Cover Database 2011 (NLCD2011) to derive inputs for the MapShed sediment load calculations. Tables 5 and 6 in the appendix show the NLCD2011 distribution for the planning areas.

PA DEP Requirement: *"If a combined PRP and TMDL Plan is developed (see Section I.F* [of the TMDL Instructions]*), in which PRP and TMDL Planning Areas are combined into one Planning Area, the existing loads for the planning Area may only be derived using a new modeling effort…"*

The combined planning areas assessed in this plan consist of the urbanized area in Upper Gwynedd Township which drains to the TMDL watercourses (the Wissahickon and Skippack Creeks) through the MS4 excluding PennDOT and Montgomery County right-of-way's, and the parcels covered by industrial stormwater NPDES permits PAR120014 (Tuscan Lehigh Dairies) and PAR230048 (Colorcon). MMW was used for the new modeling effort.

PA DEP Requirement: *"MapShed, or any other watershed model where channel erosion is explicitly modeled, should be run on a minimum of 10 mi^2 area to properly account for downstream impacts and include impaired waters identified in the MS4 Requirements Table."*

13 square miles of the Wissahickon watershed was modeled as shown in Figure 4 in the Appendix. 43 square miles of the Skippack watershed was modeled as shown in Figure 5 in the Appendix. The modeled watersheds included all the impaired waters identified in the MS4 Requirements Table for Upper Gwynedd (Table 1 in the Appendix).

PA DEP Requirement: *"Baseline loads in older TMDLs typically did not account for load reductions from urban stormwater BMPs existing at the time of TMDL preparation. In such cases, MS4s may consider structural BMPs installed prior to the TMDL approval date in estimating existing loads."*

The baseline loads from the original Wissahickon and Skippack TMDLs did not account for load reductions from urban stormwater BMPs. Tables 7 and 8 in the Appendix provide the required information for structural stormwater BMPs within the planning areas that existed at the time of the original TMDL preparation. The total annual credit towards the baseline load from the BMPs in the Wissahickon planning area equals **111,940 lbs/year**. The total annual credit towards the baseline load from the BMPs in the Skippack planning area equals **134,315 lbs/year**.

Taking the annual credit for BMPs installed prior to the original Wissahickon TMDL approval into account, the baseline TSS load from the Wissahickon planning area is calculated as:

1,458,468 lbs/yr – 111,940 lbs/yr = **1,346,528 lbs/yr as of October 10, 2003**

Taking the annual credit for BMPs installed prior to the original Skippack TMDL approval into account, the baseline TSS load from the Skippack planning area is calculated as:

1,331,539 lbs/yr – 134,315 lbs/yr = **1,197,224 lbs/yr as of April 8, 2005**

PA DEP Requirement: *"MS4s may also consider the load reductions achieved through structural BMPs installed after the TMDL was approved. After the TMDL approval date, load reductions associated with structural BMPs installed under Chapter 102 NPDES permits may be credited only to the extent that the BMPs produce a net load reduction…"*

Upper Gwynedd has considered load reductions achieved through structural BMPs installed after the original TMDLs were approved. None of the structural BMPs considered were installed to meet the requirements of a Chapter 102 NPDES permit. Tables 9 and 10 in the Appendix provide the required information for structural stormwater BMPs within the planning areas that were installed after the original TMDLs were approved. The total annual credit towards the existing load from the BMPs in the Wissahickon planning area equals **107,173 lbs/year**. The total annual credit towards the baseline load from the BMPs in the Skippack planning area equals **31,933 lbs/year**.

Taking the annual credit for BMPs installed prior to the original Wissahickon TMDL approval into account, the existing TSS load from the Wissahickon planning area is calculated as:

1,346,528 lbs/yr – 107,173 lbs/yr = **1,239,355 lbs/yr as of May 1, 2019**

Taking the annual credit for BMPs installed prior to the original Skippack TMDL approval into account, the existing TSS load from the Skippack planning area is calculated as:

1,197,224 lbs/yr – 31,933 lbs/yr = **1,165,291 lbs/yr as of May 1, 2019**

PA DEP Requirement: *"MS4 may claim credit for constructed structural BMPs as discussed in Section I.D* [of the TMDL Plan Instructions]*, assuming those BMPs continue to be maintained and are functioning as designed. In order to claim credit, identify all such structural BMPs in Section D of the TMDL Plan along with the following information:*

- *A detailed description of the BMP;*
- *Latitude and longitude coordinates for the BMP;*
- *Location of the BMP on the storm sewershed map;*

- *The permit number, if any, that authorized installation of the BMP;*
- *Calculations demonstration the pollutant reductions achieved by the BMP;*
- *The date the BMP was installed and a statement that the BMP continues to serve the function(s) it was designed for; and*
- *The operation and maintenance (O&M) activities of the BMP, O&M frequencies, and the party(ies) who are responsible for O&M."*

As part of the Township's ongoing MS4 program, inspections of the existing stormwater BMPs will be completed by the Township to verify that each BMP listed in Tables 7, 8, 9 and 10 continues to serve the function(s) it was designed for. If it is determined during these inspections that any of the existing BMPs are not functioning properly, maintenance will be performed to correct the problem(s) or this BMP will be removed from the credit calculations and the proposed BMPs and reduction calculations will be revised accordingly.

As part of the Township's ongoing MS4 program, the Township will perform research to determine which existing BMP's were authorized through a permit and the date each BMP was installed. Tables 7, 8, 9, and 10 will then be updated to include these permit numbers and installation dates.

Operation and Maintenance (O&M) for the different types of <u>existing</u> BMPs is as follows:

<u>Dry Basins and Dry Extended Detention Basins</u>

Maintenance is necessary to ensure proper functionality of the extended detention basin and should take place on a quarterly basis. A basin maintenance plan should be developed which includes the following measures:

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation at least four times per year, as well as after every storm greater than 1 inch.
- Structures include basin bottoms, trash racks, outlets structures, riprap or gabion structures, and inlets.
- Sediment removal should be conducted when the basin is completely dry. Sediment should be disposed of properly and once sediment is removed, disturbed areas need to be immediately stabilized and revegetated.
- Mowing and/or trimming of vegetation should be performed as necessary to sustain the system, but all detritus should be removed from the basin.
- Vegetated areas should be inspected annually for erosion.
- Vegetated areas should be inspected annually for unwanted growth of exotic/invasive species.
- Vegetative cover should be maintained at a minimum of 95 percent. If vegetative cover has been reduced by 10%, vegetation should be reestablished.

<u>Surface Infiltration Basin</u>

The following represents the recommended maintenance for surface infiltration basins:

- Catch Basins and Inlets (upgradient of infiltration basin) should be inspected and cleaned at least 2 times per year and after runoff events.
- The vegetation along the surface of the Infiltration basin should be maintained in good condition and any bare spots revegetated as soon as possible.

- Vehicles should not be parked or driven on an Infiltration Basin and care should be taken to avoid excessive compaction by mowers.
- Inspect the basin after runoff events and make sure that runoff drains down within 72 hours. Mosquitoes should not be a problem if the water drains in 72 hours. Mosquitoes require a considerably long breeding period with relatively static water levels.
- Inspect for accumulation of sediment, damage to outlet control structures, erosion control measures, signs of water contamination/spills, and slope stability in the berms.
- Mow only as appropriate for vegetative cover species.
- Remove accumulated sediment from basin as required. Restore original cross section and infiltration rate. Properly dispose of sediment.

Subsurface (Underground) Infiltration Basin

The following represents the recommended maintenance for subsurface infiltration basins:

- All catch basins and inlets should be inspected and cleaned at least 2 times per year.
- The overlying vegetation of subsurface infiltration features should be maintained in good condition and any bare spots revegetated as soon as possible.
- Vehicular access on subsurface infiltration areas should be prohibited and care should be taken to avoid excessive compaction by mowers. If access is needed, use of permeable, turf reinforcement should be considered.

Wet Ponds/Basins

The following represents the recommended maintenance for wet basins:

- During the first growing season or until established, vegetation should be inspected every 2 to 3 weeks.
- Wet Ponds/Basins should be inspected at least 4 times per year and after major storms (greater than 2 inches in 24 hours) or rapid ice breakup. Inspections should access the vegetation, erosion, flow channelization, bank stability, inlet/outlet conditions, embankment, and sediment/debris accumulation.
- The pond drain should be inspected and tested 4 times per year. Problems should be corrected as soon as possible.
- Wet Pond and buffer vegetation may need support (watering, weeding, mulching, replanting, etc.) during the first 3 years. Undesirable species should be carefully removed and desirable replacements planted if necessary.
- Once established, properly designed and installed Wet Ponds should require little maintenance. Vegetation should maintain at least an 85 percent cover of the emergent vegetation zone and buffer area.
- Annual harvesting of vegetation may increase the nutrient removal of Wet Ponds; if performed it should generally be done in the summer so that there is adequate regrowth before winter. Care should be taken to minimize disturbance, especially of bottom sediments, during harvesting. The potential disturbance from harvesting may outweigh its benefits unless the WP receives a particularly high nutrient load or discharges to a nutrient sensitive waterbody.
- Sediment should be removed from the forebay before it occupies 50 percent of the forebay, typically every 5 to 10 years.

Streambank Restoration

The following represents the recommended maintenance for streambank restoration projects:

- During the first growing season or until established, vegetation should be inspected every 2 to 3 weeks.
- Watering of any new vegetation should be as needed during the first growing season to supplement rainfall until established.
- Mulching of seeded areas and new vegetation should be performed as needed during the first growing season until vegetation is established.
- Weed and invasive species control by herbicide, mowing and weed mats should be performed as needed until the native riparian buffer vegetation is established enough to shade and out compete weeds.
- Streambank restorations should be inspected at least 4 times per year and after major storms (greater than 2 inches in 24 hours) or rapid ice breakup. Inspections should access the vegetation, erosion, flow channelization, bank stability, and sediment/debris accumulation.

Riparian Buffer Restoration

The following represents the recommended maintenance for riparian buffer restoration projects:

- During the first growing season or until established, vegetation should be inspected every 2 to 3 weeks.
- Watering of any new vegetation should be as needed during the first growing season to supplement rainfall until established.
- Mulching of seeded areas and new vegetation should be performed as needed during the first growing season until vegetation is established.
- Weed and invasive species control by herbicide, mowing and weed mats should be performed as needed until the native riparian buffer vegetation is established enough to shade and out compete weeds.
- Riparian buffer restorations should be inspected at least 4 times per year and after major storms (greater than 2 inches in 24 hours). Inspections should access the vegetation, erosion, flow channelization, and sediment/debris accumulation.

Section E – Wasteload Allocation(s) (WLA(s))

PA DEP Requirement: *"For TMDLs with specific WLA(s), report the specific WLA(s) established for the MS4(s)."*

The original WLA for Upper Gwynedd in the Wissahickon TMDL is 550,584 lb/yr. The original TMDL required a 28.4 % reduction from the baseline load to meet this WLA. Using the required 28.4% reduction, the revised WLA for Upper Gwynedd in the Wissahickon watershed based on the new modeling effort is **964,114 lb/yr**.

$$New\ Baseline * (1 - Required\ Reduction\ from\ Original\ TMDL) = WLA$$
$$1{,}346{,}528\frac{lb}{yr} * (1 - 0.284) = 964{,}114\frac{lb}{yr}$$

The original WLA for Upper Gwynedd in the Skippack TMDL is 4,364,075 lb/yr. The original TMDL required a 18% reduction from the baseline load to meet this WLA. Using the required 18%

reduction, the revised WLA for Upper Gwynedd in the Skippack watershed based on the new modeling effort is **<u>981,724 lb/yr</u>**.

$$New\ Baseline * (1 - Required\ Reduction\ from\ Original\ TMDL) = WLA$$
$$1{,}197{,}224\frac{lb}{yr} * (1 - 0.18) = 981{,}724\frac{lb}{yr}$$

Section F – Analysis of TMDL Objectives

PA DEP Requirement: *"In this section of the Plan, MS4s must present the following:*

1. *<u>Long-Term Reduction</u> – The pollutant load reduction required to meet the WLA(s), in lb/yr, and percentage of existing load.*

2. *<u>Short-Term Reduction</u> – The MS4's decision on which objective will be pursued for the subsequent permit term, i.e., either 1) achieve the WLA(s) or 2) reduce existing load by 10% (sediment) or 5% (TP) as well as the pollutant load reduction, in lbs/yr."*

    1. Upper Gwynedd's long-term objective is to reduce the cumulative existing TSS pollutant load to the Wissahickon and Skippack Creeks by 458,988 lb/yr, approximately 19% of the 2,404,647 lb/yr existing load. Specifically, Upper Gwynedd will reduce 275,310 lb/yr; approximately 22% of the 1,239,356 lb/yr existing load in the Wissahickon watershed, and 183,678 lb/yr, approximately 16% of the 1,165,291 lb/yr existing load in the Skippack watershed to achieve the new WLAs.

    2. Upper Gwynedd's short-term objective is to reduce the cumulative existing TSS pollutant load to the Wissahickon and Skippack Creeks by 248,883 lb/yr, approximately 10% of the 2,404,647 lb/yr existing load in the subsequent permit term. Specifically, Upper Gwynedd will reduce 204,125 lb/yr, approximately 17% of the 1,239,356 lb/yr existing load in the Wissahickon watershed, and 44,758 lb/yr, approximately 4% of the 1,165,291 lb/yr existing load in the Skippack watershed.

