East Earl Township

MS4 Program

Pollutant Reduction Plan (PRP)

For

Conestoga River (Appendix E)

2018 – 2023 MS4 Permit

July 2018

ARRO Project No. 10714.26

ARRO Consulting, Inc.
108 West Airport Road
Lititz, PA 17543
717-569-7021

TABLE OF CONTENTS

1. INTRODUCTION

East Earl Township, Lancaster County was classified as an urbanized area per the 2010 U.S. Census. The Pennsylvania Department of Environmental Protection (PA DEP) has notified the Township that they are required to renew the National Pollutant Discharge Elimination System (NPDES) Small Municipal Separate Storm Sewer Systems (MS4) permit. The requirements for East Earl Township are defined by the PA DEP Ms4 requirements as:

MS4 Name	NPDES ID	Individual Permit Required?	Reason	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment
Lancaster County						
EAST EARL TWP	PAI133519	Yes	SP, IP	Unnamed Tributaries to Cedar Creek	Appendix E-Siltation (5)	
				Shirks Run	Appendix E-Siltation (5)	
				Mill Creek	Appendix B-Pathogens (5), Appendix E-Nutrients, Siltation (5)	
				Conestoga River	Appendix E-Nutrients, Siltation (5)	
				Cedar Creek	Appendix E-Nutrients (5)	
				Chesapeake Bay Nutrients/Sediment	Appendix D-Nutrients, Siltation (4a)	

PADEP has published the pollutant Aggregation suggestions for MS4 municipal requirements table; per the aggregation instructions, the aggregate total required reduction may be analyzed and BMP's may be implemented in the identified watersheds, tributary to the same HUC 12 watershed. The aggregated requirements for East Earl Township are:

MS4 Name	NPDES ID	HUC 12 Name	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)
Lancaster County				
EAST EARL TWP	PAI133519	Middle Conestoga River, Muddy Creek, Muddy Run-Mill Creek, Upper Conestoga River	Cedar Creek, Chesapeake Bay Nutrien	Appendix D-Siltation/Nutrients, Appendix E-Nutrients, Siltation
		Muddy Run-Mill Creek	Mill Creek	Appendix B-Pathogens
		Middle Conestoga River, Muddy Run-Mill Creek, Upper Conestoga River	Cedar Creek, Conestoga River, Mill Creek, Shirks Run, Unnamed Tributaries to Cedar Creek	Appendix E-Nutrients, Siltation
		Middle Conestoga River, Muddy Creek, Muddy Run-Mill Creek, Upper Conestoga River	Cedar Creek, Chesapeake Bay Nutrients\Sediment, Conestoga River, Mill Creek, Shirks Run, Unnamed Tributaries to Cedar Creek	Appendix D-Siltation/Nutrients, Appendix E-Nutrients, Siltation

This combined Pollutant Reduction Plan (PRP) has been developed to satisfy the requirements of: PRP for Conestoga River

2. POLLUTANT REDUCTION PLAN (PRP)

A. Public Participation

East Earl Township encouraged a plan that included public participation and buy in. It discussed the PRP at its regular meeting on September 11, 2018. Additionally, the Township publicly

advertised notice of public review, 30 day comment period, and public meeting in the *Daily Local News* on August 1, 2018; a copy of the advertisement is located in Appendix A.

A hard copy of the PRP was also made available at the Township office during normal business hours.

The Township would like to acknowledge the valuable input received from the public, the Board of Supervisors, and the Township staff in the development of the PRP. This PRP reflects careful planning of the Township with respect to the impaired waters of the commonwealth, local flooding, erosion problems, and the financial impact to the residents.

B. Map

In accordance with PA DEP guidelines for development of the PRP, the Township has completed mapping of the regulated MS4 Storm Sewer Sheds; the required mapping is provided in Appendix E. Mapping of the Township was broken out into a series of mapping, consistent with the design process for the development of the PRP. This methodology also provides for clarity of the data being presented. The mapping includes the following:

- East Earl Township MS4 Conveyance System – includes collection and conveyance to the regulated outfalls, identifies outfall, outfall location with latitude and longitude, and waters of the commonwealth and Chapter 93 designation.
- East Earl Township Attaining/Non-Attaining Streams – defines streams attainment status and associated impairment.
- East Earl Township MS4 Drainage Area Land Use – defines land use based upon zoning to assist in determination of land use contribution to local impairments.
- East Earl Township MS4 Drainage Area Analysis – provides topographic map utilized in determining storm sewer shed to outfalls.
- East Earl Township MS4 Drainage Area Impervious/Pervious Analysis – provides aerial mapping utilizing Geographic Information System (GIS) data to identify the drainage area and amount of impervious area within each storm sewer shed.
- East Earl Township MS4 Drainage Area Runoff Rate and Volume Analysis – provides rate and volume of runoff per storm sewer shed to identify potential local flooding issues.
- East Earl Township Municipal Storm Sewer Shed – provides a comparison of the 2010 Census Urbanized Area boundary to define regulated MS4 outfalls and the portion of the storm sewer sheds that the Township is responsible for.
- East Earl Township Existing BMP Structures – identifies existing Best Management Practices accounted for in the reduction of the base pollutant loading.
- East Earl Township Geology – in combination with NRCS soils data, geology is evaluated for the suitability for potential BMP implementation.
- East Earl Township Potential BMP Structures – provides identification of potential BMPs identified by the Township that were evaluated.
- East Earl Township Proposed BMP Structures – provides identification of the selected BMPs identified by the Township for implementation.

