DRAFT
Pollutant Reduction Plan

For

NETHER PROVIDENCE TOWNSHIP

Prepared By:

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DEFINITIONS AND ACRONYMS

BMP.....	Best management practice
DEP.....	Pennsylvania Department of Environmental Protection
DVRPC.....	Delaware Valley Regional Planning Commission
lb.....	Pound
MCM.....	Minimum Control Measures
MS4.....	Small Municipal Separate Storm Sewer System
NPDES.....	National Pollutant Discharge Elimination System
O&M.....	Operation and Maintenance
PRP.....	Pollutant Reduction Plan
TN.....	Total Nitrogen
Township.....	Nether Providence Township
TP.....	Total Phosphorous
TSS.....	Total Suspended Solids
USDA.....	United States Department of Agriculture
yr.....	Year

INTRODUCTION

This PRP is a component of the Township's NPDES Permit to discharge stormwater from Small Municipal Separate Storm Sewer Systems (MS4s). This PRP will outline the Township's 5-year plan to reduce sediment loading from the MS4. The Plan will also discuss the calculations and methodology used to determine storm sewershed boundaries, sediment loadings, sediment reductions, and BMP planning.

The Township is located within multiple watersheds – Vernon Run, Crum Creek, Unnamed Tributaries to Crum Creek, Ridley Creek, Unnamed Tributaries to Ridley Creek, Dicks Run, and the Delaware River. Vernon Run, Crum Creek, Ridley Creek, Dicks Run, and the Delaware River are considered impaired according to DEP's *Integrated Water Quality Monitoring and Assessment Report*. All impairments are caused by siltation except for the Unnamed Tributaries to Crum Creek and Ridley Creek and the Delaware River. Therefore, the Township is required to reduce sediment discharging to Vernon Run, Crum Creek, Ridley Creek, and Dicks Run by 10% within the next five years.

SECTION A – PUBLIC PARTICIPATION

There are 3 major components of the public participation process of the PRP – advertising, public comments, and response to public comments. A draft of this PRP was advertised in the Delaware County Daily Times on August 1, 2017. See Appendix 1 for the Proof of Publication. A copy of the draft PRP was made available to the public for the next 30 days. Comments were noted in the meeting minutes of the August 3, 2017 Board of Commissioners Meeting.

The PRP was advertised a second time on September 25, 2020 since the list of proposed BMPs and sediment reduction values changed. A copy of the draft PRP was made available to the public for the next 30 days. The PRP was also discussed at a public Council Meeting on October 22, 2020.

Appendix 2 contains the meeting minutes and notes from the public meetings.

SECTION B – MAP

The entire storm sewer system for the Township was mapped and the storm sewersheds were delineated based on the stormwater flows going to each municipal inlet. See Appendix 3 and Appendix 4 for maps of the Township's storm sewer system and storm sewersheds. Please

note that Appendix 3 shows municipal inlets and storm sewer systems as well as State and private inlets.

Three distinct areas have been parsed out of the municipal sewersheds - State roads, areas that do not drain to the MS4, and the 300 ft Rule. This parsing has been done following DEP's Parsing Guidelines.

In this PRP, Observation Points are used to mark where water from municipal streets is going to end up before crossing into another municipality, parsed NPDES permit area, or State road. It is important to note that these points area used to conduct the MCM testing and are either located at manholes or inlets within the Township.

The various maps for this PRP (Storm Sewer Map, Storm Sewershed Map, Land Use Map, etc.) are listed in the Table of Contents on page 2 of this report.

SECTION C – POLLUTANTS OF CONCERN

This PRP has been developed for impaired waters and the pollutants are based on the impairment listing in DEP's MS4 Requirements Table. An excerpt from that Table is shown below. Since the impairment of the Township's streams are due to siltation, a requirement of 10% sediment reduction must be addressed.

Table 1. Excerpt from DEP's MS4 Requirements Table.

Impaired Downstream Waters or Applicable TMDL Name	**Requirement(s)**
Delaware River*	Appendix C-PCB (4a)
Vernon Run	Appendix E-Siltation (5)
Crum Creek	Appendix C-PCB (4a), Appendix E-Siltation (5)
Unnamed Tributaries to Crum Creek	
Ridley Creek	Appendix E-Siltation (5)
Dicks Run	Appendix E-Siltation (5)
Unnamed Tributaries to Ridley Creek	
*No Township outfall discharges to indicated stream	

There are 7 tributaries that are not identified on DEP's MS4 GIS map; they include the Dicks Run Tributary, Pine Ridge Run (Crum Creek Tributary), Ridley Creek Tributary along Harvey Road, Ridley Creek Tributary along Glen Road and Brent Drive, Ridley Creek Tributary along Providence Road, Vernon Run Tributary along Fox Lane, and Vernon Run Tributary along Brookside Road. The streams were investigated on May 13, May 14, and September 22nd at least 48 hours after the last rain event. Rain data and pictures of the tributaries are attached to this report. In the pictures, flowing water is shown and therefore, these tributaries can be classified as surface waters.

SECTION D – DETERMINE EXISTING LOADING FOR POLLUTANTS OF CONCERN

In this PRP, DEP's Simplified Method was used to calculate the existing sediment loading for each storm sewershed without BMPs. The storm sewersheds were mapped using AutoCAD® and analyzed in ArcMap®. To calculate the existing loading rates, pervious and impervious areas within each storm sewershed needed to be determined. The "DVRPC 2015 Impervious Surface - Delaware County, PA" shapefile from the Delaware Valley Regional Planning Commission was used and overlaid on top of the storm sewershed layer. According to the DVRPC website, "This dataset contains impervious landbase features updated using digital orthoimagery acquired in 2015 by the Delaware Valley Regional Planning Commission (DVRPC) and its partners." Figure 1 shows the "DVRPC 2015 Impervious Surface - Delaware County, PA" shapefile within the Township boundaries.

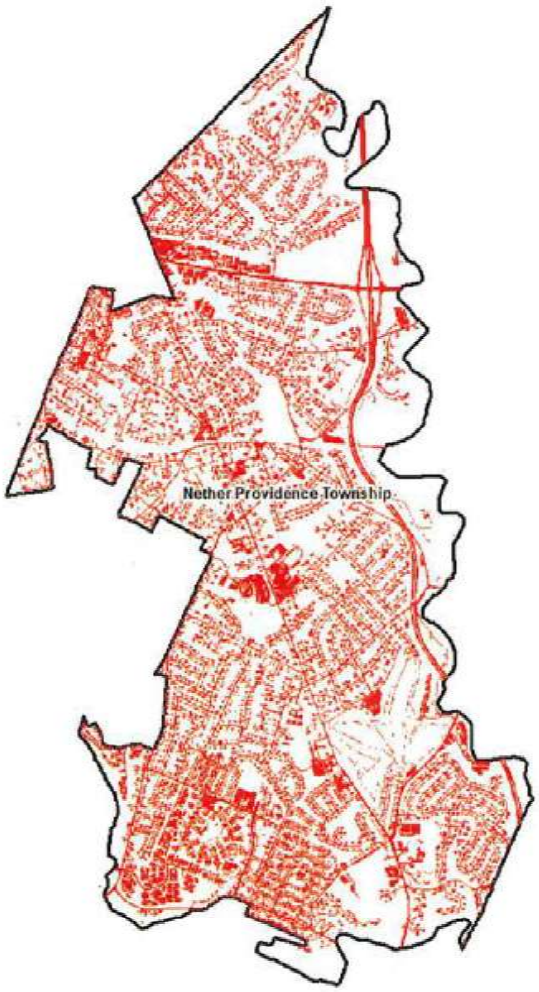


Figure 1. The "DVRPC 2015 Impervious Surface - Delaware County, PA" shapefile shown in red.

To calculate the impervious area within each storm sewershed, the impervious shapefile was clipped to the individual storm sewershed boundaries. For an example of this, please see Figure 2. The impervious area within each storm sewershed was calculated in ArcMap®.

To calculate the pervious area within each storm sewershed, the impervious area and the total storm sewershed area were used. It was assumed that any area outside of the impervious area within a storm sewershed was pervious. See Equation 1 below:

$$Total\ Sewershed\ Area - Impervious\ Area = Pervious\ Area$$

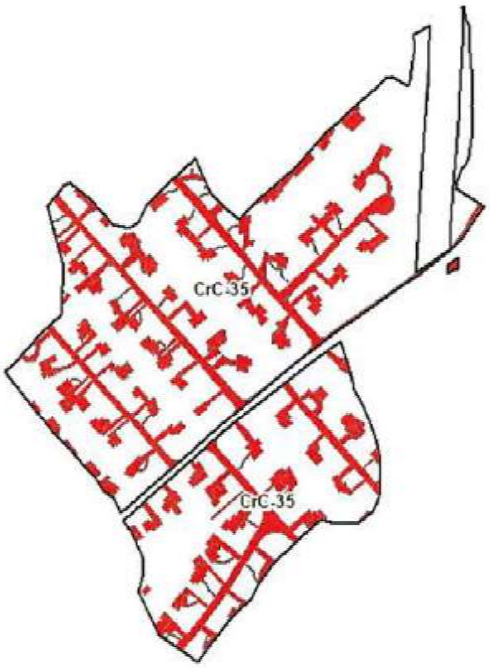


Figure 2. The "DVRPC 2015 Impervious Surface - Delaware County, PA" shapefile (shown in red) has been clipped to the Sewershed CrC-35 boundary.

Appendix 7 shows these area totals for each storm sewershed. To calculate the total sediment loading from each storm sewershed, the TSS (Sediment) loading rate from DEP's PRP Instructions was used. The loading rates are shown in Figure 3 on the following page. Please note that Delaware County is not listed as a separate entity in this table; the loading rates used in this PRP come from the "All Other Counties" column.

3800-PM-BCW0100k 3/2017
PRP Instructions

County	Category	Acres	TN lbs/acre/yr	TP lbs/acre/yr	TSS (Sediment) lbs/acre/yr
McKean	impervious developed	38.7	20.93	3.21	1,843.27
	pervious developed	5.3	22.58	1.45	249.26
Mifflin	impervious developed	5,560.2	21.83	1.79	1,979.13
	pervious developed	16,405.5	21.13	0.71	296.07
Montour	impervious developed	5,560.2	21.83	1.79	1,979.13
	pervious developed	16,405.5	21.13	0.71	296.07
Northumberland	impervious developed	8,687.3	25.73	1.54	2,197.08
	pervious developed	25,168.3	24.63	0.54	367.84
Perry	impervious developed	5,041.1	26.77	1.32	2,314.7
	pervious developed	9,977	23.94	0.51	343.16
Potter	impervious developed	2,936.3	16.95	2.75	1,728.34
	pervious developed	2,699.3	17.11	1.09	265.2
Schuylkill	impervious developed	5,638.7	30.49	1.56	1,921.08
	pervious developed	14,797.2	29.41	0.57	264.04
Snyder	impervious developed	4,934.2	28.6	1.11	2,068.16
	pervious developed	14,718.1	24.35	0.4	301.5
Somerset	impervious developed	1,013.6	25.13	2.79	1,845.7
	pervious developed	851.2	25.71	1.14	293.42
Sullivan	impervious developed	3,031.7	19.08	2.85	2,013.9
	pervious developed	3,943.4	21.55	1.31	301.58
Susquehanna	impervious developed	7,042.1	19.29	2.86	1,405.73
	pervious developed	14,749.7	20.77	1.21	203.85
Tioga	impervious developed	7,966.9	12.37	2.09	1,767.75
	pervious developed	18,090.3	12.22	0.76	261.94
Union	impervious developed	4,382.6	22.98	2.04	2,393.55
	pervious developed	14,065.3	20.88	0.69	343.81
Wayne	impervious developed	320.5	18.69	2.89	1,002.58
	pervious developed	509	21.14	1.31	158.48
Wyoming	impervious developed	3,634.4	16.03	2.53	2,022.32
	pervious developed	10,792.9	13.75	0.7	238.26
York	impervious developed	10,330.7	29.69	1.18	1,614.15
	pervious developed	40,374.8	18.73	0.29	220.4
All Other Counties	impervious developed	-	23.06	2.28	1,839
	pervious developed	-	20.72	0.84	264.96

Figure 3. Section from Attachment B titled "Developed Land Loading Rates for PA Counties" from the DEP's PRP Instructions.

