

Pollution Reduction Plan
For
Municipal Separate Storm Sewer System

West Chester University of Pennsylvania
September 2017

Table of Contents

Purpose and Scope

Permit Requirements

Pollution Reduction

1. Public Participation
2. Sewershed Map
3. Pollutants of Concern
4. Determine Existing Loading for Pollutants of Concern
5. Select BMPs to Achieve the Minimum Required Reductions in Pollutant Loading
6. Identify Funding Mechanisms
7. Identify Responsible Parties for Operation and Maintenance of BMPs

Conclusion

Appendix A- MS4 Requirement Table

Appendix B- Public Notice, Comments, Record of Consideration

Appendix C- Sewershed Map

Appendix D- County Loading Rates, Watershed Load Calculations

Appendix E- BMP Effectiveness Values

Purpose and Scope

West Chester University has developed a Pollution Reduction Plan (PRP) for its Municipal Separate Storm Sewer System (MS4) in accordance with the requirements of the *National Pollutant Discharge Elimination System (NPDES) Stormwater Discharges From Small Municipal Separate Storm Sewer Systems Pollution Reduction Plan Instructions* as required by the *PAG-13 Authorization to Discharge Under the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4)*. WCU has created a PRP to address discharges to from our MS4 affecting the siltation impairments in Plum Run of the Brandywine Creek Watershed and pathogen and siltation impairments in Chester Creek as identified by the *MS4 Requirements (Non-Municipal) Anticipated Obligations for the Subsequent NPDES Permit Term* table revised 6/24/16 as seen in [Appendix A](#).

The purpose of the PRP is to determine the University's existing pollutant load discharged to Plum Run of the Brandywine Creek Watershed and Chester Creek in order to develop stormwater Best Management Practices (BMPs) to be implemented over the next five year MS4 permit term, beginning March 16, 2018 and concluding on March 15, 2023, to reduce waterway pollutants of concern by minimum reduction percentages required by the Pennsylvania Department of Environmental Protection (PADEP). The University's PRP will be evaluated and may be amended over the permit term in order to meet the goal reductions.

Permit Requirements

Elements of the Pollution Reduction Plan

As stated in the *NPDES Stormwater Discharges from Small Municipal Separate Storm Sewer Systems Pollutant Reduction Plan Instruction* each PRP is required to include the following elements:

- 1) Public Participation
- 2) Map
- 3) Storm Sewershed Pollutants of Concern
- 4) Determine Existing Loading for Pollutants of Concern
- 5) Select BMPs to Achieve the Minimum Required Reductions in Pollutant Loading
- 6) Identify Funding Mechanisms
- 7) Identify Responsible Parties for Operations and Maintenance of BMPs

West Chester University's PRP addresses the requirements in the order as listed above. Relevant PRP instructions for each element have been included as bulleted item.

1. Public Participation

- The University shall make a complete copy of the PRP available for public review
- The University 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 University 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 PRP to the DEP. **Include a copy of the public notice with the PRP.**

- The University shall accept written comments for a minimum of 30 days from the date of public notice. **Include a copy of all written comments received from the public with the PRP.**
- The University 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.
- The University shall consider and make a record of the consideration of each timely comment received from the public during
- The University 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. **Include a copy of the Township's record of consideration of all timely comments received in the public comment period with the PRP.**

West Chester University's PRP public notice was published on 8/15/17 in The Daily Local Newspaper and PRP was made available online for public review and comment on 8/17/17 at www.wcupa.edu/facilities and in person at **West Chester University's Environmental Health and Safety Office**. The public was given thirty days to comment on the PRP. A public meeting to address the PRP was held on 9/7/17.

[A copy of the Public Notice, timely comments, and records of consideration are located in Appendix B.](#)

2. Sewershed Map

- Attach maps that identify **land uses** and the **storm sewershed boundaries** associated with the MS4 that discharge to impaired surface waters, and calculate the storm sewershed area that is subject to Appendix E of PAG-13. In addition, the proposed location(s) of structural BMP(s) that will be implemented to achieve the required pollutant load reductions must be identified on a map.
- The map may be the same as that used to satisfy MCM #3 of the PAG-13 General or Individual Permit, with the addition of land use, the storm sewershed boundary, and locations of proposed BMPs, or may be a different map. The map must be sufficiently detailed to identify the PRP Planning Area relevant to satisfying the requirements of Appendix E, and to demonstrate that BMPs will be located in appropriate storm sewersheds to meet the requirements.