C. Pollutants of Concern

East Earl Township, in accordance with the PA DEP Municipal requirements table and the impaired waters mapping provided herein, is subject to Appendix E of the MS4 permit.

Appendix E – Conestoga River

Appendix E is the requirement for development of a Pollutant Reduction Plan (PRP) for the identified impaired waterway. East Earl Township is responsible for developing a PRP for Conestoga River to address siltation. In accordance with the PRP guidelines, the goal of the PRP is for the following reductions:

- 3% reduction of Total Nitrogen (TN)
- 5% reduction of Total Phosphorous (TP)
- 10% reduction of Sediment (TSS)

Furthermore, the PA DEP PRP instructions state: "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 impaired is due to both siltation and nutrients, both sediment (10% reduction) and TP (5% reduction) must be addressed." The PRP has been prepared to meet the required 10% reduction of sediment.

D. Existing Loading for Pollutants of Concern

Based upon the storm sewer shed delineation, the existing loading for TSS, TP and TN was calculated for each storm sewer shed. Since East Earl Township is subject to the requirements of Appendix E, the pollutant loading for the storm sewer sheds tributary to Conestoga River were calculated separately. Pollutant loadings were calculated based upon PA DEP's "Developed Land Loading Rates for PA Counties" (Attachment B of the PRP instructions) for Lancaster County; the calculated pollutant loadings are provided in Appendix F. The calculations are summarized below:

East Earl Township

Base Pollutant Loading (No Existing BMPs) Summary: Conestoga River

	Drainage Area (Ac)			PA DEP Land Loading		
Drainage Area ID	Impervious	Pervious	Total	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Conestoga River	321.52	927.21	1,248.73	33,009.25	832.15	653,018.79

D.1. Existing BMP Load Reductions

Based upon the mapping (see Attachment E), East Earl Township identified existing BMPs that would reduce the existing pollutant loading. Attachment E provides a summary of the existing BMPs, along with ownership, operation and maintenance requirements. The percent of pollutant

reductions for each BMP was determined based upon the recommendation reports of the Chesapeake Bay Expert Panel. The existing BMP pollutant load reduction calculations are provided in Attachment G. The existing loading for TSS, TP and TN was re-calculated for each storm sewer shed accounting for the pollutant load reduction from the existing BMPs, see Attachment H. The design base pollutant loading and required pollutant reduction goal is summarized below:

East Earl Township
Base Pollutant Loading With Existing BMPs Summary:

	Drainage Area (Ac)			PA DEP Land Loading		
Drainage Area ID	**Impervious**	**Pervious**	**Total**	**TN (lbs/year)**	**TP (lbs/year)**	**TSS (lbs/year)**
Conestoga River	321.52	927.21	1,248.73	33,009.25	832.15	653,018.79
BMP Reductions				323.36	17.38	14,126.65
Base Pollutant Loading With Existing BMPs				**32,685.89**	**814.77**	**638,892.14**
Required Reduction Percent				**3%**	5%	10%
Required Reduction (Lbs/Year)				**980.58**	**40.74**	**63,889.21**
Required Reduction (Tons/Year)				0.49	0.02	31.94

E. Selected BMP's

East Earl Township developed a potential BMP concept plan to identify potential BMPs to be implemented, see Attachment E. The associated pollutant loading reductions for each BMP were calculated and are provided in Attachment I; a summary description of the potential BMPs evaluated is also provided in Attachment I. The percent of pollutant reductions for each BMP were determined based upon the recommendation reports of the Chesapeake Bay Expert Panel, PA DEP BMP Effectiveness Value table, and manufacture literature including independent laboratory testing (appropriate manufacture data is provided in Attachment J).