Sediment loading rates for each storm sewershed were calculated using Equation 2 below. The calculated existing sediment loading rates without BMPs are shown in Appendix 7.

$$Impervious\ Area\ (acres)\ x\ TSS\ (lbs/acre/yr) = Sediment\ Loading\ (lbs/yr)$$

$$+\quad Pervious\ Area\ (acres)\ x\ TSS\ (lbs/acre/yr) = Sediment\ Loading\ (lbs/yr)$$

$$= Total\ Sediment\ Loading\ (lbs/yr)$$

According to Section I.C of DEP's PRP Instructions, "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." However, to claim credit for these BMPs, the BMPs must be currently installed and maintained in existing load estimates, i.e. sewersheds.

The Township contains 4 existing structural BMPs that were installed prior to this PRP. These BMPs are within the sewershed boundaries and therefore can be accounted for in the existing sediment loading calculations. There is a rain garden at the Township building and was installed between 2009 and 2010. The coordinates of this BMP are 75° 22' 5.950" W, 39° 54' 0.710" N. There is a rain garden at Sapovits Park and was also installed between 2009 and 2010. The coordinates of this BMP are 75° 22' 53.668" W, 39° 54' 37.652" N. There is a detention basin located to the West of Weston Village and was installed in the early 1980's. The coordinates of this BMP are 75° 22' 57.098" W, 39° 52' 33.769" N. This BMP is in a sewershed that does not have a requirement for siltation (Unnamed Tributary to Ridley Creek). There is another detention basin located to the East of Weston Village and was installed in the late 1980's. The coordinates of this BMP are 75° 22' 42.628" W, 39° 52' 33.491" N. The map of these existing BMPs is Appendix 9 of this Report. The list of the BMPs that are within the sewershed boundaries is Appendix 11.

BMP sediment removal values were calculated using DEP's Simplified Method. The existing BMP calculations can be seen in Appendix 11. The Existing Sediment Loadings for DiR-33A, VR-17, and RC-58A have been adjusted accordingly to take credit for these BMPs. The total existing sediment loading rates can be seen in Appendix 7 and Appendix 12.

The impairment for Vernon Run, Crum Creek, Ridley Creek, and Dicks Run is based on siltation, therefore a minimum of 10% TSS reduction is required. The impairment for the Delaware River is based on PCB so the 10% TSS reduction is not applicable. The Unnamed Tributaries to Crum Creek and Ridley Creek do not have impairments. The final loading totals for each watershed subject to the sediment removal requirement were multiplied by 10% to determine the required reductions. Final sediment loading values and required reductions are shown in Appendix 12.

SECTION E – SELECT BMPS TO ACHIEVE THE MINIMUM REQUIRED REDUCTIONS IN POLLUTANT LOADING

To meet the required sediment reductions within the 5-year period, various BMPs need to be constructed within the Township within this time period. Required reductions outlined in Section D need to be met by the end of the 5-year period. BMP pollutant load removal rates vary depending on the type of BMP. Therefore, careful planning was considered when choosing the correct BMPs to meet the required load reductions.

BMP planning has been separated by watershed. Each watershed needs to meet the 10% reduction requirement. Since the Township has limited municipal owned parks, recreation, and open areas, BMP planning was based on land ownership, land use, sediment reduction, and feasibility. To reach these goals, proposed BMPs have been determined. The BMPs selected include various infiltration basins, rain gardens, seepage beds, tree plantings, and streambank restoration. Calculations are shown in Appendix 13. The locations of the proposed BMPs are shown in Appendix 9.

To calculate the BMP sediment loading rates, DEP's Simplified Method was used. Equation 2 from Section D was used to calculate the sediment loading rate for each BMP. In this case, the area value used is how many acres are draining to and being treated by the proposed BMP.

BMPs are not 100% efficient, therefore, the sediment loading rates need to be multiplied by the BMP Effectiveness value (Appendix 8). Removal rates were calculated using Equation 3 below:

$$Sediment\ Loading\ Rate\ (lbs/yr)\ x\ Effectiveness\ Value = Removal\ Rate\ (lbs/yr)$$

Based on these removal rates for each proposed BMP, the Township will meet the 10% reduction goal.

Stream restoration, one of the BMPs selected, must meet qualifying criteria to be eligible for MS4 load reduction credits. DEP's "Considerations of Stream Restoration Projects in Pennsylvania for eligibility as an MS4 Best Management Practice" document outlines the relevant qualifying criteria. A copy of the document is in Appendix 14. The qualifying criteria and what the Township has done to meet the criteria are described in the Table below.

Table 2. Streambank restoration qualifying criteria and steps done to meet it.

Criteria	What has been done	Location in PRP
Permittee must document existing channel or streambank erosion and an actively enlarging or incising urban stream condition prior to restoration (an existing problem)	Pictures of the streambank were taken where restoration is planned to be competed	Appendix 14
Effectiveness is most readily demonstrated for projects in 1st-3rd order streams (small). Larger scale projects will require additional documentation	Stream order has been determined	Appendix 14
The project must address at least 100 linear feet of stream channel	This has been taken into account in the Planned BMP calculations	Appendix 13
Impervious areas upstream of the project must be sufficiently treated to address peak flows that may exceed engineering design thresholds or compromise channel form and function	This will be considered in the design	

The project must address both sides of the channel on sites where a need to do so is evident	This has been taken into account in the Planned BMP calculations	Appendix 13

SECTION F – FUNDING MECHANISM(S)

The Township is exploring funding opportunities to construct and maintain the planned BMPs. The number and types of BMPs were chosen to meet the required reduction rates, to minimize possible costs, and maximize the area draining to and treated by BMPs. The Township plans on funding the BMPs through the municipality's annual budget and/or applying for local, State, and/or Federal grants, as necessary. At this time, raising taxes or charging homeowners and industries does not sound feasible. Please note that the cost for each BMP has not been determined yet.

SECTION G – IDENTIFY RESPONSIBLE PARTIES FOR OPERATION AND MAINTENANCE (O&M) OF BMPS

Once the planned BMPs are constructed and being used, O&M of these structures need to be implemented. The BMPs will be constructed on Township owned land so the Township will be responsible for the O&M.

Activities and frequency involved with O&M for each BMP is outlined in the table below. Please note that the same O&M for similar BMPs is assumed. In addition to using the Pennsylvania Stormwater Best Management Practices Manual, O&M information should also come from the Nether Providence Township Stormwater Management Ordinance.

Since Stream Bank Restoration is not listed in the BMP Manual, the Stormwater Best Management Practice Operations, Maintenance, and Inspection Agreement in the Ordinance should be followed. In the first couple of years following the construction of the stream bank restoration project, the banks should be inspected at least 2 – 4 times per year or after major storm events[1] to replace any plants and to make sure the bank continues to be stabilized.

[1] In the *Pennsylvania Stormwater Best Management Practices Manual, Section 3 Stormwater Management Principles, Goals, and a Management Model* under Section 3.2.1, the "smaller storms [are] typically the 2-year storm and under." Therefore, a larger/major storm can be anything above the 2-year storm.

Table 3. O&M Excerpts from Chapter 6 of the *Pennsylvania Stormwater Best Management Practices Manual*.

Type of BMP	Maintenance Issues
Infiltration Trench	• Catch Basins and Inlets should be inspected and cleaned at least 2 times per year. • The vegetation along the surface of the Infiltration Trench should be maintained in good condition, and any bare spots revegetated as soon as possible. • Vehicles should not be parked or driven on a vegetated Infiltration Trench, and care should be taken to avoid excessive compaction by mowers.
Detention Basin	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 clogged and excessive debris and sediment accumulation at least four times per year, as well as after every storm greater than 1 inch. o 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. o Vegetated areas should be inspected annually for erosion. o Vegetated areas should be inspected annually for unwanted growth of exotic/invasive species. o Vegetative cover should be maintained at a minimum of 95 percent. If vegetative cover has been reduced by 10%, vegetation should be reestablished.
Bioswale	Maintenance activities to be done annually and within 48 hours after every major storm event (> 1 inch rainfall depth): • Inspect and correct erosion problems, damage to vegetation, and sediment and debris accumulation (address when > 3 inches at any spot or covering vegetation) • Inspect vegetation on side slopes for erosion and formation of rills or gullies, correct as needed

	• Inspect for pools of standing water; dewater and discharge to an approved location and restore to design grade • Mow and trim vegetation to ensure safety, aesthetics, proper swale operation, or to suppress weeds and invasive vegetation; dispose of cuttings in a local composting facility; mow only when swale is dry to avoid rutting • Inspect for litter; remove prior to mowing • Inspect for uniformity in cross-section and longitudinal slope, correct as needed • Inspect swale inlet (curb cuts, pipes, etc.) and outlet for signs of erosion or blockage, correct as needed Maintenance activities to be done as needed: • Plant alternative grass species in the event of unsuccessful establishment. • Reseed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming • Rototill and replant swale if draw down time is more than 48 hours • Inspect and correct check dams when signs of altered water flow (channelization, obstructions, erosion, etc.) are identified • Water during dry periods, fertilize, and apply pesticide only when absolutely necessary
Bioretention /Rain Garden	Properly designed and installed Bioretention areas require some regular maintenance. • While vegetation is being established, pruning and weeding may be required. • Detritus may also need to be removed every year. Perennial plantings may be cut down at the end of the growing season. • Mulch should be re-spread when erosion is evident and be replenished as needed. Once every 2 to 3 years the entire area may require mulch replacement. • Bioretention areas should be inspected at least two times per year for sediment buildup, erosion, vegetative conditions, etc. • During periods of extended drought, Bioretention areas may require watering. • Trees and shrubs should be inspected twice per year to evaluate health.
Subsurface Infiltration Bed	Subsurface Infiltration is generally less maintenance intensive than other practices of its type. Generally speaking, vegetation associated with Subsurface Infiltration practices is less substantial than practices such as

	Recharge Gardens and Vegetated Swales and therefore requires less maintenance. Maintenance activities required for the subsurface bed are similar to those of any infiltration system and focus on regular sediment and debris removal. The following represents the recommended maintenance efforts: • 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.

Appendix 1
Proof of Publication

21ST CENTURY media

digitalfirst MEDIA

PHILADELPHIA GROUP - PUBLISHERS OF:

The Delaware County Daily Times, a newspaper of general circulation, established September 7, 1876

AFFIDAVIT OF PUBLICATION

639 S. Chester Rd. • Swarthmore, PA 19081

NETHER PROVIDENCE TWP.
214 SYKES LANE
WALLINGFORD, PA 19086-6350
Attention:

STATE OF PENNSYLVANIA,
COUNTY OF DELAWARE

The undersigned Eleanor T. Bick, being duly sworn the he/she is the principal clerk of Daily Times and Sunday Times, Daily & Sunday Times Digital, published in the English language for the dissemination of local or transmitted news and intelligence of a general character, which are duly qualified newspapers, and the annexed hereto is a copy of certain order, notice, publication or advertisement of:

NETHER PROVIDENCE TWP.

Published in the following edition(s):

Daily Times and Sunday Times	08/01/17
Daily & Sunday Times Digital	08/01/17

Public Notice

NETHER PROVIDENCE TOWNSHIP, DELAWARE COUNTY POLLUTANT REDUCTION PLAN

Nether Providence Township will accept comments from the public beginning on August 1, 2017 and extending through August 31, 2017 associated with the Township's Pollutant Reduction Plan (PRP) as required by the Pennsylvania Department of Environmental Protection as a component of the Township's National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Stormwater form Small Municipal Separate Storm Sewer Systems (MS4s). The PRP will outline in general terms the Township's 5-year plan between 2018 and 2023 to reduce sediment loadings from the MS4 stormwater discharges. The PRP will be available for public review at the municipal office of Nether Providence Township located at 214 Sykes Lane, Wallingford, PA 19086. Comments should be provided in writing and delivered in person, via e-mail or U.S.P.S. and addressed to Gary Cummings, Township Manager. Comments received after August 31, 2017 will not be considered by the Township Commissioners.
DCT, August 1, a-1

Affiant further deposes that she/he is not interested in the subject matter of the aforesaid notice of advertisement, and that all allegations in the foregoing statements as to time, place and character of publication are true:

Sworn to the subscribed before me this August 1, 2017.

