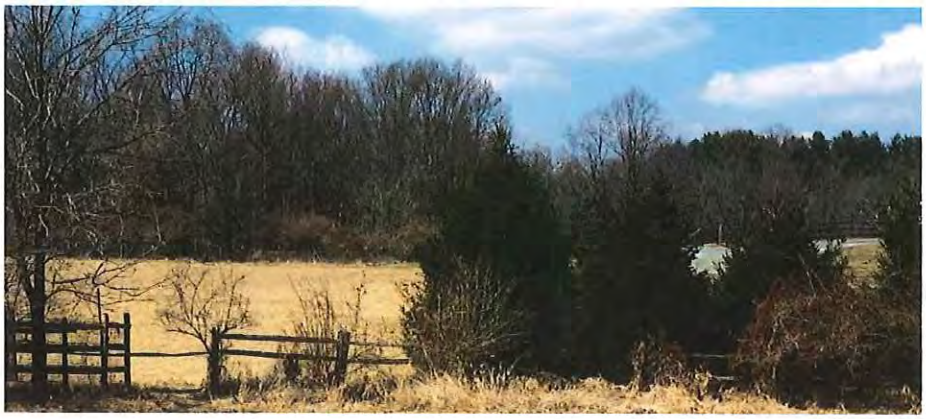

P.O. Box 1
Pocopson Township, PA 19366
O: 610.793.2151
www.pocopson.org

POCOPSON TOWNSHIP

CHESTER COUNTY, PA

MS4 TMDL PLAN

DUE: September 16, 2017

600 Eagleview Boulevard, 2nd Floor
Exton, PA 19341
O: 610.640.3500 | F: 610.640.3503
www.mccormicktaylor.com

MS4 TMDL PLAN INDEX

Introduction

Section A- Public Participation

Section B – Map

Section C – Pollutant of Concern

Section D – Existing Load for Pollutant of Concern

Section E – Wasteload Allocation (WLA)

Section F – Analysis of TMDL Objectives

1.) **Long-Term Reduction**
2.) **Short –Term Reduction**

Section G – BMP's to Achieve the Minimum Required Reductions in Pollutant Load

Section H – Funding Mechanisms

Section I – Responsible Parties for Operation & Maintenance (O&M) of BMP's

Section J – Key Definitions

Appendix A – Christina Basin TMDL Report Land Use Areas & Allocations

Appendix B – Christina Basin TMDL Report Baseline Loads and Allocations

Appendix C – Public Notice and Public Comments

Appendix D – MS4 Maps

Appendix E – BMP Operations and Maintenance Responsibilities

Introduction

This document is Pocopson Township's Municipal Separate Storm Sewer Systems (MS4) Total Maximum Daily Load (TMDL) Plan. Pocopson Township is located within the Brandywine Creek Watershed which is part of the Brandywine-Christina Watershed (HUC # 02040205). The Township is required to develop and implement a TMDL Plan to reduce the pollutant load and meet the Waste Load Allocation (WLA) in accordance with the following TMDL Report:

> Total Maximum Daily Loads for Bacteria and Sediment in the Christina River Basin, Pennsylvania, Delaware, and Maryland. September 2006. U.S. Environmental Protection Agency, Philadelphia, PA.

This MS4 TMDL Plan has been prepared in accordance with the requirements of the NPDES Individual Permit to Discharge Stormwater from Small Municipal Separate Storm Sewer Systems (MS4s) Application, and with guidance provided by the Christina Basin TMDL Implementation Plan (C-TIP) Partnership. The plan has been developed to maintain the designated organization provided in PADEP's TMDL Plan Instructions (3800-PM-BCW0200d Rev. 3/2017).

Upon DEP's approval, short-term implementation of Pocopson Township's MS4 TMDL Plan will occur within the next 5 years and long term implementation will continue until the Township's WLA is achieved.

Section A- Public Participation

Pocopson Township's MS4 TMDL Plan will be publicly advertised in the Daily Local News, a local newspaper available to residents of Chester County. The plan will be made available on the Pocopson Township website, www.pocopson.org, and at the Township office for review by the public. The advertisement will be made 45 days prior to the TMDL Plan due date, wherein the plan will be available for public comment for 30 days and discussed at a regularly scheduled Board of Supervisors meeting.