Section G – Select BMPs To Achieve the Minimum Required Reductions in Pollutant Load

PA DEP Requirement: *"This section must be divided into two parts if the MS4 determines it will be unable to achieve the WLA(s) in the subsequent permit term: 1) short-term reductions for the permit term, and 2) long-term reductions to meet the WLA(s).*

<u>Short-Term Reductions for the Permit Term</u>

Specific BMP(s), their location(s) and estimate date(s) of implementation must be identified along with calculations demonstrating that the TMDL objective will be achieved.

<u>Long-Term Reductions to Meet the WLA(s)</u>

In this section of the TMDL Plan (where applicable), the MS4 must present, at a minimum, a conceptual plan for how the WLA(s) will be achieved, long term. An estimate on the number of years it will take the MS4 to achieve the WLA(s) should be reported based on the preliminary analysis."

Short-Term Reductions for the Permit Term

Tables 11 and 12 in the Appendix lists the BMPs proposed to meet the reduction for the 2019-2024 permit term. Their locations are shown on Figure 3 attached in the Appendix. The proposed BMPs are as follows:

1. Streambank Restoration – 204,125 lb/yr
   a. This consists of a streambank restoration project on the Wissahickon Creek proposed by the Wissahickon Valley Watershed Association using natural stream channel design to create long-term stability of the streambed, streambanks and floodplain.
2. Retrofitting existing Dry Detention Basins into Dry Extended Detention Basins – 44,758 lb/yr
   a. This consists of converting existing dry detention basins in the Skippack Watershed planning area into dry extended detention basins. This will increase the BMP effectiveness from 10% to 60%. If it is determined during the design process that retrofitting a particular basin is not feasible, the PRP will be updated accordingly to achieve the minimum required TSS reduction.

Long-Term Reductions to Meet the WLA(s)

1. Streambank Restoration – 209,925 lb/yr
   a. This consists of a streambank restoration project on the Wissahickon and Skippack Creeks using natural stream channel design to create long-term stability of the streambed, streambanks and floodplain.

The WLAs are estimated to be achieved in 10 years based on reducing the existing load by 10% per 5-year permit term.

Section H – Identify Funding Mechanisms

PA DEP Requirement: *"Applicants must identify project sponsors and partners and probable funding sources for each BMP."*

Project sponsors and partners include Upper Gwynedd Township, Merck & Co., Inc, the Wissahickon Valley Watershed Association, and the Perkiomen Watershed Conservancy. The proposed BMPs will be funded by the project sponsors, partners, and through grant and financing programs available at the time of each project. The following is a list of current funding sources for the types of BMPs currently proposed.

Pennsylvania Infrastructure Investment Authority (PENNVEST) and Pennsylvania Department of Environmental Protection | Green Initiatives

PENNVEST actively funds green initiatives that promote and encourage environmental responsibility and enhance water quality. Solutions include riparian buffers, rain gardens, and floodplain and wetland restorations.

URL: http://www.pennvest.pa.gov/Information/Funding-Programs/Pages/default.aspx
Contact: Brion Johnson | bjohnson@pa.gov | 717-783-6798 or Steven Anspach | sanspach@pa.gov | 717-783-6589

Department of Community & Economic Development | Commonwealth Financing Authority (CFA)

The DCED-CFA was established as an independent agency of the Commonwealth to administer Pennsylvania's economic stimulus packages. DCED-CFA holds fiduciary responsibility over a variety of funding sources some of which provide funding for stormwater and stormwater-related projects, including:

- Watershed Restoration and Protection Program (riparian buffers, stream restorations, water quality basins, floodplain restoration)
- Greenways, Trails and Recreation Program (installation of green infrastructure at parks)
- Local Share Account programs

URL: http://dced.pa.gov/programs-funding/
Contact: http://dced.pa.gov/download/regional-contact-information/?wpdmdl=61870

Department of Conservation and Natural Resources | Community Conservation Partnerships Program (C2P2)

DCNR grants can be used for green/sustainable park, riparian buffers, and implementing recommendations of Rivers Conservation Plans.
URL: http://www.dcnr.state.pa.us/brc/grants/
Contact: http://www.dcnr.state.pa.us/brc/aboutus/index.htm?tab=RegionalOffices#RegionalOffices

Department of Environmental Protection | Growing Greener Watershed Protection Grants

Funding for protection and restoration of Pennsylvania's water resources, including stream restorations and installation of stormwater BMPs in urban areas.
URL: http://www.dep.pa.gov/Citizens/GrantsLoansRebates/Growing-Greener/Pages/default.aspx
Contact: DEP Grants Center | GrowingGreener@pa.gov | 717-705-5400

Department of Transportation | Transportation Alternatives – Set Aside Grants

Funds stormwater projects that decrease the negative impact of stormwater runoff from roads, including detention and sediment basins and stream channel stabilization.
URL: https://spportal.dot.pa.gov/Planning/AppReg/TAP/Pages/default.aspx
Contact: Chris Metka | CMetka@pa.gov | 717-787-8065

Section I – Identify Responsible Parties for Operation and Maintenance (O&M) of BMPs

PA DEP Requirement: "*Applicants must identify the following for each selected BMP:*

- *The anticipated party(ies) responsible for ongoing O&M;*
- *The activities involved with O&M for each BMP; and*
- *The frequency at which O&M activities will occur."*

The following parties will be responsible for O & M of the new BMP's once they are implemented:

1. The Township will be responsible for the O & M associated with streambank restoration projects they implement in the Skippack watershed.
2. The WVWA will be responsible for the O & M associated with streambank restoration projects they implement in the Wissahickon watershed.
3. O & M for the basin retrofits will be determined on a case-by-case basis depending on the existing or proposed O & M agreements attached to the existing basins. It should be noted that even if the property owner or Homeowner's Association (HOA) is responsible for O & M of the basin, the Township will ultimately have the responsibility should the property owner/HOA neglect to maintain the BMP so that it functions as designed.

O&M activities for the proposed/new BMPs are as follows:

Dry Extend Detention Basins

Maintenance is necessary to ensure proper functionality of the extended detention basin and should take place on a quarterly basis. A basin maintenance plan should be developed which includes the following measures:

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation at least four times per year, as well as after every storm greater than 1 inch.
- Structures include basin bottoms, trash racks, outlets structures, riprap or gabion structures, and inlets.
- Sediment removal should be conducted when the basin is completely dry. Sediment should be disposed of properly and once sediment is removed, disturbed areas need to be immediately stabilized and revegetated.
- Mowing and/or trimming of vegetation should be performed as necessary to sustain the system, but all detritus should be removed from the basin.
- Vegetated areas should be inspected annually for erosion.
- Vegetated areas should be inspected annually for unwanted growth of exotic/invasive species.
- Vegetative cover should be maintained at a minimum of 95 percent. If vegetative cover has been reduced by 10%, vegetation should be reestablished.

Streambank Restoration

The following represents the recommended maintenance for streambank restoration projects:

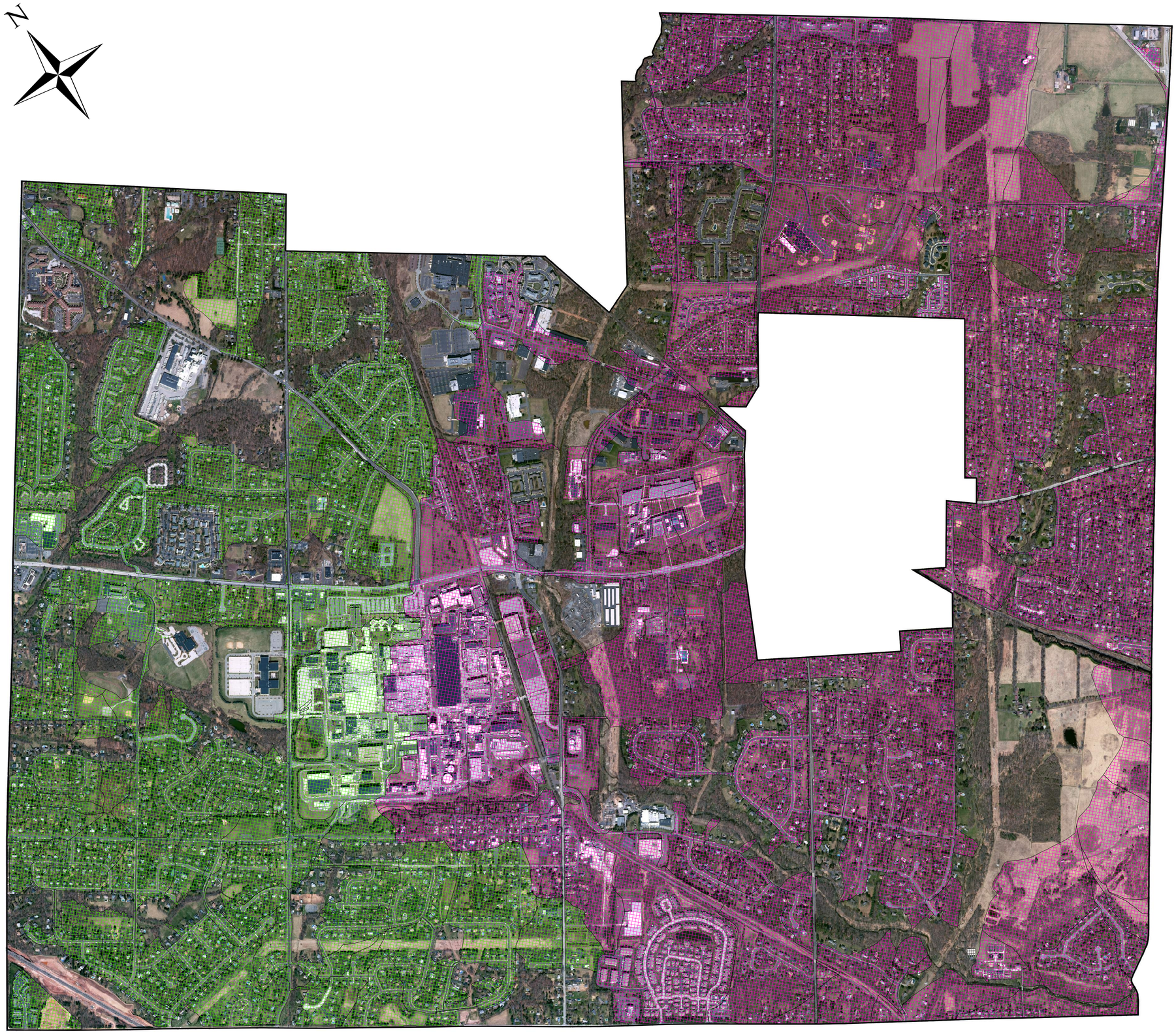
- During the first growing season or until established, vegetation should be inspected every 2 to 3 weeks.
- Watering of any new vegetation should be as needed during the first growing season to supplement rainfall until established.
- Mulching of seeded areas and new vegetation should be performed as needed during the first growing season until vegetation is established.
- Weed and invasive species control by herbicide, mowing and weed mats should be performed as needed until the native riparian buffer vegetation is established enough to shade and out compete weeds.
- Streambank restorations should be inspected at least 4 times per year and after major storms (greater than 2 inches in 24 hours) or rapid ice breakup. Inspections should access the vegetation, erosion, flow channelization, bank stability, and sediment/debris accumulation.