Dianne McCormick

Notary Public, State of Pennsylvania
Acting in County of Delaware

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Dianne McCormick, Notary Public
Ridley Twp., Delaware County
My Commission Expires April 20, 2020
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

Advertisement Information

Client Id: 881530 **Ad Id:** 1397412 **PO:** **Sales Person:** 066305

Public Notice

NETHER PROVIDENCE TOWNSHIP, DELAWARE COUNTY
POLLUTANT REDUCTION PLAN

Nether Providence Township will accept comments from the public beginning on September 25, 2020 and extending through October 25, 2020 associated with the Township's Pollutant Reduction Plan (PRP) as required by the Pennsylvania Department of Environmental Protection as a component of the Township's National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Stormwater from Small Municipal Separate Storm Sewer Systems (MS4s). The PRP will outline in general terms the Township's 5-year plan to reduce sediment loadings from the MS4 stormwater discharges. The PRP will be available for public review on the Nether Providence Township website. Comments should be provided in writing and sent via e-mail or U.S.P.S. and addressed to Dave Grady, Township Manager. Comments received after October 25, 2020 will not be considered by the Township Officials. Additionally, there will be a public meeting on Thursday October 22nd during which time the PRP will be discussed and the public will be given the opportunity to ask questions and/or give comments on the Plan.

TO BE PUBLISHED: Friday, September 25, 2020

PROOF OF PUBLICATION AND INVOICE TO:

Nether Providence Township
214 Sykes Lane
Wallingford, PA 19086

PLEASE CONSOLIDATE SPACE IN AD

Appendix 2
Meeting minutes

(230) **BOARD OF COMMISSIONERS of NETHER PROVIDENCE TOWNSHIP**
MEETING of August 3, 2017

A legislative meeting of the Board of Commissioners of Nether Providence Township, duly advertised and posted in accordance with law, was called to order at 7:30 PM on Thursday, August 3, 2017 in the Board of Commissioners' Meeting Room, Township Municipal Building, 214 Sykes Lane, Wallingford, PA 19086.

ROLL CALL

PRESENT: Commissioner Much
Commissioner Knapp
Commissioner Kenworthy
Commissioner Baker
Commissioner O'Connor

Gary Cummings	Township Manager
Dave Grady	Assistant Township Manager
Mike Maddren	Township Solicitor
Lisa Swan	Finance Director
David Splain	Chief of Police
Charles Catania	Township Engineer

EXCUSED: Commissioner Dougherty
Commissioner Sullivan

PUBLIC

Approximately 12 people in attendance.

ROLL CALL AND PLEDGE OF ALLEGIANCE

Mr. Much led the Pledge of Allegiance which was recited by all.

SCOUT PROJECT

Scout Liam Walker – Presented his trail clearing project to the Board for Furness park.

PUBLIC COMMENTS

Heather Warley of 202 Hempstead Lane stated she is PTO President and requested the WES School Zone be extended. Mr. Much asked if she discussed this with the School District and she said No.

APPOINTMENTS to BOARDS and COMMISSIONS

Mr. Much moved to make Tyler Buzzuto a full member of the Shade Tree Commission. Mr. O'Connor seconded the motion which passed by a vote of 5-0.

APPROVAL OF MINUTES

Legislative Meeting of July 13, 2017

Mr. Much moved for approval of the minutes of the July 13, 2017 legislative meeting. Mr. Kenworthy seconded the motion which passed by a vote of 5-0.

SOLICITORS REPORT

Mr. Maddren noted items were discussed during the executive session.

ENGINEERS REPORT

Mr. Catania spoke on the required MS4 Pollution Reduction Program and noted that the Notice of Intent (NOI) must be submitted by September 16th in order to comply with the program. He presented a draft map and listed proposed methods to receive credit for load reductions. He noted annual township loads are approximately two million pounds and we must reduce loads by 10% or 20,000 pounds over 5 years. He looked at township properties and proposed stream bank restoration and other projects. Mr. Catania asked the Board to review the draft plan and estimated the cost could be up to $1.5 million over the five-year period. He noted the plan is to be on file by August 16th. Mr. Kenworthy asked about the comment period and whether the Board had to comment. Mr. Catania said we just have to put the proposed plan out there and can make adjustments as needed.

PUBLIC SAFETYCOMMITTEE REPORT

Mr. Much gave the monthly Police report and noted solicitors need a permit.

Traffic Calming (Meadow Lane speed humps) – Mr. Catania noted he needs to contact the contractor on when he is to start.

Pedestrian safety (E. Brookhaven/Turner Roads) – Mr. Much noted Chief Splain will be reviewing and Traffic Safety Officer Kevin Smith will be doing speed surveys.

Request left turn signals at Providence Road and Meadow lane/ E. Rose Valley Road intersection – Mr. Much asked to table this until Mr. Sullivan can be present.

Expand school zone at WES – Mr. Much suggested we coordinate with the school district. Mr. Kenworthy noted that Mr. Cummings has asked for a cost estimate to extend the zone. Mr. Much asked Mr. Cummings to ask Mr. Hardy, Nick Cirilli and Lisa Palmer to get their thoughts.

FIRE AND ADMINISTRATION COMMITTEE REPORT

There was nothing to report in Mr. Dougherty's absence.

PUBLIC WORKS COMMITTEE REPORT

Road Resurfacing Schedule – Mr. O'Connor noted he is waiting for dates from the contractor.

Dennis Lane paving contribution to Aqua – Mr. O'Connor stated Aqua requested the Township to reconsider our contribution amount for them paving all of Dennis Lane. Mr. Cummings and Mr. Catania will meet with Aqua officials and discuss.

Recycling contract bids to be received August 1 – Mr. O'Connor noted the base bids for year 1 and year 2 were received as follows:

Year	1	/	2
H & H -	$49.10	/	$50.55
A.J Blosenski -	$51.48	/	$51.48
JP Mascaro -	$51.84	/	$51.84
Creative Waste/B&L -	$57.85	/	$59.60

After discussion, Mr. O'Connor moved to accept the bid of H & H for 2018 and 2019. Mr. Kenworthy seconded the motion which passed by a vote of 5-0. Mr. Much noted H & H's low bid is less than we are currently paying.

Mr. O'Connor gave the highway report and noted Mike MacCall was appointed as the new Assistant Public Works Director and wished him well.

FINANCE AND ADMINISTRATIVE COMMITTEE REPORT

Motion to approve Warrant List –Mr. Kenworthy went through the warrant list and asked about the payment to JD Eckman for work on Copples Lane. It was noted PADOT will reimburse the township. There being no more questions Mr. Kenworthy made a motion to approve the warrant list. Mr. Much seconded the motion which passed by a vote of 5-0.

EIT – Keystone data and proposals – Mr. Kenworthy noted new data was received and it is in the Boards packets. He asked the Board to review so it can be discussed at the September meeting.

DVRFA loan for LED streetlight project – Mr. Maddren noted the law requires the township to pass an ordinance for the debt and that the drafted ordinance was in order. Mr. Kenworthy made a motion to approve Ordinance 796. Mr. Much seconded the motion which passed by a vote of 5-0.

Budget review and 2018 Budget Schedule – Mr. Kenworthy noted the schedule is in the Board's packet and that staff are working on a cash flow analysis to let us know where we are this year.

COMMUNITY ENHANCEMENT COMMITTEE REPORT

Summer Recreation Program – Mr. Baker noted the Summer Recreation Program finished up last Thursday and the highlight was the state inspection, which found no deficiencies in the pre-school program so it will continue next year. He said there are lots of thanks to go around and that the program is close to having revenues cover all the expenses.

Family Fun Day on September 16 – Mr. Baker noted that Family Fun Day is September 16th at Strath Haven Middle School and he will be working on the program and activities to be held.

Mr. Much thanked Mr. Baker and the administrative staff and the workers for a fantastic summer recreation program and all of their hard work. Mr. Much noted that Mr. Baker relinquished his 3rd quarter salary to make the program work.

BUILDING AND ZONING COMMITTEE REPORT

Peck Lot Line Revision (donating land to Furness Park) – Mr. Knapp noted the DCPD recommended to approved the revision and suggested rezoning the conveyed portion to the Open Space District. He noted the Township Planning Commission will be reviewing the plan on Monday.

INFRASTRUCTURE COMMITTEE REPORT

Mr. Much reported the following in Mr. Sullivan's absence:

Copples Lane sidewalk (construction has begun) – Mr. Much noted construction has started.

Moore Road sidewalk project – Mr. Much noted the project is at the drainage and storm water phase.

Multi-modal sidewalk (E. Rose Valley Road from Osborne Lane to Providence Road) – Mr. Much noted this walkway extension project will have an RFP sent out for the engineering design phase.

CMAQ sidewalk (E. Possum Hollow Road from Wallingford Station to Providence Road) – Mr. Much stated the E. Possum Hollow sidewalk project is in the engineering design phase and will be constructed in 2020.

PA Small Water and Sewer Grant bids – Mr. Much noted bids are to be received in September.

Transportation Alternative Set-aside funding opportunity (July 10 to September 22) – Mr. Much noted the Township was to possibly consider a request for the Plush Mill/Wallingford Road Bridge walkway.

MANAGERS REPORT

Mr. Cummings noted the Red Cross Blood drive will be on Tuesday August 8th and that sign-ups can be done on line at RedCrossBlood.org and paperwork can be filled out on line in advance at RedCrossBlood.org/rapidpass. Mr. Cummings stated PECO would be starting to replace gas services in the Sproul Estates area and there is a Household Hazardous Waste collection at Penn State Brandywine on September 17th. Mr. Cummings stated the Anti-Bullying Walk will be on October 1st and the E-waste collection previously scheduled on October 14th in the Acme lot will be on a Saturday in November. Mr. Cummings noted the Delaware County 4 H Fair will be on Thursday 8/10 to 8/12 at 395 Bishop Hollow Road in Newtown Square and the Furness Library now has new hours. Mr. Cummings noted there is a website that focuses on helping students applying for student loans. The website is https://studentloans.net/private-student-loans/. He also noted an Employment and Career Expo will be held at the Springfield Country Club on October 19th from 9:00AM to 1:00 PM and noted the Domestic Abuse Project of Delaware County is holding a fundraiser at Chipotle on August 14th.

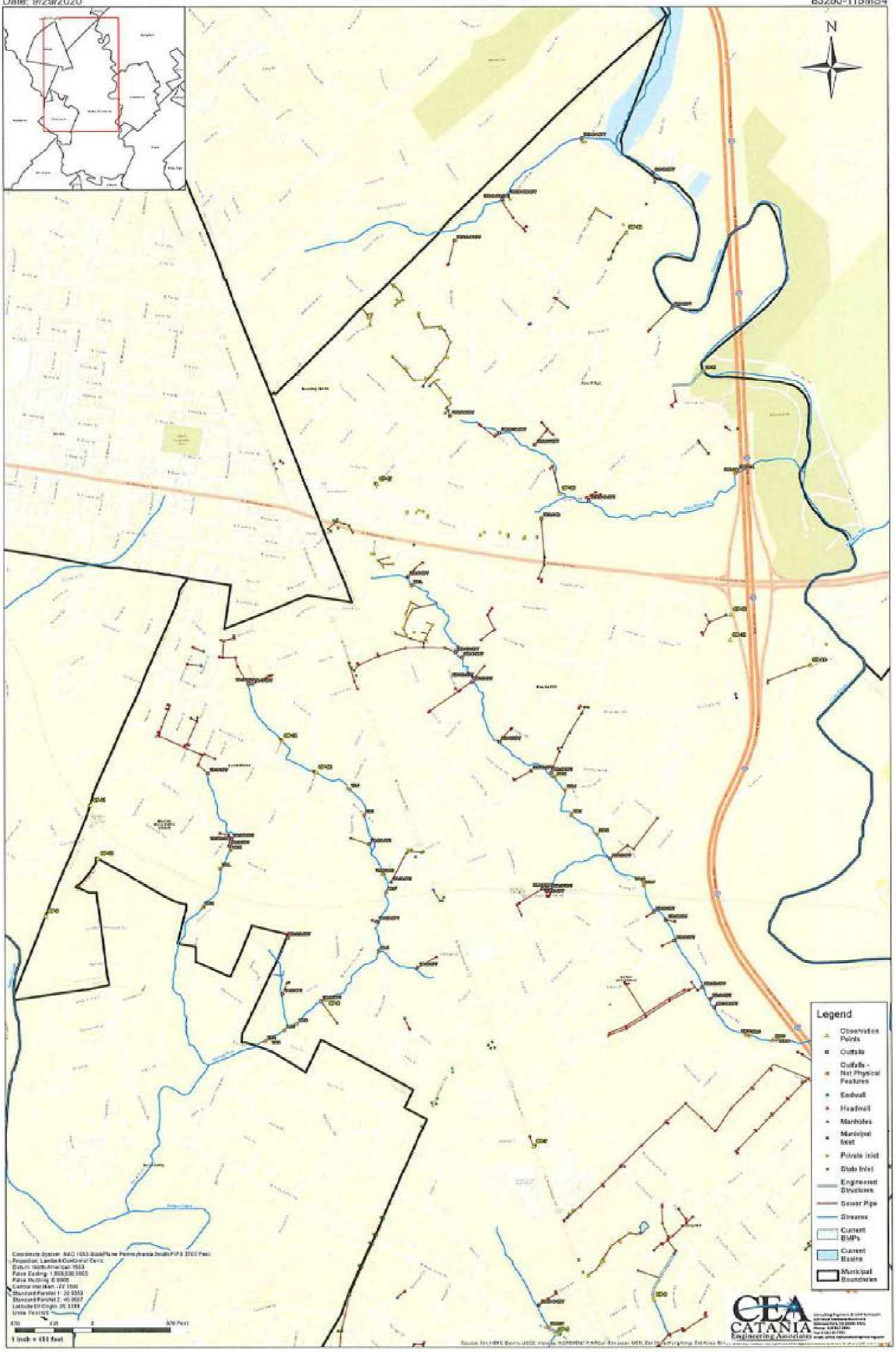
ADJOURMENT – Mr. Much noted the next meeting is September 7th. There being no further business the meeting was adjourned.