West Chester University's municipal separate sewershed covers 404.69 Acres located within the West Chester Borough, West Goshen Township, East Bradford Township, and the Township of Westtown within Chester County. Within the Brandywine Creek watershed, 315.84 Acres (80.79%) of the campus is pervious and 75.11 Acres (19.21%) are impervious. 13.74 Acres of the campus fall within the Chester Creek Watershed, 5.22 acres (38.02%) are pervious and 8.52 acres (61.98%) are impervious. The University has 16 outfalls total, 5 are located on the University's North Campus and 11 are located on its South Campus.

West Chester University Impervious and Pervious Area Totals by Watershed			
	Impervious Area	Pervious Area	Total
Brandywine Creek Watershed	75.11	315.84	390.95
Chester Creek Watershed	8.52	5.22	13.74
West Chester University Total	83.63 Acres	321.06 Acres	404.69 Acres

135 acres within the Brandywine Creek Watershed on WCU's South Campus are protected natural lands called the Gordon Natural Area for Environmental Studies. Plum Run flows through the Gordon Natural Area which is home to trees, plants, and wildlife. The Gordon Natural Area provides many learning and volunteer opportunities to WCU students and the surrounding community.

As per PA DEP PRP requirements, maps identifying land use, storm sewershed boundaries, and proposed locations of structural BMPs required to achieve the required pollutant load reductions are attached in [Appendix C](#).

3. Pollutants of Concern

- Identify the pollutants of concern for each storm sewershed or the overall PRP Planning Area.
- The term "nutrients" refers to "Total Nitrogen" (TN) and "Total Phosphorus" (TP) unless specifically stated otherwise in DEP's latest Integrated Report. The terms "sediment," "siltation," and "suspended solids" all refer to inorganic solids and are hereinafter referred to as "sediment."
- The term, "storm sewershed" is defined in the PAG-13 General Permit as the land area that drains to the municipal separate storm sewer from within the jurisdiction of the MS4 permittee. This term is used in these instructions as well as the term "PRP Planning Area" (or "Planning Area"), which refers to all of the storm sewersheds that an MS4 must calculate existing loads and plan load reductions for.
- For all PRPs, MS4s shall calculate existing loading of the pollutant(s) of concern in lb/year; calculate the minimum reduction in loading in lb/year; select Best Management Practice(s) (BMP(s)) to reduce loading; and demonstrate that the selected BMPs will achieve the minimum reductions.
- For PRPs developed for Appendix E, impaired waters, the pollutant(s) are based on the impairment listing, as provided in the MS4 Requirements Table. If the impairment is based on siltation only, a minimum 10% sediment reduction is required. If the impairment is based on nutrients only or other surrogates for nutrients (e.g., "Excessive Algal Growth" and "Organic Enrichment/Low D.O."), a minimum 5% TP reduction is required. If the impairment is due to both siltation and nutrients, both sediment (10% reduction) and TP (5% reduction) must be addressed. PRPs may use a presumptive approach in which it is assumed that a 10% sediment reduction will also accomplish a 5% TP reduction. However, MS4s may not presume that a reduction in nutrients will accomplish a commensurate reduction in sediment.

As identified in the *MS4 Requirements (Non-Municipal) Anticipated Obligations for the Subsequent NPDES Permit Term* table, West Chester University will implement BMPs to improve the siltation impairment of Plum Run within the Brandywine Creek Watershed and the siltation and pathogen impairment of Chester Creek.