APPENDIX

COMBINED TOTAL MAXIMUM DAILY LOAD & POLLUTANT REDUCTION PLAN

Upper Gwynedd Township, Montgomery County, Pennsylvania

Figure 1. Storm Sewershed Boundary Map



Legend

- Wissahickon Storm Sewershed
- Skippack Storm Sewershed

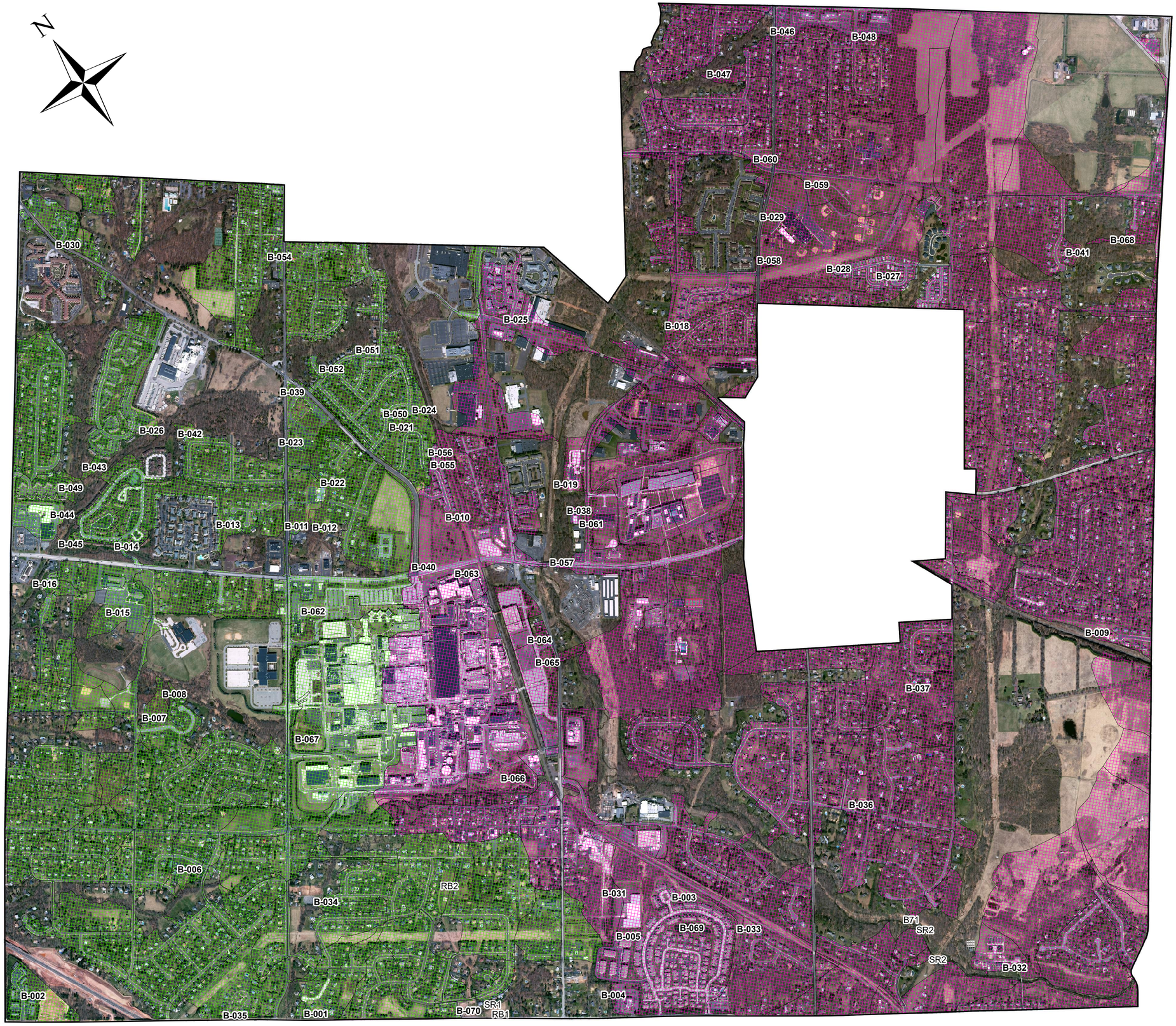
0 0.10.2 0.4 0.6 0.8 Miles

Date: 6/6/2019

COMBINED TOTAL MAXIMUM DAILY LOAD & POLLUTANT REDUCTION PLAN

Upper Gwynedd Township, Montgomery County, Pennsylvania

Figure 2. Existing Structural BMPs



Legend

Wissahickon Storm Sewershed

Skippack Storm Sewershed

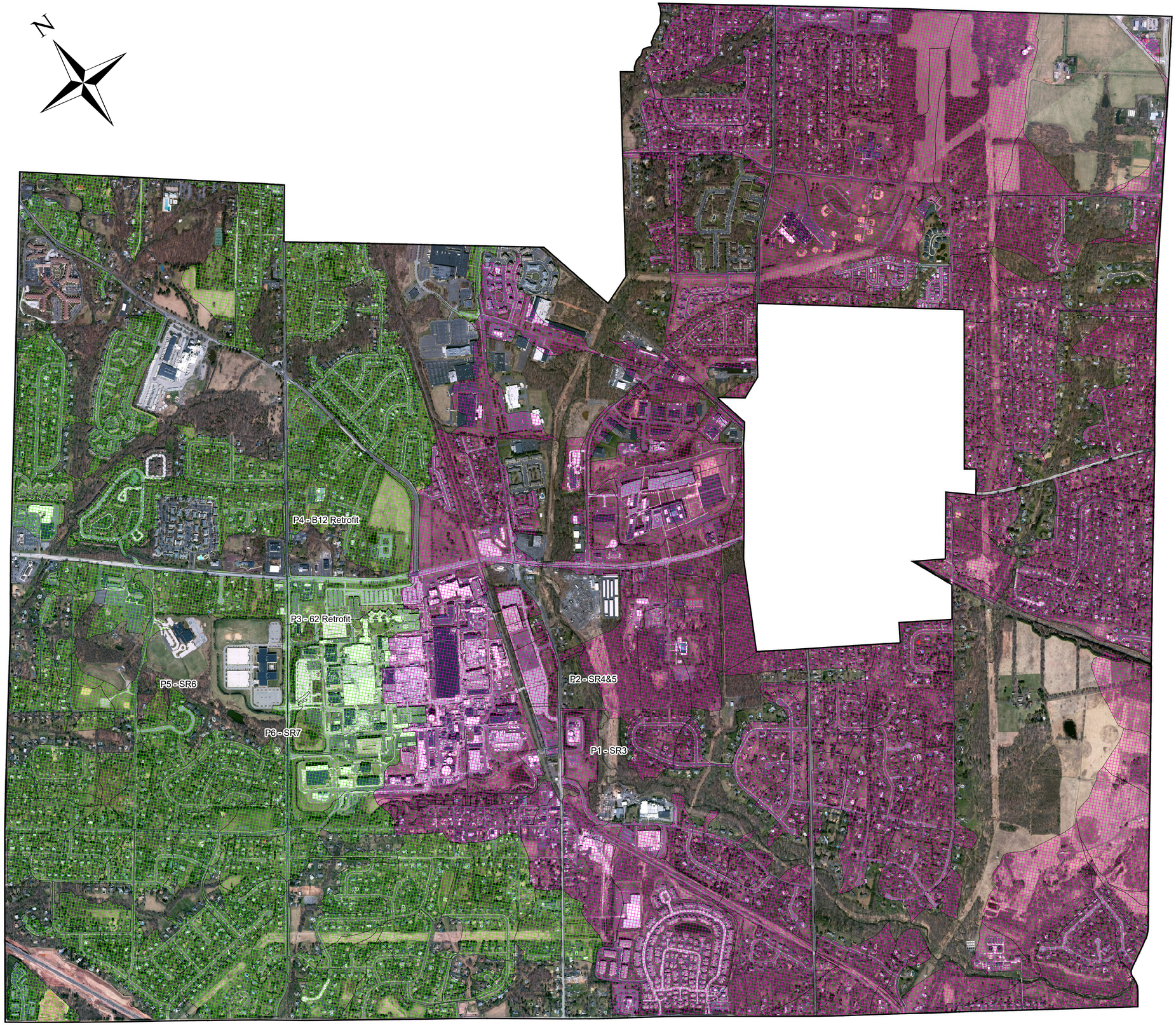
0 0.10.2 0.4 0.6 0.8 Miles

Date: 6/6/2019

COMBINED TOTAL MAXIMUM DAILY LOAD & POLLUTANT REDUCTION PLAN

Upper Gwynedd Township, Montgomery County, Pennsylvania

Figure 3. Proposed Structural BMPs



Legend

Wissahickon Storm Sewershed

Skippack Storm Sewershed

0 0.10.2 0.4 0.6 0.8 Miles

Date: 6/6/2019

Table 1. PADEP MS4 Requirements for Upper Gwynedd Township

MS4 Name	NPDES ID	Individual Permit Required?	Reason	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment
Montgomery County						
UPPER GWYNEDD TWP	PAG130031	Yes	TMDL Plan	Zacharias Creek	Appendix B-Pathogens (5)	Flow Alterations (4c)
				Wissahickon TMDL	TMDL Plan-Siltation, Suspended Solids (4a)	Cause Unknown (4a)
				Wissahickon Creek	Appendix E-Nutrients (4a), Appendix B-Pathogens (5)	Other Habitat Alterations, Water/Flow Variability (4c)
				Towamencin Creek	Appendix E-Excessive Algal Growth (5)	Water/Flow Variability (4c)
				Skippack Creek Watershed TMDL	TMDL Plan-Siltation (4a)	
				Skippack Creek	Appendix E-Excessive Algal Growth, Nutrients (5)	

Detailed Upper Gwynedd TMDL Calculations

First, MMW was used to calculate the average annual sediment loads generated from land cover types within the modeled portions of the Wissahickon and Skippack watersheds to which Upper Gwynedd discharges. The watersheds were delineated by MMW to user defined points on the stream based on the Delaware River Basin High Resolution Stream Network. Figure 4 shows the 13 square mile watershed modeled for the Wissahickon Creek TMDL. Figure 5 shows the 43 square mile watershed modeled for the Skippack Creek TMDL. MMW uses the GWLF-E (MapShed) model to simulate the average annual sediment loads generated in each watershed. The average annual sediment loads are distributed among the land cover types in each watershed as defined by the NLCD2011. The land cover distributions and the results of the simulations are given in tables 2 & 3.

Then, the MMW BMP Spreadsheet tool was used to calculate the baseline, existing and proposed sediment loads discharged to the Wissahickon and Skippack creeks by Upper Gwynedd's MS4 planning areas. The average annual sediment load results and land cover distributions from the modeled watersheds in MMW were used as inputs within the "MMW Output" worksheet of the MMW BMP Spreadsheet Tool. The spreadsheet tool translates the NLCD2011 land cover types into GWLF-E (MapShed) land cover types, and calculates the sediment loading rate in pounds per acre per year (lb/ac/yr) for each of the GWLF-E land cover types. Table 4 shows the key for the translation of NLCD2011 land cover types to MapShed land cover types. Next the NLCD2011 land cover distribution was determined for Upper Gwynedd's planning areas in the Wissahickon and Skippack watersheds and used as input within the "MMW Output" worksheet.

The spreadsheet tool translates the planning area land cover types into GWLF-E land cover types and applies the average annual sediment loading rates for the GWLF-E land cover types from the watersheds modeled in MMW to determine the basis of the baseline loads being discharged from the planning areas. Tables 5 & 6 show the NLCD2011 land cover distributions in the Wissahickon and Skippack Creek planning areas and the loads generated by the planning areas.

$$Sediment\ Load\ from\ Wissahickon\ Planning\ Area = 1{,}458{,}468\,\frac{lb}{yr}$$

$$Sediment\ Load\ from\ Skippack\ Planning\ Area = 1{,}331{,}539\,\frac{lb}{yr}$$

To determine the baseline loads from the planning areas, any BMPs that were installed before the date of the establishment of the TMDL by USEPA were credited against the average annual sediment load based on the land cover types in the planning areas alone. Tables 7 & 8 show the BMPs and sediment reduction credit used calculate the baseline loads.

$$Baseline\ Sediment\ Reductions\ from\ BMPs\ in\ Wissahickon = 111{,}940\,\frac{lb}{yr}$$

$$Baseline\ Sediment\ Reductions\ from\ BMPs\ in\ Skippack = 134{,}315\,\frac{lb}{yr}$$

The baseline load being discharged by Upper Gwynedd at the time of the establishment of the TMDLs by USEPA is:

$$Baseline\ Load\ in\ Wissahickon = 1{,}458{,}468\,\frac{lb}{yr} - 111{,}940\,\frac{lb}{yr} = 1{,}346{,}528\,\frac{lb}{yr}$$

$$Baseline\ Load\ in\ Skippack = 1{,}331{,}539\,\frac{lb}{yr} - 134{,}315\,\frac{lb}{yr} = 1{,}197{,}224\,\frac{lb}{yr}$$

Once the baseline loads were established, the WLA (the amount of sediment permitted to be discharged) to Upper Gwynedd in both TMDL watersheds could be calculated. Per PADEP

TMDL plan instructions section I.D (first note on page 4 of the instructions), “MS4s that calculate existing load(s) through a new modeling effort will need to plan for the same percent reduction in pollutant loads as prescribed by the TMDL.” The percent reductions from the Wissahickon and Skippack TMDLs are 28.4% and 18% respectively. Consequently, the WLAs for Upper Gwynedd in the Wissahickon and Skippack watersheds are:

$$Upper\ Gwynedd\ Wissahickon\ Sediment\ WLA = 1{,}346{,}528\frac{lb}{yr} * (1 - 0.284) = 964{,}114\frac{lb}{yr}$$

$$Upper\ Gwynedd\ Skippack\ Sediment\ WLA = 1{,}458{,}468\frac{lb}{yr} * (1 - 0.18) = 981{,}724\frac{lb}{yr}$$

Next the existing load being discharged by Upper Gwynedd as of May 1, 2019 to both watersheds was determined by crediting qualifying BMPs installed since the establishment of the TMDLs by USEPA against the baseline load. Tables 9 & 10 show the BMPs and sediment reduction credit used calculate the existing loads.

$$Existing\ Sediment\ Reductions\ from\ BMPs\ in\ Wissahickon = 107{,}173\frac{lb}{yr}$$

$$Existing\ Sediment\ Reductions\ from\ BMPs\ in\ Skippack = 31{,}933\frac{lb}{yr}$$

The existing load being discharged by Upper Gwynedd as of May 1, 2019 is:

$$Existing\ Load\ in\ Wissahickon = 1{,}346{,}528\frac{lb}{yr} - 107{,}173\frac{lb}{yr} = 1{,}239{,}355\frac{lb}{yr}$$

$$Existing\ Load\ in\ Skippack = 1{,}197{,}224\frac{lb}{yr} - 31{,}933\frac{lb}{yr} = 1{,}165{,}291\frac{lb}{yr}$$

Finally, Upper Gwynedd determined that it was not feasible to achieve the WLAs in this permit term. Alternatively, a cumulative 10% reduction in sediment load between both watersheds is proposed for the 2019-2024 permit term with similar reductions proposed in

subsequent permit terms until the WLAs are achieved. Tables 11 & 12 show the BMPs, sediment reduction credit, and schedule proposed to meet the WLAs.

$$Sediment\ Reduction\ Proposed\ in\ Wissahickon = 204{,}125\,\frac{lb}{yr}$$

$$Sediment\ Reduction\ Proposed\ in\ Skippack = 44{,}758\,\frac{lb}{yr}$$

$$Total\ Proposed\ Reductions = 248{,}883\,\frac{lb}{yr}$$

$$Required\ 10\%\ Reduction = 10\% * 2{,}404{,}646\,\frac{lb}{yr} = 240{,}465\,\frac{lb}{yr}$$