Appendix 3
Storm Sewer Map

Nether Providence Storm Sewer Map
(Northern Section)

Date: 9/29/2020

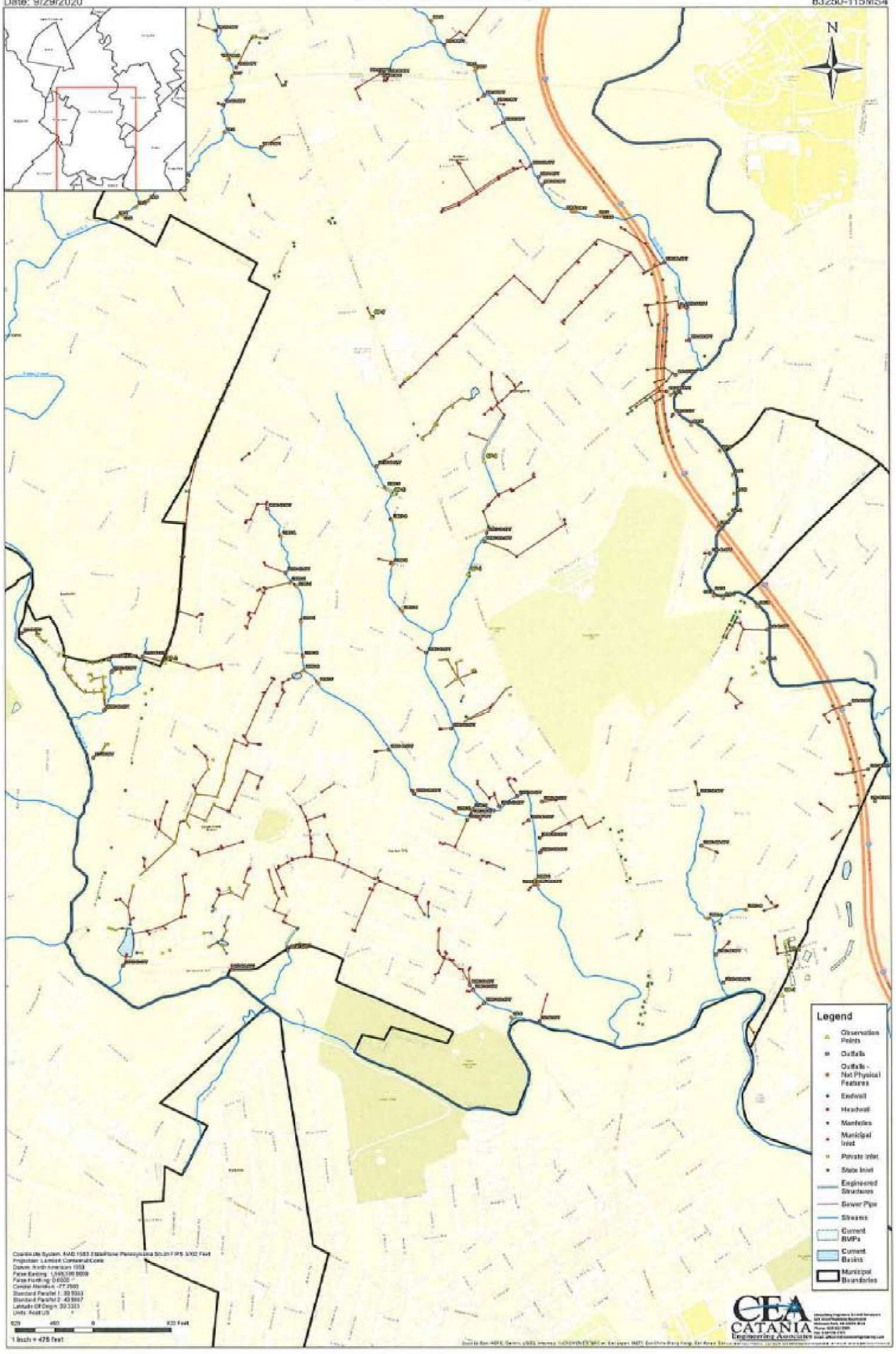
Nether Providence Township
83250-115MS4



Nether Providence Storm Sewer Map
(Southern Section)

Date: 9/29/2020

Nether Providence Township
83250-115MS4



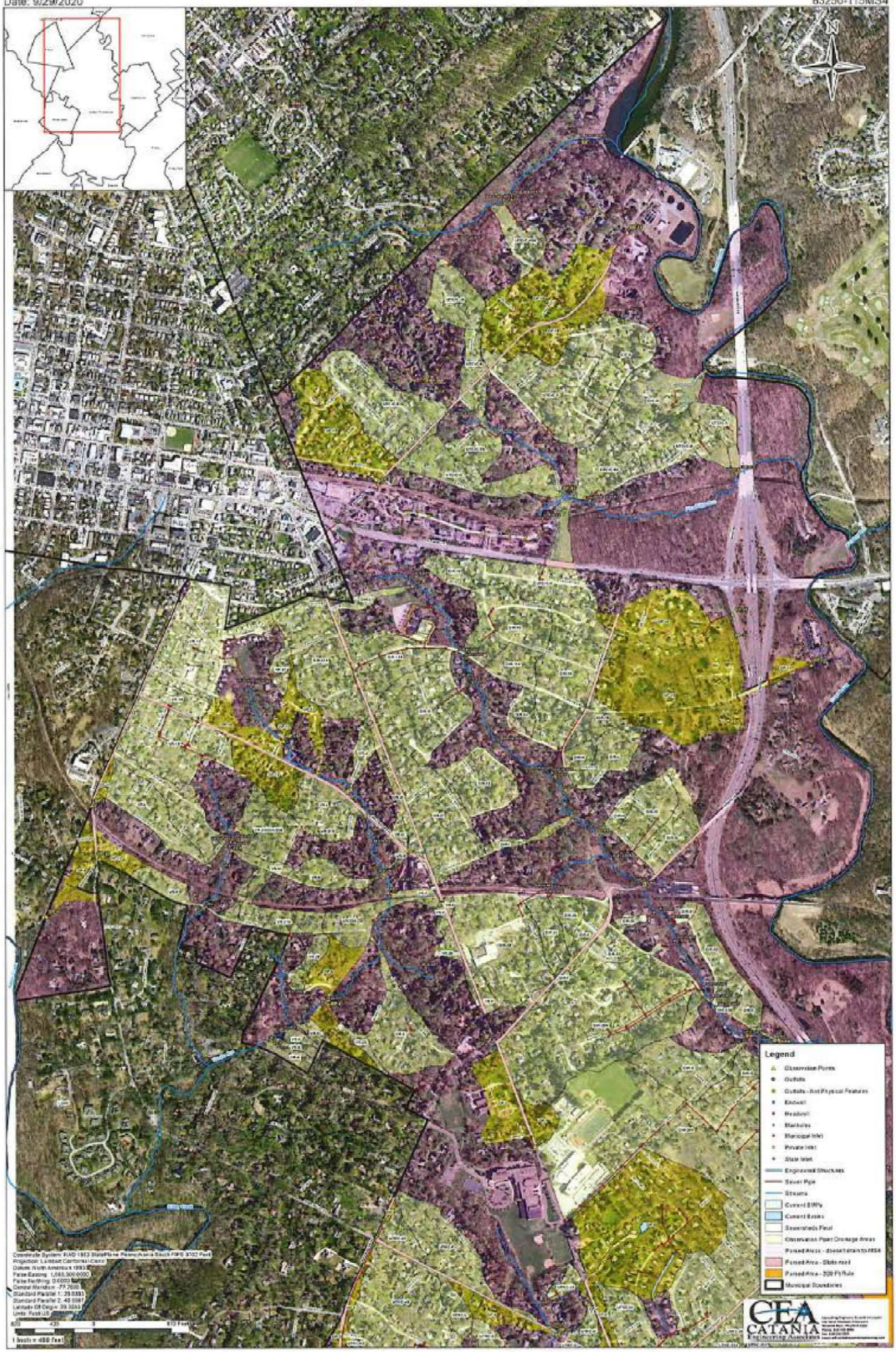
Appendix 4

Storm Sewershed Map

Nether Providence Storm Sewershed Map
(Northern Section)

Date: 9/29/2020

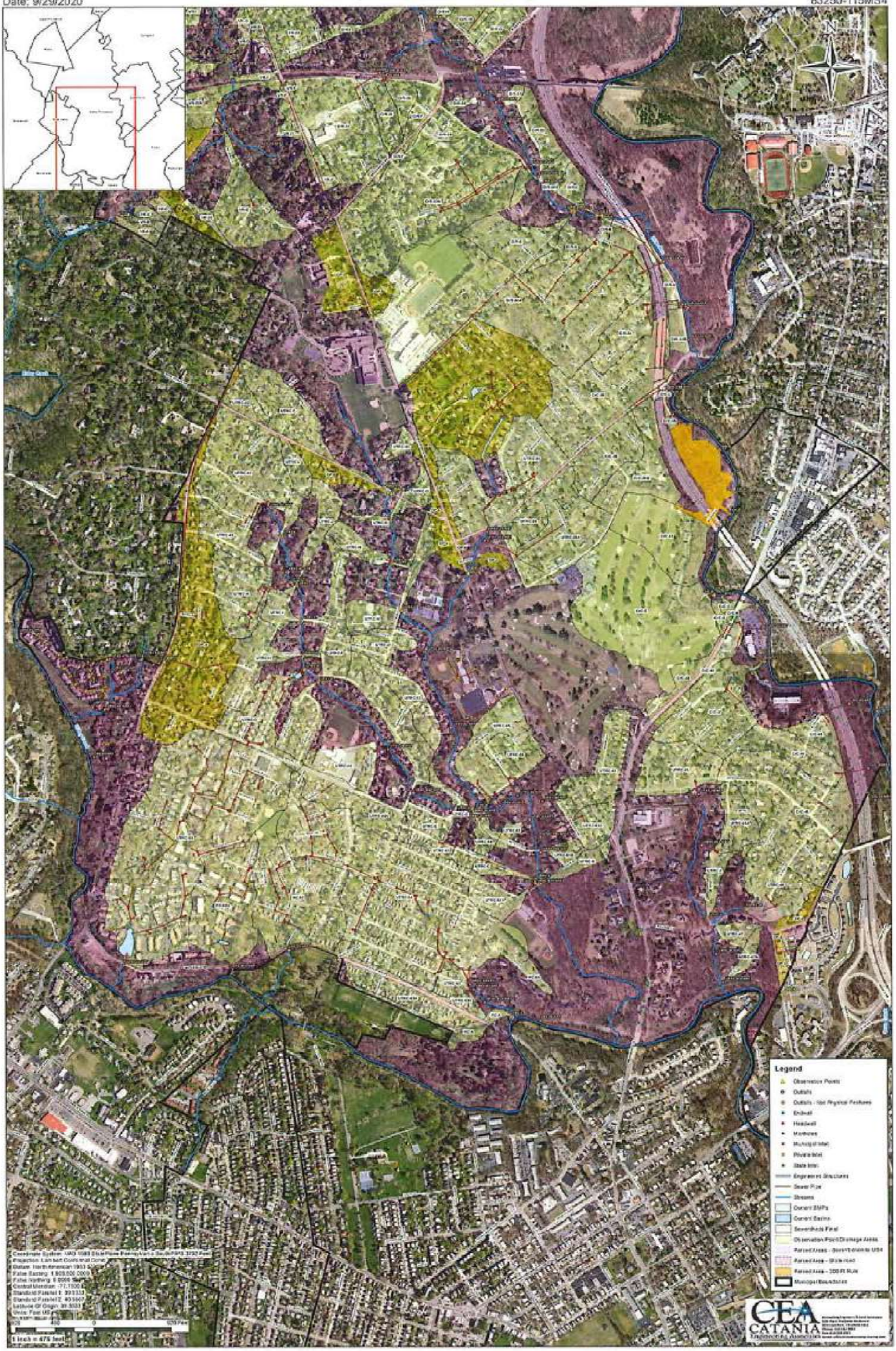
Nether Providence Township
83250-115MS4



Nether Providence Storm Sewershed Map
(Southern Section)