All comments, questions, concerns, and responses to the proposed TMDL Plan received by the Township will be incorporated into the report following the 30 day comment period. See Appendix C for:

1.) Public Notice of TMDL Plan (Proof of Publication)
2.) Written Comments Received from the Public regarding the TMDL Plan
3.) Pocopson Township's Record of Consideration of all Comments Received in Public Comment Period.

The following dates outline Pocopson Township's Public Participation:

Post on Website/Hard Copy Available at Township Office:	**7-31-2017 to 8-30-2017**
Advertise in Daily Local Newspaper:	**7-31-2017**
Public Comment Period:	**7-31-2017 to 8-30-2017**
Public Meeting / Board of Supervisors Meeting:	**8-14-2017**
Comment Period Closes:	**8-30-2017**
Update MS4 TMDL Plan:	**8-30-2017 to 9-13-2017**
Submit to PA DEP:	**9-16-2017**

Section B – Maps

Appendix D contains Pocopson Township's MS4 Maps which depict the following elements:

- MS4 Storm Sewer System and Outfalls
- Urbanized Area
- Land Uses
- Storm Sewershed boundary associated w/ each MS4 Outfall that discharges to TMDL waters
- Storm Sewershed Drainage Areas
- Proposed locations of Future BMPs

Section C – Pollutant of Concern

The following TMDL pollutant as presented in the EPA's Total Maximum Daily Loads for Bacteria and Sediment in the Christina River Basin, Pennsylvania, Delaware, and Maryland. September 2006, is applicable to Pocopson Township because a Waste Load Allocation has been assigned (See Appendix A and B). A map depicting the below TMDL Sub-basins and Storm Sewersheds is included in Section B.

1.) B15 Storm Sewershed Pollutant of Concern is Sediment.
2.) B31 Storm Sewershed Pollutant of Concern is Sediment.

Section D – Existing Load for Pollutant of Concern

Table 1: Existing (Baseline) Loading for Pocopson Township Defined in Christina Basin TMDL for Bacteria/Sediment Report*

Source	TMDL Sub Basin	Area (Acre)	Sediment (lbs/yr)	Unit Area Load (lbs/acre/yr)
Residential	B15	136.54	19,460.00	142.52
Agriculture	B1S	663.17	472,700.00	712.79
Open Land	B15	0.00	0.00	0.00
Forest	B15	234.06	11,120.00	47.51
Water	B15	97.53	40.00	0.41
Urban	B15	58.52	8,340.00	142.52
Totals		**1,189.82**	**511,660.00**	

Source	TMDL Sub Basin	Area (Acre)	Sediment (lbs/yr)	Unit Area Load (lbs/acre/yr)
Residential	B31	780.20	111,220.00	142.55
Agriculture	B31	1,365.36	973,180.00	712.76
Open Land	B31	0.00	0.00	0.00
Forest	B31	741.19	35,220.00	47.52
Water	B31	19.51	0.00	0.00
Urban	B31	78.02	11,120.00	142.53
Totals		**2,984.28**	**1,130,740.00**	

*Table Data from Total Maximum Daily Loads for Bacteria and Sediment in the Christina River Basin, Pennsylvania, Delaware, and Maryland. September 2006. U.S. Environmental Protection Agency, Philadelphia, PA. (Appendix C Table C-1. Land Use Areas and Allocations for MS4 Municipalities in Christina River Basin, and Appendix C Table C-5b. Sediment Baseline MS4 Loads in Brandywine Creek Watershed)

Total Existing Sediment Load Defined in Christina Basin TMDL Report (B15+B31) = 1,642,400.00 lbs/yr

Table 2: Allowable Loading (WLA) Defined in Christina Basin TMDL for Bacteria/Sediment Report*

Source	TMDL Sub Basin	Area (Acre)	Sediment (lbs/yr)	Reduction	Allowable Unit Area Load (lbs/acre/yr)
Residential	B15	136.54	7,600.00	60.95%	55.66
Agriculture	B15	663.17	177,840.00	62.38%	268.17
Open Land	B15	0.00	0.00	0.00%	0.00
Forest	B15	234.06	11,120.00	0.00%	47.51
Water	B15	97.53	40.00	0.00%	0.41
Urban	B15	58.52	3,260.00	60.91%	55.71
Totals		**1,189.82**	**199,860.00**		