Selected Area 13 mi²

Streams Land Soil Terrain Climate Pt Sources Animals Water Qual

Stream Network Statistics

Related Layer: Continental US Medium Resolution Stream Network

Turn off

Source: NHDplusV2

Stream Order	Total Length (mi)	Mean Channel Slope (%)
1st	10.02	0.75%
2nd	2.01	0.25%
3rd	0.00	No Data
4th	0.00	No Data
5th	0.00	No Data
6th	0.00	No Data
7th	0.00	No Data
8th	0.00	No Data
9th	0.00	No Data
10th	0.00	No Data
Other	0.00	No Data
Combined	**12.03**	**1.08%**

Length in agricultural areas = 0.04 mi

Length in non-agricultural areas = 11.98 mi

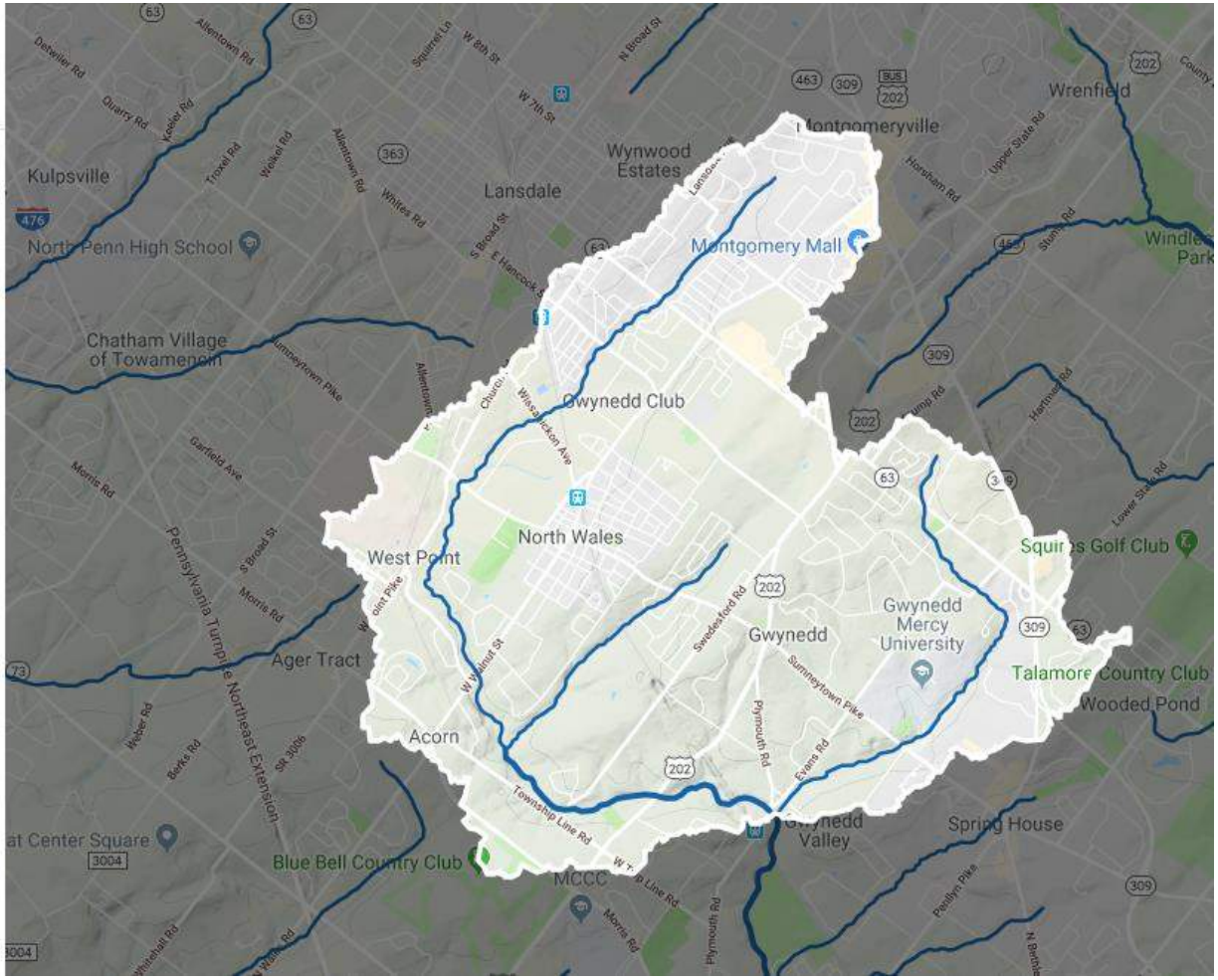


Figure 4. 13 Square Mile Wissahickon Watershed Model Boundary

Selected Area 43 mi²

Streams Land Soil Terrain Climate Pt Sources Animals Water Qual

Stream Network Statistics

Related Layer: Continental US Medium Resolution Stream Network ✖

Turn off

Source: NHDplusV2

Stream Order	Total Length (mi)	Mean Channel Slope (%)
1st	29.55	1.15%
2nd	10.92	0.45%
3rd	3.73	0.16%
4th	0.00	No Data
5th	0.00	No Data
6th	0.00	No Data
7th	0.00	No Data
8th	0.00	No Data
9th	0.00	No Data
10th	0.00	No Data
Other	0.00	No Data
Combined	**44.20**	**1.44%**

Length in agricultural areas = 6.12 mi

Length in non-agricultural areas = 38.08 mi

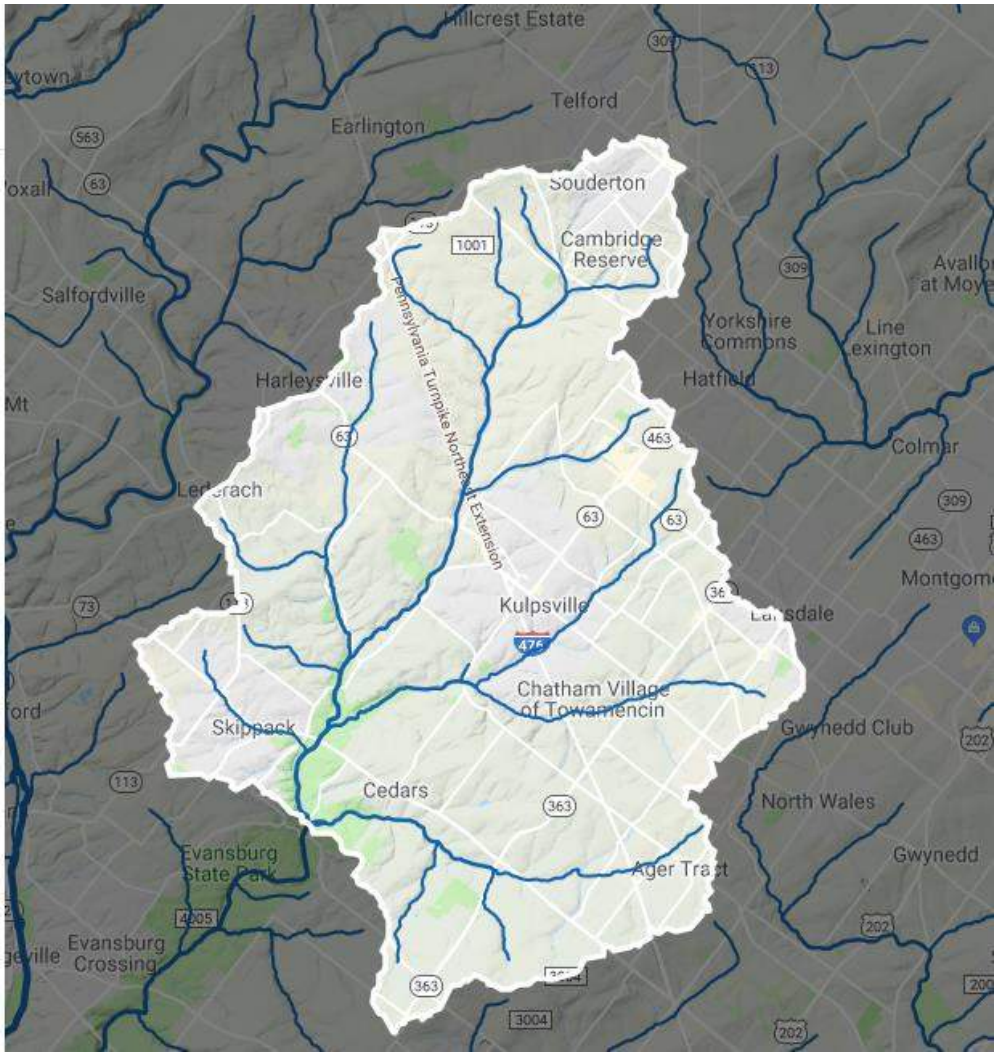


Figure 5. 43 Square Mile Skippack Watershed Model Boundary

Table 2. Skippack Creek Land Uses and Pollutant Loads

Look-Up Table for MMW Loading Rates
Watershed: Skippack Creek
Year: 2011
Source File: UG Skippack Landcover and WQ

Section 2: Landcover Loading Rates Look-Up Table

	TOTAL WATERSHED ANNUAL LOADS					ANNUAL LAND USE LOADING RATES (lbs/acre)		
						SEDIMENT		
	Source	**Area**	**Sediment**	**Total Nitrogen**	**Total Phosphorus**	From Land Use	From Stream Banks ①	**TOTAL SEDIMENT LOADING RATE**
	Units	*Acres*	*Tons*	*Pounds*	*Pounds*	lbs/acre	lbs/acre	lbs/acre
	Source	*area_ac*	*sediment_tons*	*TN_lbs*	*TP_lbs*	*Colum TSS_LoadRateLa*	*TSS_LoadRateBar*	*TSS_LoadRate_lbPerAcPerY*
MapShed Land Use Categories	Hay/Past	5,740.74	452.47	6,637.05	2,750.96	157.64	651.69	**809.32**
	Cropland	1,654.32	1,273.14	12,701.90	3,923.36	1,539.18	651.69	**2,190.86**
	Forest	4,200.00	4.15	497.45	35.06	1.97	651.69	**653.66**
	Wetland	204.94	0.24	70.34	4.19	2.33	651.69	**654.01**
	Disturbed	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
	Turfgrass	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
	Open_Land	286.42	6.79	290.84	21.61	47.40	651.69	**699.08**
	Bare_Rock	27.16	0.02	14.33	0.44	1.14	651.69	**652.82**
	Sandy_Areas	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
	Unpaved_Road	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
	Ld_Mixed	12,629.63	80.38	4,029.86	432.62	12.73	917.39	**930.12**
	Md_Mixed	1,809.88	59.05	2,424.62	248.28	65.26	1,572.79	**1,638.05**
	Hd_Mixed	562.96	18.40	755.43	77.40	65.36	2,192.77	**2,258.13**
	Ld_Residential	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
	Md_Residential	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
	Hd_Residential	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**

	Source	**Sediment**	**Total Nitrogen**	**Total Phosphorus**
Addt'l Sources	*Units*	*Tons*	*Pounds*	*Pounds*
	Farm Animals	0.00	3,842.65	1,015.84
	Tile Drainage	0.00	0.00	0.00
	Stream Bank ①	11,780.80	16,735.95	7,212.56
	Groundwater	0.00	94,256.25	1,714.61
	Point Source	0.00	159,497.79	13,322.17
	Septic Systems	0.00	5,678.54	0.00

Notes:

① - Separate worksheets are used to calculate and apportion the loading rates from the Stream Bank source loads (for sediment, total nitrogen, and total phosphorus) from the MMW Output file into each land use category, using methodology provided by Dr. Barry Evans (Pennsylvania State University), the author of MapShed, and with concurrence from Mr. Bill Brown (PADEP).

② - A separate worksheet is used to calculate and apportion the "Total Nitrogen" and "Total Phosphorus" loading rates from the Farm Animals source load from the MMW Output file into the two agricultural land uses, Hay/Pasture and Cropland, based on area weighting. The methodology was provided by Dr. Barry Evans (Pennsylvania State University), the author of MapShed, and with concurrence from Mr. Bill Brown (PADEP). Additionally, since the Farm Animals source loads do not apply to other land use catergories, the values in those cells are "n/a".