Date: 9/29/2020

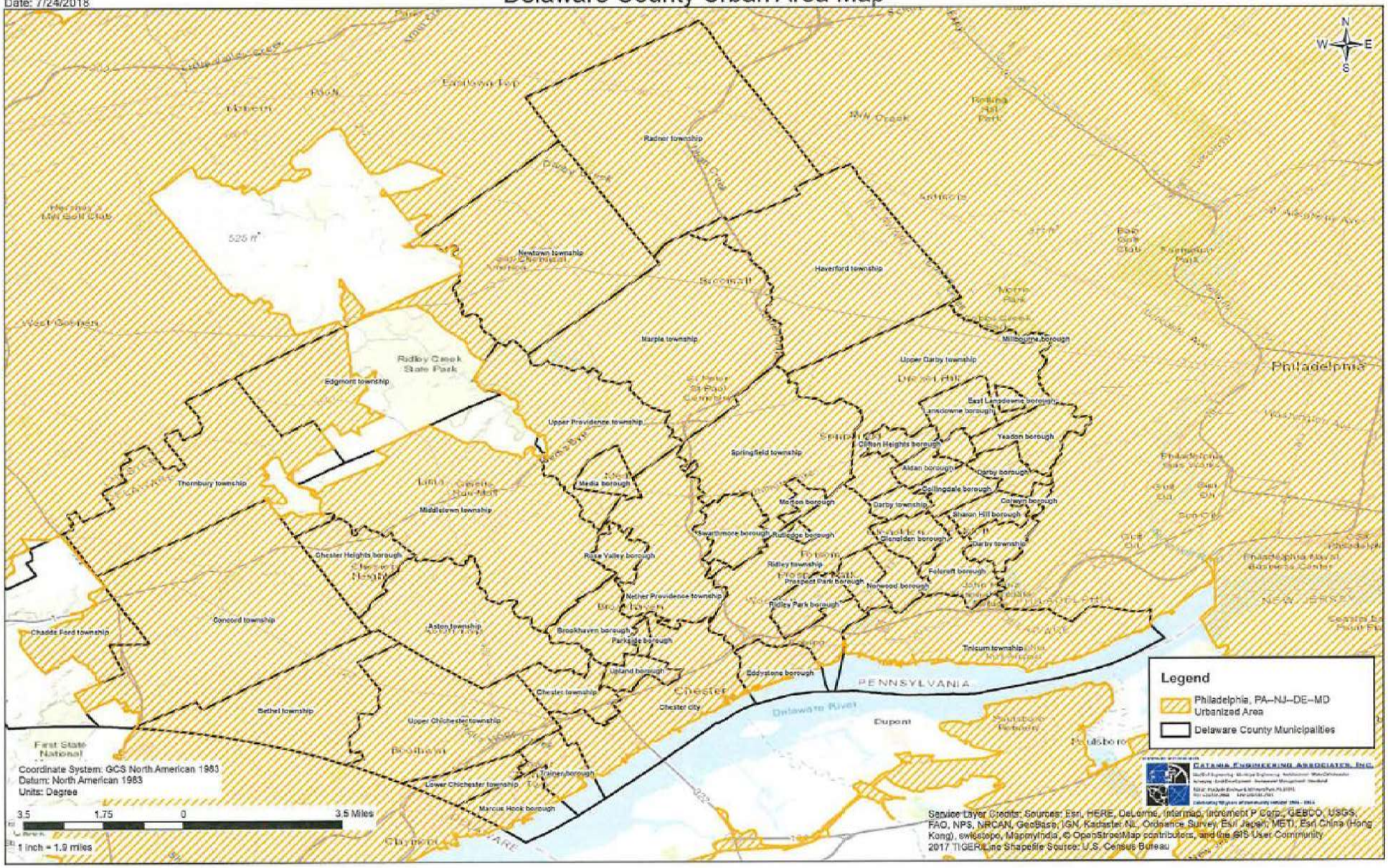
Nether Providence Township
83250-115MS4



Appendix 5
Urbanized Area Map

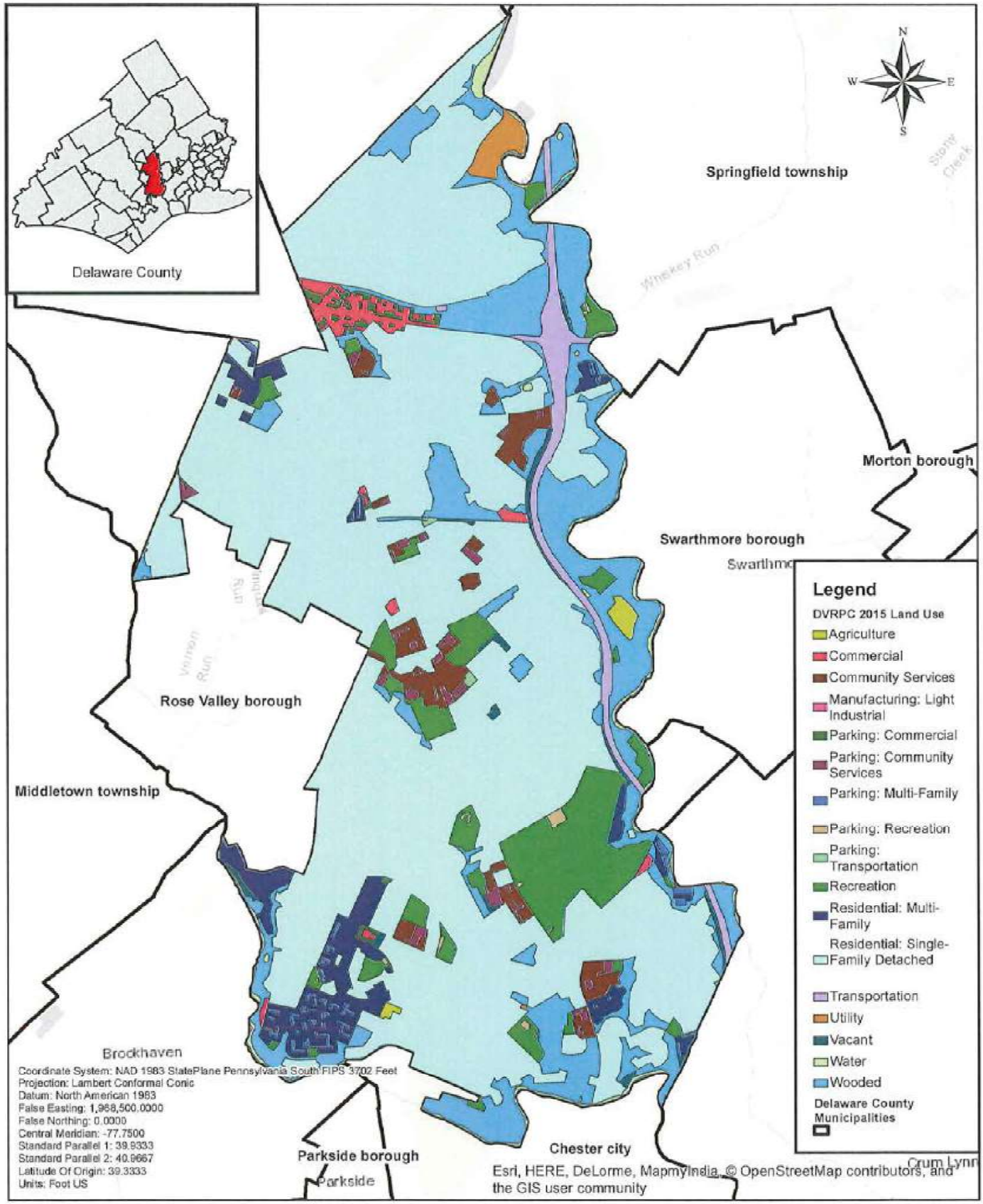
Date: 7/24/2018

Delaware County Urban Area Map



Appendix 6
Land Use Map

Nether Providence Township Land Use Map



Catania Engineering Associates, Inc.

Appendix 7
Sediment Loading Calculation

[A] Sewershed	[B] Category	[C] Area (sq. ft)	[D] Area (acres)	Loading Rates for Delaware County			[H] Existing Sediment Loading w/o BMPs (lbs/yr) [D x G]	[I] Existing BMP Sediment Loading (lbs/yr)	[J] Final Existing Sediment Loading (lbs/yr) [H-I]
				[E] TN lbs/acre/yr	[F] TP lbs/acre/yr	[G] TSS (Sediment) lbs/acre/yr			
CrC-6	impervious developed	142,176.53	3.263924	23.06	2.28	1,839	6,002.36		
	pervious developed	429,459.04	9.859023	20.72	0.84	264.96	2,612.25		
	Total:	571,635.57	13.12295				**8,614.60**	0.00	**8,614.60**
CrC-35	impervious developed	374,551.32	8.598515	23.06	2.28	1,839	15,812.67		
	pervious developed	1,139,688.56	26.16365	20.72	0.84	264.96	6,932.32		
	Total:	1,514,239.89	34.76216				**22,744.99**	0.00	**22,744.99**
CrC-35B	impervious developed	115,890.19	2.660473	23.06	2.28	1,839	4,892.61		
	pervious developed	407,761.24	9.36091	20.72	0.84	264.96	2,480.27		
	Total:	523,651.43	12.02138				**7,372.88**	0.00	**7,372.88**
CrC-36	impervious developed	8,211.29	0.188505	23.06	2.28	1,839	346.66		
	pervious developed	18,398.93	0.422381	20.72	0.84	264.96	111.91		
	Total:	26,610.22	0.610887				**458.58**	0.00	**458.58**
CrC-41	impervious developed	93,682.69	2.150659	23.06	2.28	1,839	3,955.06		
	pervious developed	643,097.29	14.76348	20.72	0.84	264.96	3,911.73		
	Total:	736,779.98	16.91414				**7,866.79**	0.00	**7,866.79**
CrC-42	impervious developed	84,998.59	1.951299	23.06	2.28	1,839	3,588.44		
	pervious developed	214,948.24	4.934533	20.72	0.84	264.96	1,307.45		
	Total:	299,946.83	6.885832				**4,895.89**	0.00	**4,895.89**
CrC-43	impervious developed	42,422.29	0.973882	23.06	2.28	1,839	1,790.97		
	pervious developed	137,228.73	3.150338	20.72	0.84	264.96	834.71		
	Total:	179,651.02	4.12422				**2,625.68**	0.00	**2,625.68**
CrC-44	impervious developed	116,913.18	2.683957	23.06	2.28	1,839	4,935.80		
	pervious developed	271,244.95	6.226927	20.72	0.84	264.96	1,649.89		
	Total:	388,158.12	8.910884				**6,585.68**	0.00	**6,585.68**
CrC-45	impervious developed	422,208.56	9.692575	23.06	2.28	1,839	17,824.65		
	pervious developed	1,015,410.08	23.31061	20.72	0.84	264.96	6,176.38		
	Total:	1,437,618.64	33.00318				**24,001.02**	0.00	**24,001.02**
Not Physical Structure CrC-A	impervious developed	229,193.18	5.261551	23.06	2.28	1,839	9,675.99		
	pervious developed	533,381.40	12.24475	20.72	0.84	264.96	3,244.37		
	Total:	762,574.58	17.5063				**12,920.36**	0.00	**12,920.36**
Not Physical Structure CrC-B	impervious developed	20,843.62	0.478504	23.06	2.28	1,839	879.97		
	pervious developed	30,312.34	0.695876	20.72	0.84	264.96	184.38		
	Total:	51,155.96	1.174379				**1,064.35**	0.00	**1,064.35**