4. Determine Existing Loading for Pollutants of Concern

- Identify the date associated with the existing loading estimate. Calculate the existing loading, in lbs. per year, for the pollutant(s) of concern in the PRP Planning Area.
- There are several possible methods to estimate existing loading, ranging from simplistic to complex. One method to estimate existing loading that is acceptable to DEP is to determine the percent impervious and pervious surface within the urbanized area of the storm sewershed and calculate existing loading by multiplying the developed impervious and developed pervious land areas (acres) by pollutant loading rates (lb/acre/year) (“simplified method”). The MS4 may use loading rates for undeveloped land for areas outside of the urbanized area which flows into the urbanized area. Where structural BMPs are currently in place and are functioning, the existing loading estimate may be reduced to account for pollutant reductions from those BMPs.
- Use of DEP’s simplified method is not required. Any methodology that calculates existing pollutant loading in terms of lbs. per year, evaluates BMP-based pollutant reductions utilizing the BMP effectiveness values contained in 3800-PM-BCW0100m or Chesapeake Bay Program expert panel reports, uses average annual precipitation conditions, considers both overland flow and stream erosion, and is based on sound science may be considered acceptable.
- Whatever tool or approach that is used to estimate existing loading from the PRP Planning Area must also be used to estimate existing loading to planned BMPs. This avoids errors in percent pollutant removal calculations that would result if different methods were used. Later BMP design efforts will usually apply a more sophisticated method than used in planning to calculate load to a BMP. The design loading may not however be used to alter the assumed pollutant reduction by the BMP unless the PRP is revised to apply the more sophisticated method to the load from the storm sewershed as a whole.
- MS4s may claim “credit” for structural BMPs implemented prior to development of the PRP to reduce existing loading estimates. In order to claim credit, identify all such structural BMPs in Section D of the PRP 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 demonstrating 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 and O&M frequencies associated with the BMP.

- The MS4 permittee may optionally submit design drawings of the BMP for previously installed or future BMPs with the PRP.
- Existing loading must be calculated and reported for the portion of the Planning Area which drains to impaired waters as of the date of the development of the PRP. MS4s may not claim credit for street sweeping and other non-structural BMPs implemented in the past, and an MS4 may not reduce its obligations for achieving permit term pollutant load reductions through previously installed BMPs. If structural BMPs were implemented prior to development of the PRP and continue to be operated and maintained, the MS4 may claim pollutant reduction credit in the form of reduced existing loading.
- An MS4 may use all BMPs installed prior to the date of the load calculation to reduce its estimate of existing pollutant loading. For example, if a rain garden was installed ten years ago and is expected to remove 100 lbs. of sediment annually, and the overall annual loading of sediment in the storm sewershed is estimated to be 1,000 lbs. without specifically addressing the rain garden, an MS4 may not claim that the rain garden satisfies its obligations to reduce sediment loading by 10%. The MS4 may, however, use the rain garden to demonstrate that the existing load is 900 lbs. instead of 1,000 lbs., and that 90 lbs. rather than 100 lbs. needs to be reduced during the term of permit coverage.
- Each impairment identified on the MS4 Requirements Table (“Table”) must be addressed in a PRP document. The Table listings for each MS4 are different because they reflect local conditions, which is why an MS4 must carefully interpret the information on the Table.
- For PRPs developed for impaired waters (Appendix E), the pollutant(s) are based on the impairment listing, as provided in the MS4 Requirements Table. If the impairment is based on siltation only, a minimum 10% sediment reduction is required. If the impairment is based on nutrients only or other surrogates for nutrients (e.g., “Excessive Algal Growth” and “Organic Enrichment/Low D.O.”), a minimum 5% TP reduction is required. If the impairment is due to both siltation and nutrients, both sediment (10% reduction) and TP (5% reduction) must be addressed. PRPs may use a presumptive approach in which it is assumed that a 10% sediment reduction will also accomplish a 5% TP reduction. However, MS4s may not presume that a reduction in nutrients will accomplish a commensurate reduction in sediment.
- All MS4s must use the BMP effectiveness values contained within DEP’s BMP Effectiveness Values document (3800-PM-BCW0100m) or Chesapeake Bay Program expert panel reports for BMPs listed in those resources when determining pollutant load reductions in PRPs, except as otherwise approved by DEP. An example of other approaches that may be approved by DEP include the use of thoroughly vetted mechanistic models with self-contained BMP modules (e.g., Storm Water Management Model (SWMM), WinSLAMM) to demonstrate achievement of reduction targets. Application of these data intensive models could allow for a streamlining of the planning and design phases of BMPs that may provide future cost savings as municipalities move toward implementation of the plan. Such resources must be documented in the PRP, and must reflect both overland flow and in-stream erosion components.

The University's existing sediment load and required ten percent reduction was calculated using *Attachment B: Developed Land Loading Rates For PA Counties* and *Attachment C: The Chesapeake Bay PRP Example Using DEP Simplified Method of the National Pollutant Discharge Elimination System (NPDES) Stormwater Discharges From Small Municipal Separate Storm Sewer Systems Pollution Reduction Plan Instructions*. [The Chester County loading rates and watershed calculations may be found in Appendix D.](#)

Brandywine Creek Watershed

West Chester University is required by the PA DEP to reduce sediment impairment from stormwater discharges to the waters of Plum Run in the Brandywine Creek Watershed by ten percent over the five year permit term.