Groundwater	0.0	94,256.3	1,714.6
Point Source	0.0	159,497.8	13,322.2
Septic Systems	0.0	5,678.5	0.0

Table 3. Wissahickon Creek Land Uses and Pollutant Loads

Look-Up Table for MMW Loading Rates
Watershed: Wissahickon Creek
Year: 2011
Source File: UG Wiss Landcover and WQ

Section 2: Landcover Loading Rates Look-Up Table

TOTAL WATERSHED ANNUAL LOADS | **ANNUAL LAND USE LOADING RATES (lbs/acre)**

	Source	Area	Sediment	Total Nitrogen	Total Phosphorus		SEDIMENT From Land Use	SEDIMENT From Stream Banks ①	TOTAL SEDIMENT LOADING RATE	
	Units	*Acres*	*Tons*	*Pounds*	*Pounds*		lbs/acre	lbs/acre	lbs/acre	
	Source	*area_ac*	*sediment_tons*	*TN_lbs*	*TP_lbs*	*Colum*	*TSS_LoadRateLa*	*TSS_LoadRateBa*	*TSS_LoadRate_lbPerAc*	*Colum*
MapShed Land Use Categories	Hay/Past	256.79	28.94	431.30	177.28		225.43	375.55	**600.98**	
	Cropland	197.53	215.68	1,983.18	616.08		2,183.73	375.55	**2,559.28**	
	Forest	1,879.01	2.44	286.87	20.07		2.60	375.55	**378.15**	
	Wetland	81.48	0.13	28.22	1.76		3.14	375.55	**378.69**	
	Disturbed	0.00	0.00	0.00	0.00		0.00	0.00	**0.00**	
	Turfgrass	0.00	0.00	0.00	0.00		0.00	0.00	**0.00**	
	Open_Land	14.81	0.38	14.77	1.10		51.30	375.55	**426.85**	
	Bare_Rock	0.00	0.00	0.66	0.00		0.00	0.00	**0.00**	
	Sandy_Areas	0.00	0.00	0.00	0.00		0.00	0.00	**0.00**	
	Unpaved_Road	0.00	0.00	0.00	0.00		0.00	0.00	**0.00**	
	Ld_Mixed	4,424.69	27.59	1,352.55	145.53		12.47	485.61	**498.08**	
	Md_Mixed	804.94	25.68	1,095.44	112.46		63.80	757.09	**820.89**	
	Hd_Mixed	320.99	10.26	437.69	44.98		63.91	1,013.89	**1,077.81**	
	Ld_Residential	0.00	0.00	0.00	0.00		0.00	0.00	**0.00**	
	Md_Residential	0.00	0.00	0.00	0.00		0.00	0.00	**0.00**	
	Hd_Residential	0.00	0.00	0.00	0.00		0.00	0.00	**0.00**	

Tons * 2000 lbs/ton
acres of a land use

Sum of previous
two sources

	Source	Sediment	Total Nitrogen	Total Phosphorus
Addt'l Sources	*Units*	*Tons*	*Pounds*	*Pounds*
	Farm Animals	0.00	1,117.05	295.69
	Tile Drainage	0.00	0.00	0.00
	Stream Bank ①	1,997.99	2,659.23	1,153.22
	Groundwater	0.00	12,413.71	401.75
	Point Source	0.00	1,217.82	22,994.62
	Septic Systems	0.00	2,524.95	0.00

Notes:
① - Separate worksheets are used to calculate and apportion the loading rates from the Stream Bank source loads (for sediment, total nitrogen, and total phosphorus) from the MMW Output file into each land use category, using methodology provided by Dr. Barry Evans (Pennsylvania State University), the author of MapShed, and with concurrence from Mr. Bill Brown (PADEP).
② - A separate worksheet is used to calculate and apportion the "Total Nitrogen" and "Total Phosphorus" loading rates from the Farm Animals source load from the MMW Output file into the two agricultural land uses, Hay/Pasture and Cropland, based on area weighting. The methodology was provided by Dr. Barry Evans (Pennsylvania State University), the author of MapShed, and with concurrence from Mr. Bill Brown (PADEP). Additionally, since the Farm Animals source loads do not

Groundwater	0.0	12,413.7	401.8
Point Source	0.0	1,217.8	22,994.6
Septic Systems	0.0	2,524.9	0.0

Table 4. **NLCD vs. MapShed Cell Values**

NLCD Code	MapShed
11	1 (Water)
12	22 (Bare Rock)
21	2 (Low Density Mixed Urban)
22	2 (Low Density Mixed Urban)
23	20 (Med Density Mixed Urban)
24	3 (High Density Mixed Urban)
31	22 (Bare Rock)
41	7 (Coniferous Woodlands)
42	8 (Deciduous Woodlands)
43	9 (Mixed Woodlands)
51	NA – Alaska only
52	9 (Mixed Woodlands0
71	21 (Open Land)
72	NA – Alaska only
73	NA – Alaska only
74	NA – Alaska only
81	4 (Hay/Pasture)
82	5 (Cropland)
90	10 (Wetland)
95	11 (Wetland)

Table 5. NLCD Land use distribution and Sediment loads in the Wissahickon Planning Area

TYPE	NLCD Code	AREA (acres)	Sediment (lb/yr)
Open Water	11	-	
Perennial Ice/Snow	12	-	
Developed, Open Space	21	792.68	394,816.31
Developed, Low Intensity	22	397.42	197,947.13
Developed, Medium Intensity	23	241.77	198,468.08
Developed, High Intensity	24	166.53	179,485.19
Barren Land (Rock/Sand/Clay)	31	1.11	0.00
Deciduous Forest	41	387.46	146,516.05
Evergreen Forest	42	2.44	924.31
Mixed Forest	43	11.36	4,295.96
Shrub/Scrub	52	51.44	19,452.58
Grassland/Herbaceous	71	1.11	420.14
Pasture/Hay	81	100.62	60,467.65
Cultivated Crops	82	99.51	254,663.26
Woody Wetlands	90	2.67	1,011.32
Emergent Herbaceous Wetlands	95	-	0.00
Totals		*2,256.11*	*1,458,467.96*

Table 6. NLCD Land use distribution and Sediment loads in the Skippack Planning Area

TYPE	NLCD Code	AREA (acres)	Sediment (lb/yr)
Open Water	11	-	
Perennial Ice/Snow	12	-	
Developed, Open Spac	21	528.36	491,437.65
Developed, Low Intens	22	421.41	391,957.53
Developed, Medium Int	23	128.37	210,283.32
Developed, High Intens	24	70.78	159,832.58
Barren Land (Rock/Sar	31	-	0.00
Deciduous Forest	41	41.87	27,369.06
Evergreen Forest	42	2.44	1,597.73
Mixed Forest	43	1.11	726.23
Shrub/Scrub	52	15.25	9,969.61
Grassland/Herbaceous	71	13.79	9,016.01
Pasture/Hay	81	36.25	29,336.37
Cultivated Crops	82	-	0.00
Woody Wetlands	90	0.02	13.27
Emergent Herbaceous	95	-	0.00
Totals		*1,259.66*	*1,331,539.35*

Table 7. BMPs and Sediment Reduction used to Calculate the Baseline Load in the Wissahickon Planning Area

Project Name	BMP Name	BMP Type	Baseline, Existing, or Proposed	Year Installed	MapShed Land Cover of Drainage Area	Drainage Area (ac)	TSS Load (lbs/yr)	TSS Reduction (%)	TSS Reduction (lbs/yr)
Behind 383 Primrose Dr	B3	Dry Detention	Baseline	Before 2005	Cropland	1.48	3,777.74	10.0%	377.77
Behind 383 Primrose Dr	B3	Dry Detention	Baseline	Before 2005	Hd_Mixed	4.08	4,394.95	10.0%	439.49
Behind 383 Primrose Dr	B3	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.68	1,335.05	10.0%	133.51
Behind 383 Primrose Dr	B3	Dry Detention	Baseline	Before 2005	Md_Mixed	4.48	3,678.54	10.0%	367.85
Behind 383 Primrose Dr	B3	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.13	1,061.52	10.0%	106.15
Access from 375 Morris Rd	B4	Dry Detention	Baseline	Before 2005	Forest	0.28	105.69	10.0%	10.57
Access from 375 Morris Rd	B4	Dry Detention	Baseline	Before 2005	Hd_Mixed	0.46	494.55	10.0%	49.45
Access from 375 Morris Rd	B4	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.42	709.76	10.0%	70.98
Access from 375 Morris Rd	B4	Dry Detention	Baseline	Before 2005	Md_Mixed	1.13	930.86	10.0%	93.09
Access from 375 Morris Rd	B4	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.17	86.31	10.0%	8.63
Behind 425 Primrose Dr	B5	Dry Detention	Baseline	Before 2005	Hd_Mixed	7.74	8,344.13	10.0%	834.41
Behind 425 Primrose Dr	B5	Dry Detention	Baseline	Before 2005	Ld_Mixed	4.26	2,122.02	10.0%	212.20
Behind 425 Primrose Dr	B5	Dry Detention	Baseline	Before 2005	Md_Mixed	8.99	7,376.94	10.0%	737.69
Behind 425 Primrose Dr	B5	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.84	918.71	10.0%	91.87
Langberg Cul-de-sac	B9	Dry Detention	Baseline	Before 2005	Forest	1.68	633.88	10.0%	63.39
Langberg Cul-de-sac	B9	Dry Detention	Baseline	Before 2005	Ld_Mixed	3.11	1,548.72	10.0%	154.87
Langberg Cul-de-sac	B9	Dry Detention	Baseline	Before 2005	Ld_Mixed	4.00	1,991.47	10.0%	199.15
Sweetheart Lane Cul-de-sac	B17	Dry Detention	Baseline	Before 2005	Forest	0.05	19.39	10.0%	1.94
Sweetheart Lane Cul-de-sac	B17	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.82	1,403.34	10.0%	140.33
Sweetheart Lane Cul-de-sac	B17	Dry Detention	Baseline	Before 2005	Md_Mixed	2.44	2,004.98	10.0%	200.50
Sweetheart Lane Cul-de-sac	B17	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.40	201.67	10.0%	20.17
Dickerson Rd Cul-de-sac	B18	Dry Detention	Baseline	Before 2005	Forest	0.31	118.95	10.0%	11.90
Dickerson Rd Cul-de-sac	B18	Dry Detention	Baseline	Before 2005	Hd_Mixed	1.11	1,198.41	10.0%	119.84
Dickerson Rd Cul-de-sac	B18	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.91	949.45	10.0%	94.95
Dickerson Rd Cul-de-sac	B18	Dry Detention	Baseline	Before 2005	Md_Mixed	6.22	5,108.68	10.0%	510.87
Dickerson Rd Cul-de-sac	B18	Dry Detention	Baseline	Before 2005	Ld_Mixed	7.74	3,856.29	10.0%	385.63
Dickerson Rd Cul-de-sac	B18	Dry Detention	Baseline	Before 2005	Forest	0.00	0.89	10.0%	0.09
500 Dickerson Rd	B19	Dry Detention	Baseline	Before 2005	Forest	0.02	7.43	10.0%	0.74
500 Dickerson Rd	B19	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.46	230.50	10.0%	23.05
500 Dickerson Rd	B19	Dry Detention	Baseline	Before 2005	Md_Mixed	2.50	2,054.82	10.0%	205.48
500 Dickerson Rd	B19	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.38	189.55	10.0%	18.95
THE POINT AT PENNBROOK STATION	B25	Dry Detention	Baseline	Before 2005	Hd_Mixed	3.76	4,057.58	10.0%	405.76
THE POINT AT PENNBROOK STATION	B25	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.70	350.30	10.0%	35.03
THE POINT AT PENNBROOK STATION	B25	Dry Detention	Baseline	Before 2005	Md_Mixed	7.30	5,992.10	10.0%	599.21
HARVEST LANE CUL-DE-SAC	B27	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.36	1,177.91	10.0%	117.79
HARVEST LANE CUL-DE-SAC	B27	Dry Detention	Baseline	Before 2005	Md_Mixed	0.53	438.74	10.0%	43.87
HARVEST LANE CUL-DE-SAC	B27	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.24	119.15	10.0%	11.92
Next to 317 Farm Ln	B28	Dry Detention	Baseline	Before 2005	Forest	0.07	26.70	10.0%	2.67
Next to 317 Farm Ln	B28	Dry Detention	Baseline	Before 2005	Ld_Mixed	3.90	1,941.74	10.0%	194.17
Next to 317 Farm Ln	B28	Dry Detention	Baseline	Before 2005	Md_Mixed	2.97	2,436.84	10.0%	243.68
Next to 317 Farm Ln	B28	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.46	728.12	10.0%	72.81
Next to 317 Farm Ln	B28	Dry Detention	Baseline	Before 2005	Hay/Past	0.30	178.57	10.0%	17.86
PENBROOK MIDDLE SCHOOL	B29	Dry Detention	Baseline	Before 2005	Hd_Mixed	0.23	246.80	10.0%	24.68