Source	TMDL Sub Basin	Area (Acre)	Sediment (lbs/yr)	Reduction	Allowable Unit Area Load (lbs/acre/yr)
Residential	B31	780.20	43,440.00	60.94%	55.68
Agriculture	B31	1,365.36	358,680.00	63.14%	262.70
Open Land	B31	0.00	0.00	0.00%	0.00
Forest	B31	741.19	35,220.00	0.00%	47.52
Water	B31	19.51	0.00	0.00%	0.00
Urban	B31	78.02	4,340.00	60.97%	55.63
Totals		**2,984.28**	**441,680.00**		

*Table Data from Total Maximum Daily Loads for Bacteria and Sediment in the Christina River Basin, Pennsylvania, Delaware, and Maryland. September 2006. U.S. Environmental Protection Agency, Philadelphia, PA. (Appendix C Table C-1. Land Use Areas and Allocations for MS4 Municipalities in Christina River Basin, and Appendix C Table C-5a. Sediment MS4 Load Allocations in Brandywine Creek Watershed)

Total Allowable Sediment Load Defined in Christina Basin TMDL Report (B15+B31) = 641,540.00 lbs/yr

Delineation of TMDL Storm Sewershed:

The Christina Basin TMDL for Bacteria/Sediment Report calculated the Sediment WLA for Pocopson Township based upon the entire land area of TMDL sub-basins B15 and B31 located within the Municipal boundaries. The Weighted Land Use Area Method was used by Pocopson Township to reduce/parse the WLA. This methodology is consistent with the recommended approach described in PADEP's TMDL Plan Instructions.

Weighted Land Use Area Method – Within each applicable TMDL subbasin, the TMDL Storm Sewershed Areas were delineated based on 2010 LiDAR topography (2-foot contours). Each Storm Sewershed boundary associated with an MS4 outfall that discharges to TMDL waters was identified, and the MS4 Planning Area was recalculated.

Individual land use areas were determined using 2010 Chester County Land Use data and categorized into the TMDL Land Uses (see Table A), and the existing loads and WLAs were recalculated using the existing and allowable loading rates by land use from the TMDL.

Chester County 2010 Land Use	TMDL Land Uses	TMDL Land Use Sediment Loading Rate
Agricultural	Agricultural	712.79 lbs/acre
Community Services	Residential	142.52 lbs/acre
Community Service Parking		
Recreation		
Recreational Parking		
Single Family Residential		
Utility		
Vacant		
Commercial	Urban	142.52 lbs/acre
Light Manufacturing		
Commercial Parking		
Light Industrial Parking		
Multifamily Parking		
Multifamily Residential		
Water	Water	0.41 lbs/acre
Wooded	Forest	47.51 lbs/acre

* Chester County's 2010 Land Use Data was categorized into the Land Uses defined in EPA's Christina Basin TMDL Report. The associated TMDL Report Land Use Loading Rates were applied accordingly.

Table 3: Recalculated MS4 Existing Load Based on Planning Area

Source	TMDL Sub Basin	Area (Acre)	Sediment (lbs/yr)	Unit Area Load (lbs/acre/yr)
Residential	B15	73.25	10,439.76	142.52
Agriculture	B15	9.21	6,564.78	712.79
Open Land	B15	0.00	0.00	0.00
Forest	B15	11.14	529.25	47.51
Water	B15	0.00	0.00	0.41
Urban	B15	0.47	66.98	142.52
Totals		**94.07**	**17,600.78**	

Source	TMDL Sub Basin	Area (Acre)	Sediment (lbs/yr)	Unit Area Load (lbs/acre/yr)
Residential	B31	246.56	35,147.91	142.55
Agriculture	B31	28.63	20,406.44	712.76
Open Land	B31	0.00	0.00	0.00
Forest	B31	22.64	1,075.81	47.52
Water	B31	0.63	0.00	0.00
Urban	B31	15.54	2,214.88	142.53
Totals		**314.00**	**58,845.05**	

Total Existing Sediment Load Based on Planning Area (B15+B31) =
76,445.83 lbs/yr

Section E – Wasteload Allocation (WLA)

Table 4: Recalculated MS4 Waste Load Allocation (WLA)