Brandywine Creek Watershed Existing Sediment Load Calculation				
	Percentage	Acres	Loading Rate	Total
Impervious	19.21 %	75.11 Acres	1504.78 lbs/acre/year	113,028.22 lbs/yr
Pervious	80.79 %	315.84 Acres	185.12 lbs/acre/year	58,467.87 lbs/yr
Existing Sediment Load				171, 496 lbs/yr

Brandywine Creek Watershed Required Sediment Reduction Calculation		
Total Sediment Load Total	Reduction Multiplier	Reduction Total
171, 496 lbs/yr	.10	17,149.09 lbs/yr

Chester Creek Watershed

West Chester University is required to reduce sediment impairments from stormwater discharges to Chester Creek by ten percent and implement PADEP required controls for Pathogen impairments over the five year permit term.

Chester Creek Watershed Existing Sediment Load Calculation				
	Percentage	Acres	Loading Rate	Total
Impervious	21.15 %	8.52 Acres	1504.78 lbs/acre/year	12,816.64 lbs/yr
Pervious	14.09 %	5.22 Acres	185.12 lbs/acre/year	967.04 lbs/yr
Existing Sediment Load				13,783.68 lbs/yr

Chester Creek Watershed Required Sediment Reduction Calculation		
Total Sediment Load Total	Reduction Multiplier	Reduction Total
13,783.68 lbs/yr	.10	1,378.37 lbs/yr

The University will implement the PADEP required pollution control measures as stated in *Appendix B of PAG-13 General Permit* due to pathogen impairment of Chester Creek over the permit term.

1. Map- WCU must develop a map of the storm sewershed associated with all outfalls that flow to Chester Creek by September 30th, 2019.
2. Inventory- Develop an inventory of all suspected and known sources of bacteria in stormwater within the storm sewershed by September 30th, 2020.
3. Investigate- Complete an investigation of each suspected bacteria source and include stormwater sampling if required under Illicit Discharge Detection & Elimination Program by September 2022.
4. Ordinance- Enforce ordinances that prohibit illicit and illegal connections and discharges of sewage into the MS4. All illicit and illegal connections and discharges of sewage must be reported in Annual Ms4 Status Report along with corrective actions.
5. Standard Operating Procedure- WCU must enact a standard operating procedure that requires proper management of animal wastes on property owned by the University.
6. Documentation- The progress of investigations and source control efforts of pathogens must be documented in the Annual MS4 Status Reports.

5. Select BMPs to Achieve the Minimum Required Reductions in Pollutant Loading

- Identify the minimum required reductions in pollutant loading. Applicants must propose the implementation of BMP(s) or land use changes within the PRP Planning Area that will result in meeting the minimum required reductions in pollutant loading within the Planning Area. These BMP(s) must be implemented within 5 years of DEP's approval of coverage under the PAG-13 General Permit or an individual permit, and may be located on either public or private property.
- If the applicant is aware of BMPs that will be implemented by others (either in cooperation with the applicant or otherwise) within the Planning Area that will result in net pollutant loading reductions, the applicant may include those BMPs within its PRP.
- Historic street sweeping practices should not be considered in calculating credit for future practices. All proposed street sweeping practices may be used for credit if the minimum standard is met for credit (see 3800-PM-BCW0100m). In other words, if sweeping was conducted 1/month and will be increased to 25/year in the future, the MS4 does not need to use the "net reduction" resulting from the increased sweeping; it may take credit for the full amount of reductions from 25/year sweeping.
- The names and descriptions of BMPs and land uses reported in the PRP should be in accordance with the Chesapeake Bay Program Model. The names and descriptions are available through CAST (log into www.casttool.org, select "Documentation," select "Source Data" and see worksheets named "Land Use Definitions" and "BMP Definitions").
- Opportunities for BMP installation vary across a municipality, and for that reason MS4s with multiple PRP obligations need not propose BMPs to address each impairment listed in the Table

during the permit term. The existing loading must be calculated for the entire PRP Planning Area which drains to impaired waters, but pollutant controls to be installed during the subsequent permit term may be located such that they reduce the load in one sub-watershed by less than 10% and by more than 10% in another (as long as the overall amount of lbs. reduced constitutes 10% of the existing loading for the entire PRP Planning Area).