PENBROOK MIDDLE SCHOOL	B29	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.87	932.88	10.0%	93.29
PENBROOK MIDDLE SCHOOL	B29	Dry Detention	Baseline	Before 2005	Md_Mixed	2.59	2,129.35	10.0%	212.93
PENBROOK MIDDLE SCHOOL	B29	Dry Detention	Baseline	Before 2005	Ld_Mixed	8.12	4,044.95	10.0%	404.49
Infront of 1953 West Point Pike	B31	Dry Detention	Baseline	Before 2005	Forest	0.04	14.84	10.0%	1.48
Infront of 1953 West Point Pike	B31	Dry Detention	Baseline	Before 2005	Hd_Mixed	1.88	2,031.51	10.0%	203.15
Infront of 1953 West Point Pike	B31	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.65	324.26	10.0%	32.43
Infront of 1953 West Point Pike	B31	Dry Detention	Baseline	Before 2005	Md_Mixed	1.76	1,441.97	10.0%	144.20
Infront of 1953 West Point Pike	B31	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.71	355.12	10.0%	35.51
WASTEWATER TREATMENT PLANT	B32	Dry Detention	Baseline	Before 2005	Forest	0.05	19.12	10.0%	1.91
WASTEWATER TREATMENT PLANT	B32	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.32	658.88	10.0%	65.89
WASTEWATER TREATMENT PLANT	B32	Dry Detention	Baseline	Before 2005	Md_Mixed	0.87	717.15	10.0%	71.71
WASTEWATER TREATMENT PLANT	B32	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.01	1,002.95	10.0%	100.30
WASTEWATER TREATMENT PLANT	B32	Dry Detention	Baseline	Before 2005	Forest	0.62	235.40	10.0%	23.54
BEHIND 235 AND 241 ACORN LANE	B33	Dry Detention	Baseline	Before 2005	Cropland	0.52	1,337.84	10.0%	133.78
BEHIND 235 AND 241 ACORN LANE	B33	Dry Detention	Baseline	Before 2005	Forest	8.25	3,118.13	10.0%	311.81
BEHIND 235 AND 241 ACORN LANE	B33	Dry Detention	Baseline	Before 2005	Ld_Mixed	9.57	4,768.82	10.0%	476.88
BEHIND 235 AND 241 ACORN LANE	B33	Dry Detention	Baseline	Before 2005	Hd_Mixed	1.51	1,629.35	10.0%	162.94
BEHIND 235 AND 241 ACORN LANE	B33	Dry Detention	Baseline	Before 2005	Ld_Mixed	15.85	7,893.65	10.0%	789.37
BEHIND 235 AND 241 ACORN LANE	B33	Dry Detention	Baseline	Before 2005	Forest	1.63	614.58	10.0%	61.46
OLD CHURCH ROAD BETWEEN NORWOOD CIRCLE AND WOODFORD ROAD	B36	Dry Detention	Baseline	Before 2005	Forest	0.00	0.60	0.0%	0.00
OLD CHURCH ROAD BETWEEN NORWOOD CIRCLE AND WOODFORD ROAD	B36	Dry Detention	Baseline	Before 2005	Ld_Mixed	3.80	1,890.59	0.0%	0.00
OLD CHURCH ROAD BETWEEN NORWOOD CIRCLE AND WOODFORD ROAD	B36	Dry Detention	Baseline	Before 2005	Md_Mixed	0.12	99.13	0.0%	0.00
OLD CHURCH ROAD BETWEEN NORWOOD CIRCLE AND WOODFORD ROAD	B36	Dry Detention	Baseline	Before 2005	Ld_Mixed	18.56	9,242.69	0.0%	0.00
OLD CHURCH ROAD BETWEEN NORWOOD CIRCLE AND WOODFORD ROAD	B36	Dry Detention	Baseline	Before 2005	Forest	0.08	30.43	0.0%	0.00
OLD CHURCH ROAD BETWEEN NORWOOD CIRCLE AND WOODFORD ROAD	B36	Dry Detention	Baseline	Before 2005	Forest	1.56	588.65	0.0%	0.00
OLD CHURCH ROAD BETWEEN NORWOOD CIRCLE AND WOODFORD ROAD	B36	Dry Detention	Baseline	Before 2005	Forest	0.01	5.54	0.0%	0.00
BEHIND 425 CARMICHAEL DRIVE	B37	Dry Detention	Baseline	Before 2005	Forest	3.32	1,256.27	10.0%	125.63
BEHIND 425 CARMICHAEL DRIVE	B37	Dry Detention	Baseline	Before 2005	Ld_Mixed	3.01	1,500.62	10.0%	150.06
BEHIND 425 CARMICHAEL DRIVE	B37	Dry Detention	Baseline	Before 2005	Ld_Mixed	11.23	5,592.66	10.0%	559.27
BEHIND 425 CARMICHAEL DRIVE	B37	Dry Detention	Baseline	Before 2005	Forest	0.68	256.78	10.0%	25.68
130 DICKERSON ROAD	B38	Dry Detention	Baseline	Before 2005	Forest	0.02	6.64	10.0%	0.66
130 DICKERSON ROAD	B38	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.70	348.66	10.0%	34.87
130 DICKERSON ROAD	B38	Dry Detention	Baseline	Before 2005	Md_Mixed	0.53	437.35	10.0%	43.74
130 DICKERSON ROAD	B38	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.25	126.46	10.0%	12.65
At the intersection of Sumneytown Pike and Allentown Rd	B40	Dry Detention	Baseline	Before 2005	Hd_Mixed	0.87	936.13	10.0%	93.61
At the intersection of Sumneytown Pike and Allentown Rd	B40	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.12	61.15	10.0%	6.11
At the intersection of Sumneytown Pike and Allentown Rd	B40	Dry Detention	Baseline	Before 2005	Md_Mixed	1.75	1,435.40	10.0%	143.54
FOREST LANE CUL-DE-SAC	B41	Dry Detention	Baseline	Before 2005	Forest	16.10	6,088.32	10.0%	608.83
FOREST LANE CUL-DE-SAC	B41	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.67	1,329.83	10.0%	132.98
FOREST LANE CUL-DE-SAC	B41	Dry Detention	Baseline	Before 2005	Ld_Mixed	6.92	3,444.65	10.0%	344.46
FOREST LANE CUL-DE-SAC	B41	Dry Detention	Baseline	Before 2005	Hay/Past	0.00	2.58	10.0%	0.26
FOREST LANE CUL-DE-SAC	B41	Dry Detention	Baseline	Before 2005	Forest	0.55	207.99	10.0%	20.80
Behind 101 Weber Rd	B46	Dry Detention	Baseline	Before 2005	Forest	13.21	4,995.96	10.0%	499.60
Behind 101 Weber Rd	B46	Dry Detention	Baseline	Before 2005	Hd_Mixed	0.33	352.94	10.0%	35.29
Behind 101 Weber Rd	B46	Dry Detention	Baseline	Before 2005	Ld_Mixed	15.59	7,765.47	10.0%	776.55
Behind 101 Weber Rd	B46	Dry Detention	Baseline	Before 2005	Md_Mixed	11.14	9,144.74	10.0%	914.47

Behind 101 Weber Rd	B46	Dry Detention	Baseline	Before 2005	Ld_Mixed	18.59	9,261.08	10.0%	926.11
Behind 101 Weber Rd	B46	Dry Detention	Baseline	Before 2005	Forest	1.56	588.65	10.0%	58.86
Behind 101 Weber Rd	B46	Dry Detention	Baseline	Before 2005	Hay/Past	14.53	8,734.61	10.0%	873.46
WHEATON LANE	B47	Dry Detention	Baseline	Before 2005	Forest	0.65	245.05	10.0%	24.51
WHEATON LANE	B47	Dry Detention	Baseline	Before 2005	Ld_Mixed	7.17	3,572.65	10.0%	357.27
WHEATON LANE	B47	Dry Detention	Baseline	Before 2005	Ld_Mixed	18.15	9,042.17	10.0%	904.22
1180 WELSH LANE	B48	Dry Detention	Baseline	Before 2005	Forest	1.49	561.70	10.0%	56.17
1180 WELSH LANE	B48	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.74	867.55	10.0%	86.75
1180 WELSH LANE	B48	Dry Detention	Baseline	Before 2005	Md_Mixed	1.68	1,377.57	10.0%	137.76
1180 WELSH LANE	B48	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.40	199.92	10.0%	19.99
1180 WELSH LANE	B48	Dry Detention	Baseline	Before 2005	Hay/Past	5.96	3,582.09	10.0%	358.21
157 DICKERSON ROAD	B61	Dry Detention	Baseline	Before 2005	Hd_Mixed	1.52	1,634.31	10.0%	163.43
157 DICKERSON ROAD	B61	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.95	973.72	10.0%	97.37
157 DICKERSON ROAD	B61	Dry Detention	Baseline	Before 2005	Md_Mixed	5.02	4,120.07	10.0%	412.01
157 DICKERSON ROAD	B61	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.19	97.02	10.0%	9.70
Merck Basin 3	B63	Extended Dry Detention	Baseline	Before 2005	Hd_Mixed	10.88	11,723.87	60.0%	7,034.32
Merck Basin 3	B63	Extended Dry Detention	Baseline	Before 2005	Ld_Mixed	1.42	707.84	60.0%	424.71
Merck Basin 3	B63	Extended Dry Detention	Baseline	Before 2005	Md_Mixed	3.78	3,102.71	60.0%	1,861.63
Merck Basin 5	B64	Dry Detention	Baseline	Before 2005	Hd_Mixed	3.50	3,767.33	10.0%	376.73
Merck Basin 5	B64	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.92	459.94	10.0%	45.99
Merck Basin 5	B64	Dry Detention	Baseline	Before 2005	Md_Mixed	3.28	2,688.58	10.0%	268.86
Merck Basin 5	B64	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.46	227.85	10.0%	22.79
Merck Basin 6	B65	Dry Detention	Baseline	Before 2005	Hd_Mixed	3.62	3,902.39	10.0%	390.24
Merck Basin 6	B65	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.41	703.26	10.0%	70.33
Merck Basin 6	B65	Dry Detention	Baseline	Before 2005	Md_Mixed	3.69	3,029.93	10.0%	302.99
Merck Basin 6	B65	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.69	840.97	10.0%	84.10
Merck Basin 4	B66	Extended Dry Detention	Baseline	Before 2005	Hd_Mixed	74.10	79,864.07	60.0%	47,918.44
Merck Basin 4	B66	Extended Dry Detention	Baseline	Before 2005	Ld_Mixed	8.57	4,267.69	60.0%	2,560.61
Merck Basin 4	B66	Extended Dry Detention	Baseline	Before 2005	Md_Mixed	30.95	25,407.26	60.0%	15,244.36
Merck Basin 4	B66	Extended Dry Detention	Baseline	Before 2005	Ld_Mixed	7.77	3,868.35	60.0%	2,321.01
AMITY LANE CUL-DE-SAC	B68	Dry Detention	Baseline	Before 2005	Forest	0.80	301.05	10.0%	30.10
AMITY LANE CUL-DE-SAC	B68	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.72	1,355.90	10.0%	135.59
AMITY LANE CUL-DE-SAC	B68	Dry Detention	Baseline	Before 2005	Md_Mixed	0.17	138.17	10.0%	13.82
AMITY LANE CUL-DE-SAC	B68	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.85	1,417.80	10.0%	141.78
Behind 249 Goldenrod Dr	B69	ST	Baseline	Before 2005	Hd_Mixed	9.99	10,769.01	60.0%	6,457.75
Behind 249 Goldenrod Dr	B69	ST	Baseline	Before 2005	Ld_Mixed	2.37	1,180.88	60.0%	708.13
Behind 249 Goldenrod Dr	B69	ST	Baseline	Before 2005	Md_Mixed	11.44	9,391.42	60.0%	5,631.66
Behind 249 Goldenrod Dr	B69	ST	Baseline	Before 2005	Ld_Mixed	0.32	161.66	60.0%	96.94

Table 8. BMPs and Sediment Reduction used to Calculate the Baseline Load in the Skippack Planning Area