[A] Sewershed	[B] Category	[C] Area (sq. ft)	[D] Area (acres)	Loading Rates for Delaware County			[H] Existing Sediment Loading w/o BMPs (lbs/yr)	[I] Existing BMP Sediment Loading (lbs/yr)	[J] Final Existing Sediment Loading (lbs/yr)
				[E] TN lbs/acre/yr	[F] TP lbs/acre/yr	[G] TSS (Sediment) lbs/acre/yr	[D x G]		[H-I]
Not Physical Structure CrC-C	impervious developed	2,311.98	0.053076	23.06	2.28	1,839	97.61		
	pervious developed	11,531.56	0.264728	20.72	0.84	264.96	70.14		
	Total:	13,843.54	0.317804				**167.75**	0.00	**167.75**
Not Physical Structure CrC-D	impervious developed	6,716.62	0.154192	23.06	2.28	1,839	283.56		
	pervious developed	35,461.36	0.814081	20.72	0.84	264.96	215.70		
	Total:	42,177.98	0.968273				**499.26**	0.00	**499.26**
Not Physical Structure CrC-E	impervious developed	217,590.63	4.995194	23.06	2.28	1,839	9,186.16		
	pervious developed	1,685,035.51	38.68309	20.72	0.84	264.96	10,249.47		
	Total:	1,902,626.15	43.67829				**19,435.63**	0.00	**19,435.63**
Not Physical Structure CrC-L	impervious developed	2,906.74	0.06673	23.06	2.28	1,839	122.72		
	pervious developed	1,984.89	0.045567	20.72	0.84	264.96	12.07		
	Total:	4,891.63	0.112296				**134.79**	0.00	**134.79**
Not Physical Structure CrC-M	impervious developed	114,442.62	2.627241	23.06	2.28	1,839	4,831.50		
	pervious developed	489,139.05	11.22909	20.72	0.84	264.96	2,975.26		
	Total:	603,581.67	13.85633				**7,806.76**	0.00	**7,806.76**
Observation Point OP-14	impervious developed	19,346.22	0.444128	23.06	2.28	1,839	816.75		
	pervious developed	60,661.73	1.392602	20.72	0.84	264.96	368.98		
	Total:	80,007.94	1.83673				**1,185.74**	0.00	**1,185.74**
Observation Point OP-15	impervious developed	319,962.15	7.34532	23.06	2.28	1,839	13,508.04		
	pervious developed	1,223,376.45	28.08486	20.72	0.84	264.96	7,441.36		
	Total:	1,543,338.60	35.43018				**20,949.41**	0.00	**20,949.41**
Observation Point OP-16	impervious developed	175,647.72	4.032317	23.06	2.28	1,839	7,415.43		
	pervious developed	411,490.49	9.446522	20.72	0.84	264.96	2,502.95		
	Total:	587,138.21	13.47884				**9,918.38**	0.00	**9,918.38**
Observation Point OP-18	impervious developed	242,998.53	5.578479	23.06	2.28	1,839	10,258.82		
	pervious developed	897,587.15	20.60577	20.72	0.84	264.96	5,459.70		
	Total:	1,140,585.68	26.18424				**15,718.53**	0.00	**15,718.53**
								Crum Creek Total:	**174,967.07**
DiR-10	impervious developed	53,188.54	1.221041	23.06	2.28	1839	2,245.49		
	pervious developed	102,973.42	2.363944	20.72	0.84	264.96	626.35		
	Total:	156,161.96	3.584985				**2,871.85**	0.00	2,871.85
DiR-11	impervious developed	227,353.41	5.219316	23.06	2.28	1839	9,598.32		
	pervious developed	540,046.54	12.39776	20.72	0.84	264.96	3,284.91		
	Total:	767,399.94	17.61708				**12,883.23**	0.00	12,883.23

[A] Sewershed	[B] Category	[C] Area (sq. ft)	[D] Area (acres)	Loading Rates for Delaware County			[H] Existing Sediment Loading w/o BMPs (lbs/yr) [D x G]	[I] Existing BMP Sediment Loading (lbs/yr)	[J] Final Existing Sediment Loading (lbs/yr) [H-I]
				[E] TN lbs/acre/yr	[F] TP lbs/acre/yr	[G] TSS (Sediment) lbs/acre/yr			
DiR-11A	impervious developed	37,428.68	0.859244	23.06	2.28	1839	1,580.15		
	pervious developed	147,903.39	3.395395	20.72	0.84	264.96	899.64		
	Total:	185,332.06	4.254639				**2,479.79**	0.00	**2,479.79**
DiR-12	impervious developed	146,057.60	3.353021	23.06	2.28	1839	6,166.21		
	pervious developed	271,900.37	6.241974	20.72	0.84	264.96	1,653.87		
	Total:	417,957.98	9.594995				**7,820.08**	0.00	**7,820.08**
DiR-13	impervious developed	183,202.00	4.205739	23.06	2.28	1839	7,734.35		
	pervious developed	455,749.77	10.46258	20.72	0.84	264.96	2,772.16		
	Total:	638,951.78	14.66831				**10,506.52**	0.00	**10,506.52**
DiR-13A	impervious developed	405,708.90	9.313795	23.06	2.28	1839	17,128.07		
	pervious developed	995,941.01	22.86366	20.72	0.84	264.96	6,057.96		
	Total:	1,401,649.91	32.17745				**23,186.02**	0.00	**23,186.02**
DiR-14	impervious developed	43,691.87	1.003027	23.06	2.28	1839	1,844.57		
	pervious developed	86,875.79	1.994394	20.72	0.84	264.96	528.43		
	Total:	130,567.66	2.997421				**2,373.00**	0.00	**2,373.00**
DiR-15	impervious developed	295,550.81	6.784913	23.06	2.28	1839	12,477.45		
	pervious developed	794,773.62	18.24549	20.72	0.84	264.96	4,834.33		
	Total:	1,090,324.42	25.0304				**17,311.78**	0.00	**17,311.78**
DiR-16	impervious developed	82,712.02	1.898807	23.06	2.28	1839	3,491.91		
	pervious developed	249,755.67	5.733601	20.72	0.84	264.96	1,519.17		
	Total:	332,467.68	7.632408				**5,011.08**	0.00	**5,011.08**
DiR-23	impervious developed	335,994.53	7.713373	23.06	2.28	1839	14,184.89		
	pervious developed	615,079.24	14.12028	20.72	0.84	264.96	3,741.31		
	Total:	951,073.77	21.83365				**17,926.20**	0.00	**17,926.20**
DiR-24	impervious developed	62,961.67	1.445401	23.06	2.28	1839	2,658.09		
	pervious developed	157,122.68	3.60704	20.72	0.84	264.96	955.72		
	Total:	220,084.35	5.052441				**3,613.81**	0.00	**3,613.81**
DiR-25	impervious developed	48,067.32	1.103474	23.06	2.28	1839	2,029.29		
	pervious developed	91,407.08	2.098418	20.72	0.84	264.96	556.00		
	Total:	139,474.40	3.201892				**2,585.29**	0.00	**2,585.29**
DiR-30	impervious developed	19,099.61	0.438467	23.06	2.28	1839	806.34		
	pervious developed	23,298.74	0.534865	20.72	0.84	264.96	141.72		
	Total:	42,398.35	0.973332				**948.06**	0.00	**948.06**

[A] Sewershed	[B] Category	[C] Area (sq. ft)	[D] Area (acres)	Loading Rates for Delaware County			[H] Existing Sediment Loading w/o BMPs (lbs/yr) [D x G]	[I] Existing BMP Sediment Loading (lbs/yr)	[J] Final Existing Sediment Loading (lbs/yr) [H-I]
				[E] TN lbs/acre/yr	[F] TP lbs/acre/yr	[G] TSS (Sediment) lbs/acre/yr			
DiR-31	impervious developed	14,993.89	0.344212	23.06	2.28	1839	633.01		
	pervious developed	21,882.49	0.502353	20.72	0.84	264.96	133.10		
	Total:	36,876.38	0.846565				**766.11**	0.00	**766.11**
DiR-32	impervious developed	99,632.57	2.287249	23.06	2.28	1839	4,206.25		
	pervious developed	136,519.45	3.134055	20.72	0.84	264.96	830.40		
	Total:	236,152.02	5.421304				**5,036.65**	0.00	**5,036.65**
DiR-33	impervious developed	59,888.06	1.374841	23.06	2.28	1839	2,528.33		
	pervious developed	157,797.54	3.622533	20.72	0.84	264.96	959.83		
	Total:	217,685.59	4.997374				**3,488.16**	0.00	**3,488.16**
DiR-33A	impervious developed	443,404.11	10.17916	23.06	2.28	1839	18,719.47		
	pervious developed	1,591,941.44	36.54595	20.72	0.84	264.96	9,683.21		
	Total:	2,035,345.55	46.7251				**28,402.69**	89.88	**28,312.80**
DiR-33B	impervious developed	41,638.91	0.955898	23.06	2.28	1839	1,757.90		
	pervious developed	112,738.41	2.588118	20.72	0.84	264.96	685.75		
	Total:	154,377.31	3.544015				**2,443.64**	0.00	**2,443.64**
DiR-34	impervious developed	82,945.32	1.904163	23.06	2.28	1839	3,501.75		
	pervious developed	254,633.21	5.845574	20.72	0.84	264.96	1,548.84		
	Total:	337,578.53	7.749737				**5,050.60**	0.00	**5,050.60**
DiR-34A	impervious developed	987,371.05	22.66692	23.06	2.28	1839	41,684.47		
	pervious developed	2,449,569.61	56.23438	20.72	0.84	264.96	14,899.86		
	Total:	3,436,940.66	78.9013				**56,584.33**	0.00	**56,584.33**
DiR-34B	impervious developed	19,897.62	0.456787	23.06	2.28	1839	840.03		
	pervious developed	81,930.73	1.880871	20.72	0.84	264.96	498.36		
	Total:	101,828.35	2.337657				**1,338.39**	0.00	**1,338.39**
Not Physical Structure DiR-A	impervious developed	31,225.63	0.716842	23.06	2.28	1839	1,318.27		
	pervious developed	38,772.92	0.890104	20.72	0.84	264.96	235.84		
	Total:	69,998.56	1.606946				**1,554.11**	0.00	**1,554.11**
Not Physical Structure DiR-B	impervious developed	7,709.53	0.176987	23.06	2.28	1839	325.48		
	pervious developed	22,203.57	0.509724	20.72	0.84	264.96	135.06		
	Total:	29,913.10	0.68671				**460.53**	0.00	**460.53**
Not Physical Structure DiR-C	impervious developed	39,248.92	0.901031	23.06	2.28	1839	1,657.00		
	pervious developed	86,347.74	1.982271	20.72	0.84	264.96	525.22		
	Total:	125,596.66	2.883303				**2,182.22**	0.00	**2,182.22**