Source	TMDL Sub Basin	Area (Acre)	Sediment (lbs/yr)	Reduction	Unit Area Load (lbs/acre/yr)
Residential	B15	73.25	4,077.19	60.95%	55.66
Agriculture	B15	9.21	2,469.81	62.38%	268.17
Open Land	B15	0.00	0.00	0.00%	0.00
Forest	B15	11.14	529.25	0.00%	47.51
Water	B15	0.00	0.00	0.00%	0.41
Urban	B15	0.47	26.18	60.91%	55.71
Totals		**94.07**	**7,102.44**		

Source	TMDL Sub Basin	Area (Acre)	Sediment (lbs/yr)	Reduction	Unit Area Load (lbs/acre/yr)
Residential	B31	246.56	13,727.98	60.94%	55.68
Agriculture	B31	28.63	7,521.10	63.14%	262.70
Open Land	B31	0.00	0.00	0.00%	0.00
Forest	B31	22.64	1,075.81	0.00%	47.52
Water	B31	0.63	0.00	0.00%	0.00
Urban	B31	15.54	864.44	60.97%	55.63
Totals		**314.00**	**23,189.33**		

Total Allowable MS4 Waste Load Allocation Based on Planning Area (B15+B31) =
30,291.77 lbs/yr

Section F – Analysis of TMDL Objectives

1.) Long-Term Reduction

76,445.83 lbs/yr (Total Existing Sediment Load Based on Planning Area)
-30,291.77 lbs/yr (Total Allowable MS4 WLA Based on Planning Area)

=46,154.06 lbs/yr (Pollutant Load Reduction Required to Meet the WLA)

60.37% of Recalculated MS4 Existing Load

2.) Short –Term Reduction

Pocopson Township has elected to pursue a 10% reduction of sediment within the next 5 year permit term, in accordance with PADEP requirements.
10% Reduction of the Total Existing Sediment Load = 7,644.58 lbs/yr

Section G – BMP's to Achieve the Minimum Required Reductions in Pollutant Load

Priorities for Implementation:

BMP/control measure selection has been prioritized within the Implementation Area in the following order:

- First on properties owned by Pocopson that will minimize the volume and rate of stormwater flow discharging from the Regulated Small MS4 and are within the TMDL watershed and the Urbanized Area;
- Second, on non-Municipal properties that will minimize the volume and rate of stormwater flow discharging from the Regulated Small MS4 and are within the TMDL watershed and Urbanized Area;
- Third, on non-Municipal properties within the Urbanized Area that are a source of sediment; and
- Fourth, on any sources outside the Urbanized Area located within the TMDL watershed and targeted to maximize pollutant load reductions, and in accordance with DEP's offset policies.

Pocopson Township will formally establish its responsibilities associated with protecting the permanence of each BMP/control measure implemented for achieving the TMDL Load Reductions presented in this MS4 TMDL Plan, in order to sustain those water quality improvements into the long-term future. This includes establishing the necessary legal and administrative arrangements and instruments to insure that Pocopson Township can fulfill its responsibilities for access, and inspection, maintenance, and operation (I, M & O) of any constructed TMDL BMP/control measure, and protect each measure against future disturbance except as authorized by Pocopson Township. These responsibilities will be established and implemented for each BMP/control measure installation or retrofit for which a Load Reduction is counted by Pocopson Township toward its short term and long term TMDL targets.

All constructed or retrofitted BMP/control measures proposed in this Plan on property not owned by Pocopson Township are subject to the approval and authorization of the property owner. BMP's will be accompanied by the necessary legal and/or administrative arrangements and instruments to establish long term access and

inspection, operation and maintenance responsibilities by Pocopson Township and permanent protection from disturbance or modification except as authorized by Pocopson Township.

Pocopson Township has prepared the following lists of candidate Best Management Practice (BMP) control measures after careful consideration of installation costs, maintenance concerns, and effectiveness. Installation of the type, size and location of the proposed BMPs will ultimately rely on permitting, funding, landowner permissions and public involvement. Changes in the Urbanized Area and Regulated Storm Sewersheds will be addressed as necessary in future permit terms.