Project Name	BMP Name	BMP Type	Baseline, Existing, or Proposed	Year Installed	MapShed Land Cover of Drainage Area	Drainage Area (ac)	Treatment Depth (in)	Stream Restoration* Length (ft) - Qualified projects only	TSS Load (lbs/yr)	TSS Reduction (%)	TSS Reduction (lbs/yr)	TSS Reduction (tons/yr)
Behind 830 Collins Ave	B1	Dry Detention	Baseline	Before 2005	Ld_Mixed	6.856909416			6,377.75	10.0%	637.77	0.32
Behind 830 Collins Ave	B1	Dry Detention	Baseline	Before 2005	Md_Mixed	0.017388994			28.48	10.0%	2.85	0.00
Behind 830 Collins Ave	B1	Dry Detention	Baseline	Before 2005	Ld_Mixed	7.672438964			7,136.29	10.0%	713.63	0.36
Behind 830 Collins Ave	B1	Dry Detention	Baseline	Before 2005	Hay/Past	1.312833113			1,062.51	10.0%	106.25	0.05
Behind 2011 Ryans Run	B2	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.492881553			2,318.68	10.0%	231.87	0.12
Behind 2011 Ryans Run	B2	Dry Detention	Baseline	Before 2005	Md_Mixed	0.998938926			1,636.31	10.0%	163.63	0.08
Behind 2011 Ryans Run	B2	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.729404588			678.43	10.0%	67.84	0.03
Behind 2011 Ryans Run	B2	Dry Detention	Baseline	Before 2005	Forest	0.162641299			106.31	10.0%	10.63	0.01
Next to 850 Twinlyn Dr	B6	Dry Detention	Baseline	Before 2005	Forest	1.678282519			1,097.03	10.0%	109.70	0.05
Next to 850 Twinlyn Dr	B6	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.374740969			1,278.67	10.0%	127.87	0.06
Next to 850 Twinlyn Dr	B6	Dry Detention	Baseline	Before 2005	Ld_Mixed	5.89567058			5,483.68	10.0%	548.37	0.27
Next to 850 Twinlyn Dr	B6	Dry Detention	Baseline	Before 2005	Open_Land	0.900435031			629.48	10.0%	62.95	0.03
Next to 850 Twinlyn Dr	B6	Dry Detention	Baseline	Before 2005	Hay/Past	3.168306411			2,564.19	10.0%	256.42	0.13
Behind 893 Quinn Ln	B7	Dry Detention	Baseline	Before 2005	Forest	0.045775887			29.92	10.0%	2.99	0.00
Behind 893 Quinn Ln	B7	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.770956567			2,577.32	10.0%	257.73	0.13
Behind 893 Quinn Ln	B7	Dry Detention	Baseline	Before 2005	Ld_Mixed	5.000944425			4,651.48	10.0%	465.15	0.23
Behind 893 Quinn Ln	B7	Dry Detention	Baseline	Before 2005	Forest	1.265680056			827.33	10.0%	82.73	0.04
Behind 838 Quinn Ln	B8	Dry Detention	Baseline	Before 2005	Forest	0.303485453			198.38	10.0%	19.84	0.01
Behind 838 Quinn Ln	B8	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.575258089			1,465.18	10.0%	146.52	0.07
Behind 838 Quinn Ln	B8	Dry Detention	Baseline	Before 2005	Ld_Mixed	3.01534221			2,804.63	10.0%	280.46	0.14
Behind 760 Newport Ln	B12	Dry Detention	Baseline	Before 2005	Forest	1.603031359			1,047.84	0.0%	0.00	0.00
Behind 760 Newport Ln	B12	Dry Detention	Baseline	Before 2005	Hd_Mixed	1.129543327			2,550.66	0.0%	0.00	0.00
Behind 760 Newport Ln	B12	Dry Detention	Baseline	Before 2005	Ld_Mixed	10.95406506			10,188.59	0.0%	0.00	0.00
Behind 760 Newport Ln	B12	Dry Detention	Baseline	Before 2005	Md_Mixed	3.766849994			6,170.29	0.0%	0.00	0.00
Behind 760 Newport Ln	B12	Dry Detention	Baseline	Before 2005	Ld_Mixed	25.27368822			23,507.56	0.0%	0.00	0.00
Behind 760 Newport Ln	B12	Dry Detention	Baseline	Before 2005	Forest	0.480306688			313.96	0.0%	0.00	0.00
Behind 1209 Patty's Cir	B13	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.94516228			1,809.23	10.0%	180.92	0.09
Behind 1209 Patty's Cir	B13	Dry Detention	Baseline	Before 2005	Md_Mixed	0.889517551			1,457.07	10.0%	145.71	0.07
Behind 1209 Patty's Cir	B13	Dry Detention	Baseline	Before 2005	Ld_Mixed	7.555448325			7,027.47	10.0%	702.75	0.35
At intersection of Supplee Rd and Gwynedale Way	B14	Dry Detention	Baseline	Before 2005	Ld_Mixed	7.361853819			6,847.41	10.0%	684.74	0.34
At intersection of Supplee Rd and Gwynedale Way	B14	Dry Detention	Baseline	Before 2005	Md_Mixed	3.48109975			5,702.22	10.0%	570.22	0.29
At intersection of Supplee Rd and Gwynedale Way	B14	Dry Detention	Baseline	Before 2005	Ld_Mixed	4.173848131			3,882.18	10.0%	388.22	0.19
Next to Corpus Christi School Playground	B15	Dry Detention	Baseline	Before 2005	Hd_Mixed	1.236264689			2,791.65	10.0%	279.17	0.14
Next to Corpus Christi School Playground	B15	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.537235454			2,359.93	10.0%	235.99	0.12
Next to Corpus Christi School Playground	B15	Dry Detention	Baseline	Before 2005	Md_Mixed	5.867923969			9,611.95	10.0%	961.20	0.48
Next to Corpus Christi School Playground	B15	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.456576915			424.67	10.0%	42.47	0.02
Next to North Penn Car Wash	B16	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.1066737			1,029.34	10.0%	102.93	0.05
Next to North Penn Car Wash	B16	Dry Detention	Baseline	Before 2005	Md_Mixed	0.447508778			733.04	10.0%	73.30	0.04
Next to North Penn Car Wash	B16	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.40732793			1,308.98	10.0%	130.90	0.07
Behind 133 Providence Ln	B21	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.236973573			2,080.65	10.0%	208.07	0.10
Behind 133 Providence Ln	B21	Dry Detention	Baseline	Before 2005	Md_Mixed	1.401875026			2,296.34	10.0%	229.63	0.11
Behind 133 Providence Ln	B21	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.854482301			1,724.89	10.0%	172.49	0.09
Behind 1125 Kingsley Hall Dr	B22	Dry Detention	Baseline	Before 2005	Forest	0.264142601			172.66	10.0%	17.27	0.01
Behind 1125 Kingsley Hall Dr	B22	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.598147484			556.35	10.0%	55.63	0.03
Behind 1125 Kingsley Hall Dr	B22	Dry Detention	Baseline	Before 2005	Md_Mixed	2.354797557			3,857.28	10.0%	385.73	0.19
Behind 1125 Kingsley Hall Dr	B22	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.851125395			1,721.77	10.0%	172.18	0.09

Behind 1125 Kingsley Hall Dr	B22	Dry Detention	Baseline	Before 2005	Open_Land	2.693205971			1,882.78	10.0%	188.28	0.09
In front of 1101 S Broad St	B23	Dry Detention	Baseline	Before 2005	Forest	0.015597145			10.20	10.0%	1.02	0.00
In front of 1101 S Broad St	B23	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.393809572			1,296.41	10.0%	129.64	0.06
In front of 1101 S Broad St	B23	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.172747988			160.68	10.0%	16.07	0.01
In front of 1101 S Broad St	B23	Dry Detention	Baseline	Before 2005	Open_Land	0.293724087			205.34	10.0%	20.53	0.01
Behind 141 Providence Ln	B24	Dry Detention	Baseline	Before 2005	Ld_Mixed	3.025660988			2,814.23	10.0%	281.42	0.14
Behind 141 Providence Ln	B24	Dry Detention	Baseline	Before 2005	Md_Mixed	1.441346031			2,361.00	10.0%	236.10	0.12
Behind 141 Providence Ln	B24	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.132009268			1,983.02	10.0%	198.30	0.10
Behind 1416 Oxford Cir	B26	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.114959662			1,037.05	10.0%	103.70	0.05
Behind 1416 Oxford Cir	B26	Dry Detention	Baseline	Before 2005	Md_Mixed	3.765475283			6,168.04	10.0%	616.80	0.31
Behind 1416 Oxford Cir	B26	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.385743727			358.79	10.0%	35.88	0.02
Next to 749 Anne's Ct	B30	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.180272017			2,027.91	10.0%	202.79	0.10
Next to 749 Anne's Ct	B30	Dry Detention	Baseline	Before 2005	Md_Mixed	0.441918961			723.89	10.0%	72.39	0.04
Next to 749 Anne's Ct	B30	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.224980354			2,069.50	10.0%	206.95	0.10
Behind 762 Grissom Dr	B34	Dry Detention	Baseline	Before 2005	Ld_Mixed	4.148537335			3,858.64	10.0%	385.86	0.19
Behind 762 Grissom Dr	B34	Dry Detention	Baseline	Before 2005	Ld_Mixed	4.455315034			4,143.98	10.0%	414.40	0.21
Behind 762 Grissom Dr	B34	Dry Detention	Baseline	Before 2005	Open_Land	2.478061995			1,732.37	10.0%	173.24	0.09
Behind 762 Grissom Dr	B34	Dry Detention	Baseline	Before 2005	Hay/Past	0.459471973			371.86	10.0%	37.19	0.02
Next to 1985 Blue Fox Dr	B35	Dry Detention	Baseline	Before 2005	Ld_Mixed	3.226163824			3,000.72	10.0%	300.07	0.15
Next to 1985 Blue Fox Dr	B35	Dry Detention	Baseline	Before 2005	Ld_Mixed	3.806971612			3,540.94	10.0%	354.09	0.18
Next to 1985 Blue Fox Dr	B35	Dry Detention	Baseline	Before 2005	Hay/Past	1.230316045			995.72	10.0%	99.57	0.05
In front of 1025 S Broad St	B39	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.458674126			1,356.74	10.0%	135.67	0.07
In front of 1025 S Broad St	B39	Dry Detention	Baseline	Before 2005	Md_Mixed	3.385890138			5,546.26	10.0%	554.63	0.28
In front of 1025 S Broad St	B39	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.976024896			907.82	10.0%	90.78	0.05
Next to 874 Fulton Ave	B42	Dry Detention	Baseline	Before 2005	Forest	0.554199291			362.26	10.0%	36.23	0.02
Next to 874 Fulton Ave	B42	Dry Detention	Baseline	Before 2005	Ld_Mixed	13.2260518			12,301.82	10.0%	1,230.18	0.62
Next to 874 Fulton Ave	B42	Dry Detention	Baseline	Before 2005	Ld_Mixed	6.588817215			6,128.39	10.0%	612.84	0.31
Next to 874 Fulton Ave	B42	Dry Detention	Baseline	Before 2005	Forest	2.001413713			1,308.25	10.0%	130.82	0.07
Behind 1330 Valley Dr	B43	Dry Detention	Baseline	Before 2005	Forest	0.021092697			13.79	10.0%	1.38	0.00
Behind 1330 Valley Dr	B43	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.862409411			2,662.38	10.0%	266.24	0.13
Behind 1330 Valley Dr	B43	Dry Detention	Baseline	Before 2005	Md_Mixed	2.956980728			4,843.68	10.0%	484.37	0.24
Behind 1330 Valley Dr	B43	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.885891654			823.99	10.0%	82.40	0.04
Behind 1330 Valley Dr	B43	Dry Detention	Baseline	Before 2005	Forest	0.002375348			1.55	10.0%	0.16	0.00
Behind North Penn Market Place Strip Mall	B44	Dry Detention	Baseline	Before 2005	Forest	0.144661394			94.56	10.0%	9.46	0.00
Behind North Penn Market Place Strip Mall	B44	Dry Detention	Baseline	Before 2005	Hd_Mixed	0.217829212			491.89	10.0%	49.19	0.02
Behind North Penn Market Place Strip Mall	B44	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.188841191			1,105.76	10.0%	110.58	0.06
Behind North Penn Market Place Strip Mall	B44	Dry Detention	Baseline	Before 2005	Md_Mixed	1.504676501			2,464.74	10.0%	246.47	0.12
Behind North Penn Market Place Strip Mall	B44	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.125112451			116.37	10.0%	11.64	0.01
Behind 1399 Gwynedale Way	B45	Dry Detention	Baseline	Before 2005	Forest	0.006059758			3.96	10.0%	0.40	0.00
Behind 1399 Gwynedale Way	B45	Dry Detention	Baseline	Before 2005	Ld_Mixed	5.346541466			4,972.93	10.0%	497.29	0.25
Behind 1399 Gwynedale Way	B45	Dry Detention	Baseline	Before 2005	Md_Mixed	6.362246237			10,421.68	10.0%	1,042.17	0.52
Behind 1399 Gwynedale Way	B45	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.829693824			771.71	10.0%	77.17	0.04
Behind 950 Freedom Ct	B49	Dry Detention	Baseline	Before 2005	Forest	0.03415156			22.32	10.0%	2.23	0.00
Behind 950 Freedom Ct	B49	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.839898701			1,711.33	10.0%	171.13	0.09
Behind 950 Freedom Ct	B49	Dry Detention	Baseline	Before 2005	Md_Mixed	1.939946408			3,177.73	10.0%	317.77	0.16
Behind 950 Freedom Ct	B49	Dry Detention	Baseline	Before 2005	Ld_Mixed	2.432901055			2,262.89	10.0%	226.29	0.11
B50 Under driveway of 164 Dawn Drive B52 Next to 157 Bradford Ln	B50_B52	Dry Detention	Baseline	Before 2005	Ld_Mixed	25.94278443			24,129.90	10.0%	2,412.99	1.21
B50 Under driveway of 164 Dawn Drive B52 Next to 157 Bradford Ln	B50_B52	Dry Detention	Baseline	Before 2005	Md_Mixed	0.503721563			825.12	10.0%	82.51	0.04
B50 Under driveway of 164 Dawn Drive B52 Next to 157 Bradford Ln	B50_B52	Dry Detention	Baseline	Before 2005	Ld_Mixed	8.787918145			8,173.82	10.0%	817.38	0.41
Behind 858 Jackson St	B51	Dry Detention	Baseline	Before 2005	Ld_Mixed	3.530108682			3,283.42	10.0%	328.34	0.16

Behind 858 Jackson St	B51	Dry Detention	Baseline	Before 2005	Md_Mixed	0.332550791			544.73	10.0%	54.47	0.03
Behind 858 Jackson St	B51	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.517367723			481.21	10.0%	48.12	0.02
In front of North Penn Art 720 S Broad St	B53	Dry Detention	Baseline	Before 2005	Ld_Mixed	0.157376679			146.38	10.0%	14.64	0.01
Merck Basin 1	B62	Dry Detention	Baseline	Before 2005	Hd_Mixed	4.372535415			9,873.77	0.0%	0.00	0.00
Merck Basin 1	B62	Dry Detention	Baseline	Before 2005	Ld_Mixed	3.561006481			3,312.16	0.0%	0.00	0.00
Merck Basin 1	B62	Dry Detention	Baseline	Before 2005	Md_Mixed	10.01428663			16,403.91	0.0%	0.00	0.00
Merck Basin 1	B62	Dry Detention	Baseline	Before 2005	Ld_Mixed	1.320032073			1,227.79	0.0%	0.00	0.00
Merck Basin 2	B67	Extended Dry Detention	Baseline	Before 2005	Hd_Mixed	55.08901928			124,398.35	60.0%	74,639.01	37.32
Merck Basin 2	B67	Extended Dry Detention	Baseline	Before 2005	Ld_Mixed	9.737686084			9,057.22	60.0%	5,434.33	2.72
Merck Basin 2	B67	Extended Dry Detention	Baseline	Before 2005	Md_Mixed	29.71538269			48,675.29	60.0%	29,205.18	14.60
Merck Basin 2	B67	Extended Dry Detention	Baseline	Before 2005	Ld_Mixed	1.40117559			1,303.26	60.0%	781.96	0.39

Table 9. BMPs and Sediment Reduction Credit used to calculate the Existing Load in the Wissahickon Planning Area