[A] Sewershed	[B] Category	[C] Area (sq. ft)	[D] Area (acres)	Loading Rates for Delaware County			[H] Existing Sediment Loading w/o BMPs (lbs/yr) [D x G]	[I] Existing BMP Sediment Loading (lbs/yr)	[J] Final Existing Sediment Loading (lbs/yr) [H-I]
				[E] TN lbs/acre/yr	[F] TP lbs/acre/yr	[G] TSS (Sediment) lbs/acre/yr			
Not Physical Structure DiR-D	impervious developed	41,856.84	0.960901	23.06	2.28	1839	1,767.10		
	pervious developed	122,007.31	2.800902	20.72	0.84	264.96	742.13		
	Total:	163,864.15	3.761803				**2,509.22**	0.00	**2,509.22**
Not Physical Structure DiR-E	impervious developed	123,927.47	2.844983	23.06	2.28	1839	5,231.92		
	pervious developed	353,694.81	8.119715	20.72	0.84	264.96	2,151.40		
	Total:	477,622.28	10.9647				**7,383.32**	0.00	**7,383.32**
Not Physical Structure DiR-F	impervious developed	64,065.13	1.470733	23.06	2.28	1839	2,704.68		
	pervious developed	170,087.56	3.904673	20.72	0.84	264.96	1,034.58		
	Total:	234,152.69	5.375406				**3,739.26**	0.00	**3,739.26**
Not Physical Structure DiR-G	impervious developed	83,712.60	1.921777	23.06	2.28	1839	3,534.15		
	pervious developed	219,671.06	5.042954	20.72	0.84	264.96	1,336.18		
	Total:	303,383.66	6.96473				**4,870.33**	0.00	**4,870.33**
Not Physical Structure DiR-H	impervious developed	27,562.87	0.632756	23.06	2.28	1839	1,163.64		
	pervious developed	42,124.31	0.967041	20.72	0.84	264.96	256.23		
	Total:	69,687.18	1.599797				**1,419.87**	0.00	**1,419.87**
Not Physical Structure DiR-I	impervious developed	18,983.81	0.435808	23.06	2.28	1839	801.45		
	pervious developed	73,366.93	1.684273	20.72	0.84	264.96	446.26		
	Total:	92,350.74	2.120081				**1,247.72**	0.00	**1,247.72**
Not Physical Structure DiR-J	impervious developed	81,198.72	1.864066	23.06	2.28	1839	3,428.02		
	pervious developed	210,472.31	4.831779	20.72	0.84	264.96	1,280.23		
	Total:	291,671.03	6.695846				**4,708.25**	0.00	**4,708.25**
Not Physical Structure DiR-K	impervious developed	26,000.75	0.596895	23.06	2.28	1839	1,097.69		
	pervious developed	67,219.11	1.543138	20.72	0.84	264.96	408.87		
	Total:	93,219.86	2.140033				**1,506.56**	0.00	**1,506.56**
Not Physical Structure DiR-L	impervious developed	25,887.88	0.594304	23.06	2.28	1839	1,092.92		
	pervious developed	53,181.38	1.220877	20.72	0.84	264.96	323.48		
	Total:	79,069.26	1.815181				**1,416.41**	0.00	**1,416.41**
Observation Point OP-17	impervious developed	260,983.46	5.991356	23.06	2.28	1,839	11,018.10		
	pervious developed	515,989.67	11.84549	20.72	0.84	264.96	3,138.58		
	Total:	776,973.13	17.83685				**14,156.69**	0.00	**14,156.69**
								Dicks Run Total:	**259,691.88**
RC-56	impervious developed	24,547.97	0.563544	23.06	2.28	1839	1,036.36		
	pervious developed	38,245.09	0.877986	20.72	0.84	264.96	232.63		
	Total:	62,793.07	1.44153				**1,268.99**	0.00	**1,268.99**

[A] Sewershed	[B] Category	[C] Area (sq. ft)	[D] Area (acres)	Loading Rates for Delaware County			[H] Existing Sediment Loading w/o BMPs (lbs/yr) [D x G]	[I] Existing BMP Sediment Loading (lbs/yr)	[J] Final Existing Sediment Loading (lbs/yr) [H-I]
				[E] TN lbs/acre/yr	[F] TP lbs/acre/yr	[G] TSS (Sediment) lbs/acre/yr			
RC-57	impervious developed	401,273.05	9.211962	23.06	2.28	1839	16,940.80		
	pervious developed	785,048.40	18.02223	20.72	0.84	264.96	4,775.17		
	Total:	1,186,321.45	27.23419				**21,715.97**	0.00	**21,715.97**
RC-58A	impervious developed	357,097.46	8.19783	23.06	2.28	1839	15,075.81		
	pervious developed	531,350.20	12.19812	20.72	0.84	264.96	3,232.01		
	Total:	888,447.66	20.39595				**18,307.82**	10.286.25	**8,021.57**
RC-A	impervious developed	57,300.51	1.315439	23.06	2.28	1839	2,419.09		
	pervious developed	109,873.65	2.522352	20.72	0.84	264.96	668.32		
	Total:	167,174.16	3.837791				**3,087.41**	0.00	**3,087.41**
Observation Point OP-1	impervious developed	29,332.21	0.673375	23.06	2.28	1839	1,238.34		
	pervious developed	19,248.78	0.441891	20.72	0.84	264.96	117.08		
	Total:	48,580.99	1.115266				**1,355.42**	0.00	**1,355.42**
Observation Point OP-2	impervious developed	25,538.47	0.586283	23.06	2.28	1839	1,078.17		
	pervious developed	71,760.13	1.647386	20.72	0.84	264.96	436.49		
	Total:	97,298.60	2.233668				**1,514.66**	0.00	**1,514.66**
Observation Point OP-3	impervious developed	529,004.90	12.14428	23.06	2.28	1839	22,333.33		
	pervious developed	1,130,796.01	25.9595	20.72	0.84	264.96	6,878.23		
	Total:	1,659,800.91	38.10379				**29,211.56**	0.00	**29,211.56**
Observation Point OP-9	impervious developed	52,839.99	1.213039	23.06	2.28	1839	2,230.78		
	pervious developed	159,699.69	3.6662	20.72	0.84	264.96	971.40		
	Total:	212,539.68	4.87924				**3,202.18**	0.00	**3,202.18**
Observation Point OP-10	impervious developed	55,565.08	1.275599	23.06	2.28	1839	2,345.83		
	pervious developed	59,698.68	1.370493	20.72	0.84	264.96	363.13		
	Total:	115,263.77	2.646092				**2,708.95**	0.00	**2,708.95**
Observation Point OP-11	impervious developed	6,745.53	0.154856	23.06	2.28	1839	284.78		
	pervious developed	33,364.07	0.765934	20.72	0.84	264.96	202.94		
	Total:	40,109.60	0.92079				**487.72**	0.00	**487.72**
								Ridley Creek Total:	**72,574.44**
VR-17	impervious developed	34,421.13	0.7902	23.06	2.28	1839	1,453.18		
	pervious developed	56,459.11	1.296123	20.72	0.84	264.96	343.42		
	Total:	90,880.24	2.086323				**1,796.60**	1.437.28	**359.32**
VR-18	impervious developed	416,520.32	9.561991	23.06	2.28	1839	17,584.50		
	pervious developed	490,478.33	11.25983	20.72	0.84	264.96	2,983.41		
	Total:	906,998.64	20.82182				**20,567.91**	0.00	**20,567.91**

[A] Sewershed	[B] Category	[C] Area (sq. ft)	[D] Area (acres)	Loading Rates for Delaware County			[H] Existing Sediment Loading w/o BMPs (lbs/yr) [D x G]	[I] Existing BMP Sediment Loading (lbs/yr)	[J] Final Existing Sediment Loading (lbs/yr) [H-I]
				[E] TN lbs/acre/yr	[F] TP lbs/acre/yr	[G] TSS (Sediment) lbs/acre/yr			
VR-19	impervious developed	335,015.48	7.690897	23.06	2.28	1839	14,143.56		
	pervious developed	574,506.21	13.18885	20.72	0.84	264.96	3,494.52		
	Total:	909,521.69	20.87974				**17,638.08**	0.00	**17,638.08**
VR-20/20A/20B	impervious developed	169,725.71	3.896366	23.06	2.28	1839	7,165.42		
	pervious developed	588,530.86	13.51081	20.72	0.84	264.96	3,579.82		
	Total:	758,256.57	17.40718				**10,745.24**	0.00	**10,745.24**
VR-21	impervious developed	297,938.66	6.839731	23.06	2.28	1839	12,578.26		
	pervious developed	635,296.83	14.58441	20.72	0.84	264.96	3,864.28		
	Total:	933,235.49	21.42414				**16,442.55**	0.00	**16,442.55**
VR-21A	impervious developed	17,968.98	0.412511	23.06	2.28	1839	758.61		
	pervious developed	84,878.25	1.948537	20.72	0.84	264.96	516.28		
	Total:	102,847.23	2.361048				**1,274.89**	0.00	**1,274.89**
VR-22A	impervious developed	80,640.44	1.85125	23.06	2.28	1839	3,404.45		
	pervious developed	198,582.45	4.558826	20.72	0.84	264.96	1,207.91		
	Total:	279,222.89	6.410075				**4,612.35**	0.00	**4,612.35**
VR-26	impervious developed	37,856.02	0.869055	23.06	2.28	1839	1,598.19		
	pervious developed	68,439.77	1.571161	20.72	0.84	264.96	416.29		
	Total:	106,295.79	2.440216				**2,014.49**	0.00	**2,014.49**
VR-27	impervious developed	31,541.10	0.724084	23.06	2.28	1839	1,331.59		
	pervious developed	82,372.84	1.89102	20.72	0.84	264.96	501.04		
	Total:	113,913.94	2.615104				**1,832.64**	0.00	**1,832.64**
VR-27A	impervious developed	65,003.21	1.492268	23.06	2.28	1839	2,744.28		
	pervious developed	226,395.89	5.197335	20.72	0.84	264.96	1,377.09		
	Total:	291,399.10	6.689603				**4,121.37**	0.00	**4,121.37**
VR-28	impervious developed	24,233.54	0.556326	23.06	2.28	1839	1,023.08		
	pervious developed	40,528.56	0.930408	20.72	0.84	264.96	246.52		
	Total:	64,762.10	1.486733				**1,269.60**	0.00	**1,269.60**
Not Physical Structure VR-A	impervious developed	12,724.67	0.292118	23.06	2.28	1839	537.21		
	pervious developed	59,132.63	1.357498	20.72	0.84	264.96	359.68		
	Total:	71,857.30	1.649617				**896.89**	0.00	**896.89**
Not Physical Structure VR-B	impervious developed	17,362.22	0.398582	23.06	2.28	1839	732.99		
	pervious developed	28,319.29	0.650121	20.72	0.84	264.96	172.26		
	Total:	45,681.51	1.048703				**905.25**	0.00	**905.25**

[A] Sewershed	[B] Category	[C] Area (sq. ft)	[D] Area (acres)	Loading Rates for Delaware County			[H] Existing Sediment Loading w/o BMPs (lbs/yr) [D x G]	[I] Existing BMP Sediment Loading (lbs/yr)	[J] Final Existing Sediment Loading (lbs/yr) [H-I]
				[E] TN lbs/acre/yr	[F] TP lbs/acre/yr	[G] TSS (Sediment) lbs/acre/yr			
Not Physical Structure VR-C	impervious developed	12,447.31	0.285751	23.06	2.28	1839	525.50		
	pervious developed	29,206.56	0.67049	20.72	0.84	264.96	177.65		
	Total:	41,653.87	0.956241				**703.15**	0.00	**703.15**
Not Physical Structure VR-D	impervious developed	18,853.87	0.432825	23.06	2.28	1839	795.97		
	pervious developed	30,893.01	0.709206	20.72	0.84	264.96	187.91		
	Total:	49,746.89	1.142031				**983.88**	0.00	**983.88**
Not Physical Structure VR-E	impervious developed	150,264.18	3.449591	23.06	2.28	1839	6,343.80		
	pervious developed	431,023.20	9.894931	20.72	0.84	264.96	2,621.76		
	Total:	581,287.39	13.34452				**8,965.56**	0.00	**8,965.56**
Not Physical Structure VR-F	impervious developed	51,044.23	1.171814	23.06	2.28	1839	2,154.97		
	pervious developed	121,689.37	2.793604	20.72	0.84	264.96	740.19		
	Total:	172,733.60	3.965418				**2,895.16**	0.00	**2,895.16**
Not Physical Structure VR-G	impervious developed	22,941.59	0.526666	23.06	2.28	1839	968.54		
	pervious developed	45,416.23	1.042613	20.72	0.84	264.96	276.25		
	Total:	68,357.81	1.569279				**1,244.79**	0.00	**1,244.79**
Not Physical Structure VR-H	impervious developed	39,426.33	0.905104	23.06	2.28	1839	1,664.49		
	pervious developed	156,932.63	3.602678	20.72	0.84	264.96	954.57		
	Total:	196,358.96	4.507781				**2,619.05**	0.00	**2,619.05**
Not Physical Structure VR-I	impervious developed	77,195.58	1.772167	23.06	2.28	1839	3,259.01		
	pervious developed	199,951.09	4.590245	20.72	0.84	264.96	1,216.23		
	Total:	277,146.66	6.362412				**4,475.25**	0.00	**4,475.25**
Not Physical Structure VR-J	impervious developed	36,015.12	0.826793	23.06	2.28	1839	1,520.47		
	pervious developed	63,977.07	1.468711	20.72	0.84	264.96	389.15		
	Total:	99,992.19	2.295505				**1,909.62**	0.00	**1,909.62**
Not Physical Structure VR-K	impervious developed	57,985.70	1.331169	23.06	2.28	1839	2,448.02		
	pervious developed	154,494.51	3.546706	20.72	0.84	264.96	939.74		
	Total:	212,480.21	4.877874				**3,387.75**	0.00	**3,387.75**
Not Physical Structure VR-L	impervious developed	118,236.86	2.714345	23.06	2.28	1839	4,991.68		
	pervious developed	289,631.22	6.649018	20.72	0.84	264.96	1,761.72		
	Total:	407,868.08	9.363363				**6,753.40**	0.00	**6,753.40**
Not Physical Structure VR-M	impervious developed	20,864.55	0.478984	23.06	2.28	1839	880.85		
	pervious developed	46,451.94	1.06639	20.72	0.84	264.96	282.55		
	Total:	67,316.48	1.545374				**1,163.40**	0.00	**1,163.40**