The Regulated Storm Sewersheds in Pocopson Township consists primarily of residential subdivisions. The Township owns very little property, greatly limiting the BMPs that present a viable or effective option in reducing the existing sediment loads in the Brandywine Creek Watershed. Thus, the Township intends to initially install BMPs within right-of-ways and storm sewer easements, and will then subsequently need to rely on the permission of property owners to further advance the implementation and attainment schedule. Pocopson's efforts will also focus on the reduction of sediment loads from agricultural land uses, where possible.

To determine the reduction rate of each proposed BMP, existing loading rates (from EPA TMDL Report) are multiplied by the land use area tributary to the BMP and multiplied by the corresponding efficiency (%). BMP tributary areas are based on DCNR Pennsylvania Geological Survey's PAMAP LiDAR Data. Efficiency percentages for each BMP are as listed in the NPDES Stormwater Discharges from Small MS4s BMP Effectiveness Values.

Please note all BMPs are conceptual in nature and are subject to change as the Township moves forward with design details and future cycles of the MS4 permit. The Township aims to have options and flexibility in meeting the minimum goals set forth in the Plan and may consider alternate features and methods to reduce sediment loadings.

Additionally, installation of all proposed BMPs are subject to multiple factors, including permitting, landowner permission and easements, and funding, notably for design, permitting and construction. If Pocopson Township is unable to obtain or secure applicable permits, permissions and funding, the corresponding BMPs will be reviewed and potentially replaced with alternative BMP features and/or locations. Pocopson Township reserves the right to eliminate and/or substitute BMPs as the MS4 Program and TMDL Plan progresses and additional research and information become available to the Township and the Christina Basin TMDL watershed. Pocopson Township anticipates grant opportunities, as they become available.

It should be further noted the Township strives to uphold regulations per their Act 167 Stormwater Ordinance, which exceed NPDES requirements, i.e., stream channel protection requirement, sediment forebays, level spreaders, water quality filters, etc.,

during all grading and building permit and land development reviews. Additionally, Pocopson Township, in coordination with Brandywine Conservancy, is in the process of implementing a Riparian Buffer Ordinance, which will incorporate an overlay district in the Township's Zoning Ordinance requiring 100-foot forested riparian buffers. Further, the Township has a Stream Team Committee, which meets on an as-needed basis, dedicated to the quality and preservation of the Township's many creeks and streams. These ongoing regulating measures for new developments and oversights in the Township are integrated in the Township's overall plan to enhance water quality and reduce pollution throughout the Township's waterways.

Short-Term Reductions for the Permit Term

Table 5 presents BMP/control measure options that may be implemented by Pocopson Township during this 5-year permit cycle. Pocopson Township is reviewing the opportunities to implement these and/or other BMP/control measures at locations where the water quality benefits will be maximized.

Table 5. Pocopson Township - Brandywine Creek Watershed Proposed Short-Term BMP Sediment Reductions (LBS/YR)

BMP Data		Land Use	Land Use Area Tributary to BMP (Acres)	Land Use Loading Rate (LBS/AC/YR)	Reduction (Area x Rate x Efficiency) (LBS/YR)
ID	P-001	Residential	7.75	142.52	552.27
Name	Vegetated Open Channel	Agriculture	1.22	712.79	434.80
Type**	6.4.8	Open Land	0	0.00	0.00
Efficiency %*	50%	Forest	1.82	47.51	43.23
TMDL Subbasin	B15	Water	0	0.41	0.00
Description	Vegetated Open Channel (C/D Soils) to slow and treat runoff from road and storm sewer to reduce sediment load before entering stream.	Urban	0	142.52	0.00
				Total Reduction (BMP) LBS/YR	1,030.31
Location	Leading to and at last inlet before outfall on Red Hawk Trail. Parallel to roadway.				
Date of Implementation	Fall 2019				

BMP Data		Land Use	Land Use Area Tributary to BMP (Acres)	Land Use Loading Rate (LBS/AC/YR)	Reduction (Area x Rate x Efficiency) (LBS/YR)
ID	P-002	Residential	10.99	142.55	783.33
Name	Vegetated Open Channel	Agriculture	0	712.76	0.00
Type**	6.4.8	Open Land	0	0.00	0.00
Efficiency %*	50%	Forest	0	47.52	0.00
TMDL Subbasin	B31	Water	0	0.00	0.00
Description	Vegetated Open Channel (C/D Soils) to slow and treat runoff from road and storm sewer to reduce sediment load before entering stream.	Urban	0	142.53	0.00
				Total Reduction (BMP) LBS/YR	783.33
Location	Adjacent to Haines Mill Road between Brinton Woods and Beversrede Trail.				
Date of Implementation	Fall 2020				