Project Name	BMP Name	BMP Type	Baseline, Existing, or Proposed	Year Installed	MapShed Land Cover of Drainage Area	Drainage Area (ac)	Stream Restoration* Length (ft) - Qualified projects only	Treatment Depth (in/imp. ac) Manual Override - use if no impervious area	Effective Treatment Depth (in/imp. ac)	Impervious (%)	TSS Load (lbs/yr)	TSS Reduction (%)	TSS Reduction (lbs/yr)
Sumneytown Pike Bioretention Area	B57	RR	Existing	After 2005	Forest	0.15		2.12	2.12	0.0%	55.37	84.1%	46.59
Sumneytown Pike Bioretention Area	B57	RR	Existing	After 2005	Ld_Mixed	0.02		2.12	2.12	15.0%	7.85	84.1%	6.60
Sumneytown Pike Bioretention Area	B57	RR	Existing	After 2005	Md_Mixed	0.26		2.12	2.12	52.0%	211.46	84.1%	177.94
Sumneytown Pike Bioretention Area	B57	RR	Existing	After 2005	Ld_Mixed	0.22		2.12	2.12	15.0%	107.20	84.1%	90.21
Pennbrook Basins	B58	Dry Detention	Existing	After 2005	Forest	0.11			#N/A	0.0%	42.47	10.0%	4.25
Pennbrook Basins	B58	Dry Detention	Existing	After 2005	Hd_Mixed	1.55			0.00	87.0%	1,670.66	10.0%	167.07
Pennbrook Basins	B58	Dry Detention	Existing	After 2005	Ld_Mixed	9.36			0.00	15.0%	4,663.41	10.0%	466.34
Pennbrook Basins	B58	Dry Detention	Existing	After 2005	Md_Mixed	4.07			0.00	52.0%	3,338.61	10.0%	333.86
Pennbrook Basins	B58	Dry Detention	Existing	After 2005	Ld_Mixed	18.28			0.00	15.0%	9,103.37	10.0%	910.34
Pennbrook Basins	B58	Dry Detention	Existing	After 2005	Hay/Past	8.88			#N/A	0.0%	5,337.11	10.0%	533.71
Pennbrook Basins	B59	Dry Detention	Existing	After 2005	Cropland	0.03			#N/A	0.0%	87.36	10.0%	8.74
Pennbrook Basins	B59	Dry Detention	Existing	After 2005	Forest	0.02			#N/A	0.0%	7.66	10.0%	0.77
Pennbrook Basins	B59	Dry Detention	Existing	After 2005	Ld_Mixed	3.47			0.00	15.0%	1,727.91	10.0%	172.79
Pennbrook Basins	B59	Dry Detention	Existing	After 2005	Md_Mixed	0.02			0.00	52.0%	13.89	10.0%	1.39
Pennbrook Basins	B59	Dry Detention	Existing	After 2005	Ld_Mixed	13.90			0.00	15.0%	6,921.31	10.0%	692.13
Pennbrook Basins	B60	Dry Detention	Existing	After 2005	Cropland	5.95			#N/A	0.0%	15,233.30	10.0%	1,523.33
Pennbrook Basins	B60	Dry Detention	Existing	After 2005	Forest	7.93			#N/A	0.0%	3,000.52	10.0%	300.05
Pennbrook Basins	B60	Dry Detention	Existing	After 2005	Ld_Mixed	14.75			0.00	15.0%	7,346.49	10.0%	734.65
Pennbrook Basins	B60	Dry Detention	Existing	After 2005	Md_Mixed	2.89			0.00	52.0%	2,368.96	10.0%	236.90
Pennbrook Basins	B60	Dry Detention	Existing	After 2005	Ld_Mixed	20.10			0.00	15.0%	10,013.29	10.0%	1,001.33
Pennbrook Basins	B60	Dry Detention	Existing	After 2005	Hay/Past	9.51			#N/A	0.0%	5,714.66	10.0%	571.47
Pennbrook Basins	B60	Dry Detention	Existing	After 2005	Forest	1.33			#N/A	0.0%	504.56	10.0%	50.46
WVWA Retrofit Old Church Rd Basin	B36	Extended Dry Detention	Existing	After 2005	Forest	0.00			#N/A	0.0%	0.60	60.0%	0.36
WVWA Retrofit Old Church Rd Basin	B36	Extended Dry Detention	Existing	After 2005	Ld_Mixed	3.80			0.00	15.0%	1,890.59	60.0%	1,134.36
WVWA Retrofit Old Church Rd Basin	B36	Extended Dry Detention	Existing	After 2005	Md_Mixed	0.12			0.00	52.0%	99.13	60.0%	59.48
WVWA Retrofit Old Church Rd Basin	B36	Extended Dry Detention	Existing	After 2005	Ld_Mixed	18.56			0.00	15.0%	9,242.69	60.0%	5,545.62
WVWA Retrofit Old Church Rd Basin	B36	Extended Dry Detention	Existing	After 2005	Forest	0.08			#N/A	0.0%	30.43	60.0%	18.26
WVWA Retrofit Old Church Rd Basin	B36	Extended Dry Detention	Existing	After 2005	Forest	1.56			#N/A	0.0%	588.65	60.0%	353.19
WVWA Retrofit Old Church Rd Basin	B36	Extended Dry Detention	Existing	After 2005	Forest	0.01			#N/A	0.0%	5.54	60.0%	3.32
WVWA Stream Restoration Upstream of UGT WWTP	SR2	Stream Restoration	Existing	After 2005			711		#N/A	#N/A	#N/A	0.0%	81,765.00
WVWA Infiltration Berm	B71	ST	Existing	After 2005	Forest	0.09		2.50	2.50	0.0%	32.60	78.8%	25.70
WVWA Infiltration Berm	B71	ST	Existing	After 2005	Ld_Mixed	1.54		2.50	2.50	15.0%	768.59	78.8%	605.74
WVWA Infiltration Berm	B71	ST	Existing	After 2005	Ld_Mixed	15.39		2.50	2.50	15.0%	7,667.02	78.8%	6,042.52
WVWA Infiltration Berm	B71	ST	Existing	After 2005	Forest	1.19		2.50	2.50	0.0%	451.43	78.8%	355.78
WVWA Infiltration Berm	B71	ST	Existing	After 2005	Hay/Past	6.00		2.50	2.50	0.0%	3,607.57	78.8%	2,843.19
WVWA Infiltration Berm	B71	ST	Existing	After 2005	Forest	1.31		2.50	2.50	0.0%	493.89	78.8%	389.24

Table 10. BMPs and Sediment Reduction Credit used to calculate the Exisiting Load in the Skippack Planning Area

Project Name	BMP Name	BMP Type	Baseline, Existing, or Proposed	Year Installed	MapShed Land Cover of Drainage Area	Drainage Area (ac)	Treatment Depth (in)	Stream Restoration* Length (ft) - Qualified projects only	TSS Load (lbs/yr)	TSS Reduction (%)	TSS Reduction (lbs/yr)	TSS Reduction (tons/yr)
In front of BA Salon 716 S Broad St	B54	Extended Dry Detention	Existing	After 2005	Ld_Mixed	0.185283665			172.34	60.0%	103.40	0.05
In front of BA Salon 716 S Broad St	B54	Extended Dry Detention	Existing	After 2005	Ld_Mixed	0.015360415			14.29	60.0%	8.57	0.00
Zacharias Creek Streambank Restoration	SR1	Stream Restoration	Existing	After 2005				250	#N/A	0.0%	28,750.00	14.38
Zacharias Creek Riparian Buffer	RB1	RR	Existing	After 2005	Ld_Mixed	0.129954603			120.87	60.0%	72.52	0.04
Zacharias Creek Riparian Buffer	RB1	RR	Existing	After 2005	Forest	0.030967049			20.24	60.0%	12.15	0.01
Zacharias Creek Riparian Buffer	RB1	RR	Existing	After 2005	Hay/Past	0.018183273			14.72	60.0%	8.83	0.00
Zacharias Creek Riparian Buffer	RB1	RR	Existing	After 2005	Hd_Mixed	0.328618975			742.07	60.0%	445.24	0.22
Zacharias Creek Riparian Buffer	RB1	RR	Existing	After 2005	Forest	0.464571469			303.67	60.0%	182.20	0.09
Zacharias Creek Riparian Buffer	RB1	RR	Existing	After 2005	Hay/Past	0.185782304			150.36	60.0%	90.21	0.05
Zacharias Creek Riparian Buffer	RB1	RR	Existing	After 2005	Md_Mixed	0.851254881			1,394.40	60.0%	836.64	0.42
Whittaker Park Riparian Buffer	RB2	RR	Existing	After 2005	Cropland	0.042162396			92.37	60.0%	55.42	0.03
Whittaker Park Riparian Buffer	RB2	RR	Existing	After 2005	Ld_Mixed	0.254833346			237.03	60.0%	142.22	0.07
Whittaker Park Riparian Buffer	RB2	RR	Existing	After 2005	Forest	0.194565188			127.18	60.0%	76.31	0.04
Whittaker Park Riparian Buffer	RB2	RR	Existing	After 2005	Hay/Past	1.036052822			838.50	60.0%	503.10	0.25
Whittaker Park Riparian Buffer	RB2	RR	Existing	After 2005	Md_Mixed	0.657225943			1,076.57	60.0%	645.94	0.32

Table 11. BMPs and Sediment Reduction Credit used to meet the WLA in the Wissahickon Planning Area

Project Name	BMP Name	BMP Type	Baseline, Existing, or Proposed	Year Installed	Stream Restoration* Length (ft) - Qualified projects only	Impervious (%)	TSS Load (lbs/yr)	TSS Reduction (%)	TSS Reduction (lbs/yr)
WVWA Proposed Stream Restoration in PECO ROW 1	P1 - SR3	Stream Restoration	2019-2024 Proposed	2021	1775	#N/A	#N/A	0.0%	204,125.00
WVWA Proposed Stream Restoration in PECO ROW 2&3	P2 - SR4&5	Stream Restoration	2024-2029 Proposed	2029	615	#N/A	#N/A	0.0%	70,725.00
						0.0%	#N/A	100.0%	#N/A
						0.0%	#N/A	100.0%	#N/A
						0.0%	#N/A	100.0%	#N/A
						0.0%	#N/A	100.0%	#N/A
						0.0%	#N/A	100.0%	#N/A
						0.0%	#N/A	100.0%	#N/A
						0.0%	#N/A	100.0%	#N/A
						0.0%	#N/A	100.0%	#N/A
						0.0%	#N/A	100.0%	#N/A
						0.0%	#N/A	100.0%	#N/A

Table 12. BMPs and Sediment Reduction Credit used to achieve the WLA in the Skippack Planning Area

Project Name	BMP Name	BMP Type	Baseline, Existing, or Proposed	Year Installed	MapShed Land Cover of Drainage Area	Drainage Area (ac)	Treatment Depth (in)	Stream Restoration* Length (ft) - Qualified projects only	TSS Load (lbs/yr)	TSS Reduction (%)	TSS Reduction (lbs/yr)	TSS Reduction (tons/yr)
Retrofit Merck Basin1	P3 -B62 Retrofit	Extended Dry Detention	2019-2024 Proposed	2024	Hd_Mixed	4.37			9,873.77	60.0%	5,924.26	2.96
Retrofit Merck Basin1	P3 -B62 Retrofit	Extended Dry Detention	2019-2024 Proposed	2024	Ld_Mixed	3.56			3,312.16	60.0%	1,987.30	0.99
Retrofit Merck Basin1	P3 -B62 Retrofit	Extended Dry Detention	2019-2024 Proposed	2024	Md_Mixed	10.01			16,403.91	60.0%	9,842.34	4.92
Retrofit Merck Basin1	P3 -B62 Retrofit	Extended Dry Detention	2019-2024 Proposed	2024	Ld_Mixed	1.32			1,227.79	60.0%	736.67	0.37
Retrofit Township Basin behind 760 Newport Ln	P4 - B12 Retrofit	Extended Dry Detention	2019-2024 Proposed	2024	Forest	1.60			1,047.84	60.0%	628.70	0.31
Retrofit Township Basin behind 760 Newport Ln	P4 - B12 Retrofit	Extended Dry Detention	2019-2024 Proposed	2024	Hd_Mixed	1.13			2,550.66	60.0%	1,530.40	0.77
Retrofit Township Basin behind 760 Newport Ln	P4 - B12 Retrofit	Extended Dry Detention	2019-2024 Proposed	2024	Ld_Mixed	10.95			10,188.59	60.0%	6,113.16	3.06
Retrofit Township Basin behind 760 Newport Ln	P4 - B12 Retrofit	Extended Dry Detention	2019-2024 Proposed	2024	Md_Mixed	3.77			6,170.29	60.0%	3,702.17	1.85
Retrofit Township Basin behind 760 Newport Ln	P4 - B12 Retrofit	Extended Dry Detention	2019-2024 Proposed	2024	Ld_Mixed	25.27			23,507.56	60.0%	14,104.54	7.05
Retrofit Township Basin behind 760 Newport Ln	P4 - B12 Retrofit	Extended Dry Detention	2019-2024 Proposed	2024	Forest	0.48			313.96	60.0%	188.38	0.09
Streambank Rest Unamed Trib from Merck to Towam Cr	P5 - SR6	Stream Restoration	2024-2029 Proposed	2029				1000	#N/A	0.0%	115,000.00	57.50
Streambank Rest Unamed Trib from Merck to Towam Cr	P6 - SR7	Stream Restoration	2024-2029 Proposed	2029				205	#N/A	0.0%	23,575.00	11.79