- MS4s may propose and take credit for only those BMPs that are not required to meet regulatory requirements or otherwise go above and beyond regulatory requirements. For example, a BMP that was installed to meet Chapter 102 NPDES permit requirements for stormwater associated with construction activities may not be used to meet permit term minimum pollutant reductions unless the MS4 can demonstrate that the BMP exceeded regulatory requirements; if this is done, the MS4 may take credit for only those reductions that will occur as a result of exceeding regulatory requirements.

Brandywine Creek Watershed

West Chester University will implement 400 feet of Stream Restoration along Plum Run in the Gordon Natural Area to address the siltation impairment in the Brandywine Creek Watershed. Per the *National Pollutant Discharge Elimination System (NPDES) Stormwater Discharges From Small Municipal Separate Storm Sewer Systems BMP Effectiveness Values*, as seen in [Appendix E](#), Stream Restoration removes 44.88 lbs/ft/yr. The stream restoration will exceed the required 10 percent reduction of 17,149.61 lbs/yr. Calculations may be seen below.

Stream Restoration Reduction Calculation		
BMP Effectiveness Value	Length of Stream Restoration	Total Sediment Reduction
44.88 lbs/ft/yr	400 ft	17,952 lbs/yr

Brandywine Creek Watershed Sediment Reductions	
Existing Load	171,496.09 lbs/year
Percent Reduction	10 %
Required Reduction	17,149.61 lbs/year
Proposed Reduction	17,952 lbs/year

Chester Creek Watershed

West Chester University will alter the existing retention basin on 887 Matlack Street within its property within the Chester Creek Watershed. The retention basin will be converted to an infiltration basin with sand/vegetation. Infiltrations facilities with sand, vegetation effectiveness value may be found Appendix E. The converted basin will exceed the required 10 percent reduction of 1,378.37 lbs/yr.

Chester Creek Watershed Sediment Reductions	
Existing Load	13,783.68 lbs/year
Percent Reduction	10 %
Required Reduction	1,378.37 lbs/year
Proposed Reduction	2,012 lbs/year

6. Funding Mechanisms

- Prior to approving coverage DEP will evaluate the feasibility of implementation of an applicant's PRP. Part of this analysis includes a review of the applicant's proposed method(s) by which BMPs will be funded. Applicants must identify all project sponsors and partners and probable funding sources for each BMP.

West Chester University will allocate \$50,000 for the stream restoration in Brandywine Creek Watershed and \$25,000 for the infiltration basin in the Chester Creek Watershed from West Chester University's Facilities Operations budget to complete the stream restoration project.

7. Responsible Parties for Operation and Maintenance of BMPs

- Once implemented, the BMPs must be maintained in order to continue producing the expected pollutant reductions. Applicants must identify the following for each selected BMP:
 - The 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.
- MS4 permittees will need to identify actual O&M activities in Annual MS4 Status Reports submitted under the General Permit.

West Chester University will operate, maintain, and inspect the implemented BMPs in accordance to the latest Pennsylvania Stormwater BMP Manual in order to achieve the anticipated reductions.

Appendix A
MS4 Requirement Table (Non-municipal) Anticipated Obligations for Subsequent NPDES Permit Term

MS4 Name	NPDES ID	Individual Permit Required?	Reason	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment
Chester County						
West Chester University	PAG130169	No		Brandywine Creek	Appendix E-Siltation (4a)	
				Chester Creek	Appendix B-Pathogens (5), Appendix E-Siltation (5)	Cause Unknown (4a), Cause Unknown (5), Flow Alterations, Water/Flow Variability (4c)
				Plum Run	Appendix E-Siltation (4a)	Water/Flow Variability (4c)

West Chester University Public Notice

PUBLIC NOTICE

In accordance with the National Pollutant Discharge Elimination System (NPDES) Municipal Storm Sewer System (MS4) permit requirements, West Chester University (WCU) has prepared a MS4 Strategic Report and Pollutant Reduction Plan (PRP). The plan details the scheduled implementation of a series of Best Management Practices in an effort to improve water quality in the waterways of The University: Brandywine Creek, Chester Creek and Plum Run. Notice is hereby given that beginning August 17, 2017, the plan will be available on WCU Facilities website, www.wcupa.edu/facilities and a hardcopy may be reviewed in person at the Environmental Health & Safety Office, 201 Carter Drive, Suite 100, West Chester, PA during business hours. This **30-Day Public Comment Period** is an opportunity for members of the public to read and comment on the draft MS4 Strategic Report and PRP. The University will accept written comments by submission to James Lewis, Assistant Vice President of Facilities Design and Construction, 201 Carter Drive, West Chester, PA, 19383. The community is also invited to a **public meeting on September 7, 2017, 6:00 PM** at West Chester University's Business and Public Management Center, 50 Sharpless Street, RM 212.