BMP Data			Length of BMP (LF)	BMP Effectiveness Value (LBS/LF/YR)	Reduction (Length x Rate) (LBS/YR)
ID	P-003		300	44.88	13,464.00
Name	Stream Bank Restoration		0	44.88	0.00
Type**			0	44.88	0.00
Efficiency*	44.88 lbs/ft/yr		0	44.88	0.00
TMDL Subbasin	B31		0	44.88	0.00
Description	Stream Bank Restoration to stabilize and vegetate eroded banks.		0	44.88	0.00
				Total Reduction (BMP) LBS/YR	13,464.00
Location	Pocopson Creek, below Pocopson Township Maintenance Building				
Date of Implementation	Summer & Fall 2022				

Total Short-Term Reduction (LBS/YR)	15,277.64

* Pollutant Efficiency Values from PADEP NPDES Stormwater Discharges From MS4 BMP Effectiveness Values (3800-PM-BCW0100m 5/20/2016)

** BMP Type from Pennsylvania Stormwater Best Management Practices Manual

Long-Term Reductions to meet the WLA

Table 6 presents the additional candidate BMPs/control measures that may be implemented by Pocopson Township in order to meet the Township's WLA. Pocopson Township is reviewing the opportunities to implement these and/or other BMP/control measures at locations where the water quality benefits will be maximized.

Table 6. Pocopson Township - Brandywine Creek WatershedProposed Long-Term BMP Sediment Reductions (LBS/YR)

BMP Data		Land Use	Land Use Area Tributary to BMP (Acres)	Land Use Loading Rate (LBS/AC/YR)	Reduction (Area x Rate x Efficiency) (LBS/YR)
ID	P-004	Residential	2.47	142.55	193.66
Name	Raingarden	Agriculture	0	712.76	0.00
Type**	6.4.5	Open Land	0	0.00	0.00
Efficiency %*	55%	Forest	0	47.52	0.00
TMDL Subbasin	B31	Water	0	0.00	0.00
Description	Raingarden (C/D soils) with underdrain to slow and treat runoff from roadway discharging to outfall.	Urban	0	142.53	0.00
				Total Reduction (BMP) LBS/YR	193.66
Location	East Lafayette in Public ROW at inlet above Outfall 250				
Date of Implementation	Fall 2024				

BMP Data			Length of BMP (LF)	BMP Effectiveness Value (LBS/LF/YR)	Reduction (Length x Rate) (LBS/YR)
ID	P-005		300	44.88	13,464.00
Name	Stream Bank Restoration		0	44.88	0.00
Type**			0	44.88	0.00
Efficiency*	44.88 lbs/ft/yr		0	44.88	0.00
TMDL Subbasin	B31		0	44.88	0.00
Description	Stream Bank Restoration to stabilize and vegetate eroded banks.		0	44.88	0.00
				Total Reduction (BMP) LBS/YR	13,464.00
Location	Clearview Drive, between Lenni and Lenape Roads				
Date of Implementation	Summer & Fall 2026				

BMP Data		Land Use	Land Use Area Tributary to BMP (Acres)	Land Use Loading Rate (LBS/AC/YR)	Reduction (Area x Rate x Efficiency)(LBS/YR)
ID	P-006	Residential	24.87	142.55	1,772.65
Name	Riparian (Forest) Buffer	Agriculture	8.86	712.76	3,157.55
Type**	6.7.1	Open Land	0	0.00	0.00
Efficiency %*	50%	Forest	1.93	47.52	45.86
TMDL Subbasin	B31	Water	0.63	0.00	0.00
Description	Tree plantings on one side of streambank below agricultural area runoff to maintain the integrity of the stream channel and trap pollutants.	Urban	0	142.53	0.00
				Total Reduction (BMP) LBS/YR	4,976.05
Location	35' x 1460' Riparian Buffer (West side of Tributary) adjacent to Red Bridge Farms Subdivision.				
Date of Implementation	Fall 2028				