[A] Sewershed	[B] Category	[C] Area (sq. ft)	[D] Area (acres)	Loading Rates for Delaware County			[H] Existing Sediment Loading w/o BMPs (lbs/yr) [D x G]	[I] Existing BMP Sediment Loading (lbs/yr)	[J] Final Existing Sediment Loading (lbs/yr) [H-I]
				[E] TN lbs/acre/yr	[F] TP lbs/acre/yr	[G] TSS (Sediment) lbs/acre/yr			
Observation Point OP-8	impervious developed	101,515.96	2.330486	23.06	2.28	1839	4,285.76		
	pervious developed	267,625.19	6.143829	20.72	0.84	264.96	1,627.87		
	Total:	369,141.14	8.474315				**5,913.63**	0.00	**5,913.63**
Observation Point OP-12	impervious developed	189,960.08	4.360883	23.06	2.28	1839	8,019.66		
	pervious developed	470,943.64	10.81138	20.72	0.84	264.96	2,864.58		
	Total:	660,903.71	15.17226				**10,884.25**	0.00	**10,884.25**
Observation Point OP-13	impervious developed	29,870.70	0.685737	23.06	2.28	1839	1,261.07		
	pervious developed	84,346.85	1.936337	20.72	0.84	264.96	513.05		
	Total:	114,217.56	2.622074				**1,774.12**	0.00	**1,774.12**
								Vernon Run Total:	**136,353.59**

Appendix 8

DEP's BMP Effectiveness Values document

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
STORMWATER DISCHARGES FROM
SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS
BMP EFFECTIVENESS VALUES

This table of BMP effectiveness values (i.e., pollutant removal efficiencies) is intended for use by MS4s that are developing and implementing Pollutant Reduction Plans and TMDL Plans to comply with NPDES permit requirements. The values used in this table generally consider pollutant reductions from both overland flow and reduced downstream erosion, and are based primarily on average values within the Chesapeake Assessment Scenario Tool (CAST) (www.casttool.org). Design considerations, operation and maintenance, and construction sequences should be as outlined in the Pennsylvania Stormwater BMP Manual, Chesapeake Bay Program guidance, or other technical sources. The Department of Environmental Protection (DEP) will update the information contained in this table as new information becomes available. Interested parties may submit information to DEP for consideration in updating this table to DEP's MS4 resource account, RA-EPPAMS4@pa.gov. Where an MS4 proposes a BMP not identified in this document or in Chesapeake Bay Program expert panel reports, other technical resources may be consulted for BMP effectiveness values. Note – TN = Total Nitrogen and TP = Total Phosphorus.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Wet Ponds and Wetlands	20%	45%	60%	A water impoundment structure that intercepts stormwater runoff then releases it to an open water system at a specified flow rate. These structures retain a permanent pool and usually have retention times sufficient to allow settlement of some portion of the intercepted sediments and attached nutrients/toxics. Until recently, these practices were designed specifically to meet water quantity, not water quality objectives. There is little or no vegetation living within the pooled area nor are outfalls directed through vegetated areas prior to open water release. Nitrogen reduction is minimal.
Dry Detention Basins and Hydrodynamic Structures	5%	10%	10%	Dry Detention Ponds are depressions or basins created by excavation or berm construction that temporarily store runoff and release it slowly via surface flow or groundwater infiltration following storms. Hydrodynamic Structures are devices designed to improve quality of stormwater using features such as swirl concentrators, grit chambers, oil barriers, baffles, micropools, and absorbent pads that are designed to remove sediments, nutrients, metals, organic chemicals, or oil and grease from urban runoff.
Dry Extended Detention Basins	20%	20%	60%	Dry extended detention (ED) basins are depressions created by excavation or berm construction that temporarily store runoff and release it slowly via surface flow or groundwater infiltration following storms. Dry ED basins are designed to dry out between storm events, in contrast with wet ponds, which contain standing water permanently. As such, they are similar in construction and function to dry detention basins, except that the duration of detention of stormwater is designed to be longer, theoretically improving treatment effectiveness.

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.
Filtering Practices	40%	60%	80%	Practices that capture and temporarily store runoff and pass it through a filter bed of either sand or an organic media. There are various sand filter designs, such as above ground, below ground, perimeter, etc. An organic media filter uses another medium besides sand to enhance pollutant removal for many compounds due to the increased cation exchange capacity achieved by increasing the organic matter. These systems require yearly inspection and maintenance to receive pollutant reduction credit.
Filter Strip Runoff Reduction	20%	54%	56%	Urban filter strips are stable areas with vegetated cover on flat or gently sloping land. Runoff entering the filter strip must be in the form of sheet-flow and must enter at a non-erosive rate for the site-specific soil conditions. A 0.4 design ratio of filter strip length to impervious flow length is recommended for runoff reduction urban filter strips.
Filter Strip Stormwater Treatment	0%	0%	22%	Urban filter strips are stable areas with vegetated cover on flat or gently sloping land. Runoff entering the filter strip must be in the form of sheet-flow and must enter at a non-erosive rate for the site-specific soil conditions. A 0.2 design ratio of filter strip length to impervious flow length is recommended for stormwater treatment urban filter strips.
Bioretention – Raingarden (C/D soils w/ underdrain)	25%	45%	55%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has an underdrain and is in C or D soil.
Bioretention / Raingarden (A/B soils w/ underdrain)	70%	75%	80%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has an underdrain and is in A or B soil.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Bioretention / Raingarden (A/B soils w/o underdrain)	80%	85%	90%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has no underdrain and is in A or B soil.
Vegetated Open Channels (C/D Soils)	10%	10%	50%	Open channels are practices that convey stormwater runoff and provide treatment as the water is conveyed, includes bioswales. Runoff passes through either vegetation in the channel, subsoil matrix, and/or is infiltrated into the underlying soils. This BMP has no underdrain and is in C or D soil.
Vegetated Open Channels (A/B Soils)	45%	45%	70%	Open channels are practices that convey stormwater runoff and provide treatment as the water is conveyed, includes bioswales. Runoff passes through either vegetation in the channel, subsoil matrix, and/or is infiltrated into the underlying soils. This BMP has no underdrain and is in A or B soil.
Bioswale	70%	75%	80%	With a bioswale, the load is reduced because, unlike other open channel designs, there is now treatment through the soil. A bioswale is designed to function as a bioretention area.
Permeable Pavement w/o Sand or Veg. (C/D Soils w/ underdrain)	10%	20%	55%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, no sand or vegetation and is in C or D soil.
Permeable Pavement w/o Sand or Veg. (A/B Soils w/ underdrain)	45%	50%	70%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, no sand or vegetation and is in A or B soil.
Permeable Pavement w/o Sand or Veg. (A/B Soils w/o underdrain)	75%	80%	85%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has no underdrain, no sand or vegetation and is in A or B soil.
Permeable Pavement w/ Sand or Veg. (A/B Soils w/ underdrain)	50%	50%	70%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, has sand and/or vegetation and is in A or B soil.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Permeable Pavement w/ Sand or Veg. (A/B Soils w/o underdrain)	80%	80%	85%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has no underdrain, has sand and/or vegetation and is in A or B soil.
Permeable Pavement w/ Sand or Veg. (C/D Soils w/ underdrain)	20%	20%	55%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, has sand and/or vegetation and is in C or D soil.
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.
Forest Buffers	25%	50%	50%	An area of trees at least 35 feet wide on one side of a stream, usually accompanied by trees, shrubs and other vegetation that is adjacent to a body of water. The riparian area is managed to maintain the integrity of stream channels and shorelines, to reduce the impacts of upland sources of pollution by trapping, filtering, and converting sediments, nutrients, and other chemicals. Effectiveness credit for TN is for 4 upslope acres for each acre of buffer (4:1), and 2 upslope acres for TP and sediment (2:1). Additional credit is gained by converting land use from current use to forest. (Note – the values represent pollutant load reductions from stormwater draining through buffers).
Tree Planting	10%	15%	20%	The BMP effectiveness values for tree planting are estimated by DEP. DEP estimates that 100 fully mature trees of mixed species (both deciduous and non-deciduous) provide pollutant load reductions for the equivalent of one acre (i.e., one mature tree = 0.01 acre). The BMP effectiveness values given are based on immature trees (seedlings or saplings); the effectiveness values are expected to increase as the trees mature. To determine the amount of pollutant load reduction that can credited for tree planting efforts: 1) multiply the number of trees planted by 0.01; 2) multiply the acreage determined in step 1 by the pollutant loading rate for the land prior to planting the trees (in lbs/acre/year); and 3) multiply the result of step 2 by the BMP effectiveness values given.
Street Sweeping	3%	3%	9%	Street sweeping must be conducted 25 times annually. Only count those streets that have been swept at least 25 times in a year. The acres associated with all streets that have been swept at least 25 times in a year would be eligible for pollutant reductions consistent with the given BMP effectiveness values.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Storm Sewer System Solids Removal	0.0027 for sediment, 0.0111 for organic matter	0.0006 for sediment, 0.0012 for organic matter	1 – TN and TP concentrations	This BMP (also referred to as "Storm Drain Cleaning") involves the collection or capture and proper disposal of solid material within the storm system to prevent discharge to surface waters. Examples include catch basins, stormwater inlet filter bags, end of pipe or outlet solids removal systems and related practices. Credit is authorized for this BMP only when proper maintenance practices are observed (i.e., inspection and removal of solids as recommended by the system manufacturer or other available guidelines). The entity using this BMP for pollutant removal credits must demonstrate that they have developed and are implementing a standard operating procedure for tracking the material removed from the sewer system. Locating such BMPs should consider the potential for backups onto roadways or other areas that can produce safety hazards. To determine pollutant reductions for this BMP, these steps must be taken: 1) Measure the weight of solid/organic material collected (lbs). Sum the total weight of material collected for an annual period. Note – do not include refuse, debris and floatables in the determination of total mass collected. 2) Convert the annual wet weight captured into annual dry weight (lbs) by using site-specific measurements (i.e., dry a sample of the wet material to find its weight) or by using default factors of 0.7 (material that is predominantly wet sediment) or 0.2 (material that is predominantly wet organic matter, e.g., leaf litter). 3) Multiply the annual dry weight of material collected by default or site-specific pollutant concentration factors. The default concentrations are shown in the BMP Effectiveness Values columns. Alternatively, the material may be sampled (at least annually) to determine site-specific pollutant concentrations. DEP will allow up to 50% of total pollutant reduction requirements to be met through this BMP. The drainage area treated by this BMP may be no greater than 0.5 acre unless it can be demonstrated that the specific system proposed is capable of treating stormwater from larger drainage areas. For planning purposes, the sediment removal efficiency specified by the manufacturer may be assumed, but no higher than 80%.

Appendix 9

Existing and Planned BMP Map