PUBLIC COMMENTS

RECORD OF CONSIDERATION

Appendix C
Sewershed Map

Sewershed map showing land use, boundaries, and proposed location of BMPs are available on WCU Facilities website, www.wcupa.edu/facilities ALERTS and a hardcopy may be reviewed in person at the Environmental Health & Safety Office, 201 Carter Drive, Suite 100, West Chester, PA during business hours.

Appendix D
Determining Existing Load

Chester County Loading Rates

3800-PM-BCW0100k 5/2016
PRP Instructions

ATTACHMENT B

DEVELOPED LAND LOADING RATES FOR PA COUNTIES^{1,2,3}

County	Category	Acres	TN lbs/acre/yr	TP lbs/acre/yr	TSS (Sediment) lbs/acre/yr
Chester	impervious developed	1,838.4	21.15	1.46	1,504.78
	pervious developed	10,439.8	14.09	0.36	185.12

Brandywine Creek Watershed Sediment Load Calculations

Brandywine Creek Watershed Load Calculation				
Impervious and Pervious Ratio				
	Feet	Acres	Percentage	
Impervious	3271913	75.11	19.21%	
Pervious	13757890	315.84	80.79%	
Total	17029803	390.95	1	
Chester County Loading Rate				
Chester County	TN	TP	TSS	(lbs/acre/year)
Impervious Developed	21.15	1.46	1504.78	
Pervious	14.09	0.36	185.12	
Existing Sediment Load				
Brandywine Creek Impervious	113028.22		(75.11 x 1504.78)	
Brandywine Creek Pervious	58467.87		(315.84 x 185.12)	
Total Sediment Load	171496.09			
Brandywine Creek Sediment Reduction				
Total Sediment Load	x .10			
Reduction	17149.61			

Chester Creek Watershed Sediment Load Calculations

Chester Creek Sediment Load Calculation				
Impervious and Pervious Ratio				
	Feet	Acres	Percentage	
Impervious	371,013	8.52	61.98%	
Pervious	227551	5.22	38.02%	
Total	598,564	13.74	100%	
Chester County Loading Rate				
Chester County	TN	TP	TSS	(lbs/acre/year)
Impervious Developed	21.15	1.46	1504.78	
Pervious	14.09	0.36	185.12	
Existing Sediment Load				
Chester Creek Impervious	12816.64		(8.52 x 1504.78)	
Chester Creek Pervious	967.04		(5.22 x 185.12)	
Total Sediment Load	13783.68			
Chester Creek Sediment Reduction				
Total Sediment Load	x .10			
Reduction	1378.37			

Appendix E
BMP Effectiveness Value

Stream Restoration Effectiveness Value

3800-PM-BCW0100m 5/2016
BMP Effectiveness Values

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Stream Restoration	0.075 lbs/ft/yr	0.068 lbs/ft/yr	44.88 lbs/ft/yr	An annual mass nutrient and sediment reduction credit for qualifying stream restoration practices that prevent channel or bank erosion that otherwise would be delivered downstream from an actively enlarging or incising urban stream. Applies to 0 to 3rd order streams that are not tidally influenced. If one of the protocols is cited and pounds are reported, then the mass reduction is received for the protocol.

Chester Creek BMP Effectiveness Value

3800-PM-BCW0100m 5/2016
BMP Effectiveness Values

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Infiltration Practices w/ Sand, Veg.	85%	85%	95%	A depression to form an infiltration basin where sediment is trapped and water infiltrates the soil. No underdrains are associated with infiltration basins and trenches, because by definition these systems provide complete infiltration. Design specifications require infiltration basins and trenches to be built in good soil, they are not constructed on poor soils, such as C and D soil types. Engineers are required to test the soil before approval to build is issued. To receive credit over the longer term, jurisdictions must conduct yearly inspections to determine if the basin or trench is still infiltrating runoff.