BMP Data			Length of BMP (LF)	BMP Effectiveness Value (LBS/LF/YR)	Reduction (Length x Rate) (LBS/YR)
ID	P-007		200	44.88	8,976.00
Name	Stream Bank Restoration		0	44.88	0.00
Type**			0	44.88	0.00
Efficiency *	44.88 lbs/ft/yr		0	44.88	0.00
TMDL Subbasin	B31		0	44.88	0.00
Description	Stream Bank Restoration to stabilize and vegetate eroded banks.		0	44.88	0.00
				Total Reduction (BMP) LBS/YR	8,976.00
Location	Adjacent to Haines Mill Road between Brinton Woods and Beversrede Trail.				
Date of Implementation	Summer 2029				

BMP Data			Length of BMP (LF)	BMP Effectiveness Value (LBS/LF/YR)	Reduction (Length x Rate) (LBS/YR)
ID	P-008		100	44.88	4,488.00
Name	Stream Bank Restoration		0	44.88	0.00
Type**			0	44.88	0.00
Efficiency *	44.88 lbs/ft/yr		0	44.88	0.00
TMDL Subbasin	B15		0	44.88	0.00
Description	Stream Bank Restoration to stabilize and vegetate eroded banks.		0	44.88	0.00
				Total Reduction (BMP) LBS/YR	4,488.00
Location	604 W. Creek Road, above culvert.				
Date of Implementation	Summer & Fall 2032				

Total Long-Term Reduction (LBS/YR)	32,097.71

Grand Total Reduction (Short-Term & Long-Term BMP's) (LBS/YR)	47,375.35

* Pollutant Efficiency Values from PADEP NPDES Stormwater Discharges From MS4 BMP Effectiveness Values (3800-PM-BCW0100m 5/20/2016)

** BMP Type from Pennsylvania Stormwater Best Management Practices Manual

For each BMP/control measure listed in Tables 5 and 6, an overall location map showing the proposed BMP's and the watersheds tributary to each BMP has been provided in Appendix D. In subsequent permit cycles all BMPs/control measures implemented from Tables 5 & 6 will be counted towards the MS4 TMDL milestones.

Section H – Funding Mechanisms

Estimated costs associated with each BMP, as well as potential funding sources and potential project sponsors are included in Table 7.

Table 7. Pocopson Township - Brandywine Creek Watershed BMP Estimated Costs and Potential Funding

BMP Data					
ID	Type	TMDL Subbasin	Estimated Cost (design, permitting, construction)	Potential Funding Sources	Potential Project Sponsors/Partners
P-301	Vegetated Open Channel	B15	$11,000.00	Stormwater/Watershed Grants Township General Funds	
P-302	Vegetated Open Channel	B15	$11,000.00	Stormwater/Watershed Grants Township General Funds	
P-303	Stream Bank Restoration	B15	$126,000.00	Stormwater/Watershed Grants Township General Funds	Brandywine Conservancy Brandywine Red Clay Alliance Township Volunteers
P-304	Raingarden	B15	$9,000.00	Stormwater/Watershed Grants Township General Funds	Brandywine Conservancy Brandywine Red Clay Alliance
P-305	Stream Bank Restoration	B15	$145,000.00	Stormwater/Watershed Grants Township General Funds	Brandywine Conservancy Brandywine Red Clay Alliance Township Volunteers
P-306	Riparian (Forest) Buffer	B15	$15,000.00	Tree Fund Stormwater/Watershed Grants Township General Funds	Brandywine Conservancy Brandywine Red Clay Alliance Township Volunteers
P-307	Stream Bank Restoration	B15	$90,000.00	Stormwater/Watershed Grants Township General Funds	Brandywine Conservancy Brandywine Red Clay Alliance Township Volunteers
P-308	Stream Bank Restoration	B15	$45,000.00	Stormwater/Watershed Grants Township General Funds	Brandywine Conservancy Brandywine Red Clay Alliance Township Volunteers

Section I – Responsible Parties for Operation & Maintenance (O&M) of BMP's

Operations and Maintenance (O&M) activities associated with each BMP, as well as the anticipated party responsible for O&M of each BMP is included in Appendix E, Table 8.

Section J – Key Definitions

Definitions from Sample PAG-13 (6/2016) "Authorization to Discharge"

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce pollutant loading to surface waters of this Commonwealth. The term includes treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. The term includes activities, facilities, measures, planning or procedures used to minimize accelerated erosion and sedimentation and manage stormwater to protect, maintain, reclaim and restore the quality of waters and the existing and designated uses of waters within this Commonwealth before, during and after earth disturbance activities. (25 Pa. Code § 92a.2)

Load Allocation means the portion of a surface water's loading capacity that is assigned or allocated to existing and future nonpoint sources and natural quality. (25 Pa. Code § 96.1)

Municipal separate storm sewer means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters; (ii) Designed or used for collecting or conveying stormwater; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2. (25 Pa. Code § 92a.32(a) and 40 CFR § 122.26(b)(8))

Municipal Separate Storm Sewer System (MS4) means all separate storm sewers that are defined as "large" or "medium" or "small" municipal separate storm sewer systems pursuant to 40 CFR §§ 122.26(b)(4), (b)(7), and (b)(16), respectively, or designated under 40 CFR § 122.26(a)(1)(v). (25 Pa. Code § 92a.32(a) and 40 CFR § 122.26(b)(18))

Outfall means a point source as defined by 40 CFR § 122.2 at the point where a municipal separate storm sewer discharges to surface waters and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other surface waters and are used to convey surface waters. (25 Pa. Code § 92a.32(a) and 40 CFR § 122.26(b)(9))

Pollutant means any contaminant or other alteration of the physical, chemical, biological, or radiological integrity of surface water which causes or has the potential to cause pollution as

defined in section 1 of the Pennsylvania Clean Streams Law, 35 P.S. § 691.1. (25 Pa. Code § 92a.2)

Regulated Small MS4 means any small MS4 that is covered by the federal Phase II stormwater program, either through automatic nationwide designation under 40 CFR § 122.32(a)(1) (via the Urbanized Area criteria) or by designation on a case-by-case basis by DEP pursuant to 40 CFR § 122.32(a)(2). "Regulated small MS4s" are a subset of "small MS4s" as defined in this section.

Riparian Forest Buffer means an area of permanent vegetation consisting of native trees, shrubs, forbs and grasses along surface water that is maintained in a natural state or sustainably managed to protect and enhance water quality, stabilize stream channels and banks, and buffer land use activities from surface waters.

Small Municipal Separate Storm Sewer System (Small MS4) means an MS4, as defined in this section, that is not a large or medium MS4 pursuant to 40 CFR §§ 122.26(b)(4) and 122.26(b)(7). The term small MS4 includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings. (25 Pa. Code § 92a.32(a) and 40 CFR § 122.26(b)(16))

Storm Sewershed means the land area that drains to an individual MS4 outfall from within the jurisdiction of the MS4 permittee. The term "combined storm sewershed" means the drainage areas of all MS4 outfalls that discharge to a specific surface water or to waters within the Chesapeake Bay watershed.

Stormwater means runoff from precipitation, snow melt runoff and surface runoff and drainage. "Stormwater" has the same meaning as "storm water." (25 Pa. Code § 92a.2)

Structural BMPs means stormwater storage and management practices including, but not limited to, wet ponds and extended detention outlet structures; filtration practices such as grassed swales, sand filters and filter strips; infiltration practices such as infiltration basins and infiltration trenches; and other BMPs as referenced in Chapter 6 of the Pennsylvania Stormwater BMP Manual (363-0300-002).

Surface Waters means perennial and intermittent streams, rivers, lakes, reservoirs, ponds, wetlands, springs, natural seeps and estuaries, excluding water at facilities approved for wastewater treatment such as wastewater treatment impoundments, cooling water ponds and constructed wetlands used as part of a wastewater treatment process. (25 Pa. Code § 92a.2)

Total Maximum Daily Load (TMDL) means the sum of individual waste load allocations for point sources, load allocations for nonpoint sources and natural quality and a margin of safety expressed in terms of mass per time, toxicity or other appropriate measures. (25 Pa. Code § 96.1)

Urbanized Area (UA) means land area comprising one or more places (central place(s)) and the adjacent densely settled surrounding area (urban fringe) that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile, as defined by the United States Bureau of the Census and as determined by the latest available decennial census. The UA outlines the extent of automatically regulated areas.

Wasteload Allocation (WLA) means the portion of a surface water's loading capacity that is allocated to existing and future point source discharges. (25 Pa. Code § 96.1)