East Earl Township evaluated the following factors in selection of the BMPs to be implemented achieve the required pollutant load reduction. These factors included:

- Return-on-investment for dollar per pound of pollutant removed (See Appendix M)
- Overall BMP cost (see Appendix L)
- Secured grant funding
- Availability of land to implement BMPs
- Local flooding and erosion problems
- Drainage areas associated with identified waterways
- Consistency with Economic Development initiatives

Based upon the potential BMP evaluation, East Earl Township developed the proposed BMPs to be implemented under the MS4 permit from 2018 – 2023. The proposed BMPs are identified on Map 11: East Earl Township Proposed BMP Structures. The proposed BMP pollutant reduction is summarized below and in attachment K:

Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Proposed BMP Pollutant Reduction

Drainage Area ID	Prop. BMP ID	BMP Description	Pollutant Reduction		
			TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
BMP OP041-001	BMP OP041-001	Bioswale	1,732.39	47.14	34,676.99
BMP OP022-001	BMP OP022-001	Bioswale	2,425.57	72.16	55,677.04
BMP 002-BR1	BMP 002-BR1	Wet-Pond Basin Retrofit	231.72	19.68	21,644.59
			4,389.68	**138.98**	**111,998.63**

REQUIRED POLLUTANT REDUCTION (Lbs/Year)	**980.58**	**40.74**	**63,889.21**

F. Funding Mechanism

East Earl Township, through the planning phase, evaluated the cost associated with the selected plan; the selected BMP implementation cost is summarized below:

Selected BMP Summary

Drainage Area ID	Prop. BMP ID	BMP Description	Estimate Project Total
BMP OP041-001	BMP OP041-001	Bioswale	$103,080.96
BMP OP022-001	BMP OP022-001	Bioswale	$194,150.40
			$297,231.36

East Earl Township, in the 2019 budget through the 2024 budget, will include a separate line item in the General Fund for MS4 and PRP compliance. The General Fund revenues are based upon the Township's tax base, as regulated under the Second Class Township Code.

The Township's staff continues to evaluate potential grant funding opportunities and apply for project specific grants.

G. Responsible Parties for Operation and Maintenance (O&M) of BMPs

Some of the BMPs identified in the PRP are located on Township property or within the right of way. Accordingly, East Earl Township will own and operate those BMPS. Some of the BMPs identified in the PRP are located on private property. Accordingly, the Township will develop

access and maintenance agreements for those BMPs. Specific requirements for each BMP are identified below:

Appendix E – Conestoga River:

BMP OP041-001: Bioswale:

Location: Near west side of Witmer Road.

Responsible Party: East Earl Township

O&M Activities: Monitor storm sewer discharge areas and swale banks for scouring and erosion, immediately stabilized any areas of erosion. Maintain vegetation in natural state, where appropriate. Remove any invasive species that may develop.

Frequency of

O&M Activities: Complete inspection of the restored corridor a minimum of once a year. Complete restoration and/or selective vegetation

BMP OP022-001: Bioswale:

Location: Near Division Highway, East of Springville Road, and terminate near Cedar Creek

Responsible Party: East Earl Township

O&M Activities: Monitor storm sewer discharge areas and swale banks for scouring and erosion, immediately stabilized any areas of erosion. Maintain vegetation in natural state, where appropriate. Remove any invasive species that may develop.

Frequency of

O&M Activities: Complete inspection of the restored corridor a minimum of once a year. Complete restoration and/or selective vegetation

H. PRP Implementation Schedule

Task	Implementation Date
MS4 Permit Authorization	March 2019
BMP OP041-001: Bioswale:	November 2019
BMP OP022-001: Bioswale:	November 2019
MS4 Permit Expiration	March 2024

ATTACHMENT A

PUBLIC NOTICE

NOTICE OF PUBLIC COMMENT PERIOD AND PUBLIC MEETING FOR NPDES STORMWATER DISCHARGE POLLUTANT REDUCTION PLAN

East Earl Township is hereby giving notice of the 30-day public comment period for its National Pollutant Discharge Elimination (NPDES) Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) Pollutant Reduction Plan (PRP). The Plan proposes best management practices to satisfy the PRP requirements for the following impaired waterways: Cedar Creek, Conestoga River, Mill Creek, Shirks Run, Unnamed Tributaries to Cedar Creek (Appendix D- Siltation/Nutrients, Appendix E-Nutrients, Siltation)

The public is invited to review these documents and provide written comments to the individual listed below:

Terry L. Kauffman
Interim Township Manager
East Earl Township
4610 Division Highway
East Earl, PA 17519
717-354-5593 Extension 24

Office Hours are 8:00 am to 4:30 pm Monday through Thursday, 8:00 am to noon Friday. It can also be viewed on the Township's website at https://www.eastearltwp.org.

The 30-day public comment period will begin on 8/1/2018 and end 8/31/18. A public meeting for the plan will be held on 9/11/18 during the regularly scheduled Township Board of Supervisors meeting at Township Office
4610 Division Highway, East Earl, PA 17519, 7:00 pm.

ATTACHMENT B

WRITTEN PUBLIC COMMENTS

ATTACHMENT C

PUBLIC MEETING COMMENTS

ATTACHMENT D

RECORD OF CONSIDERATION OF ALL TIMELY COMMENTS RECEIVED

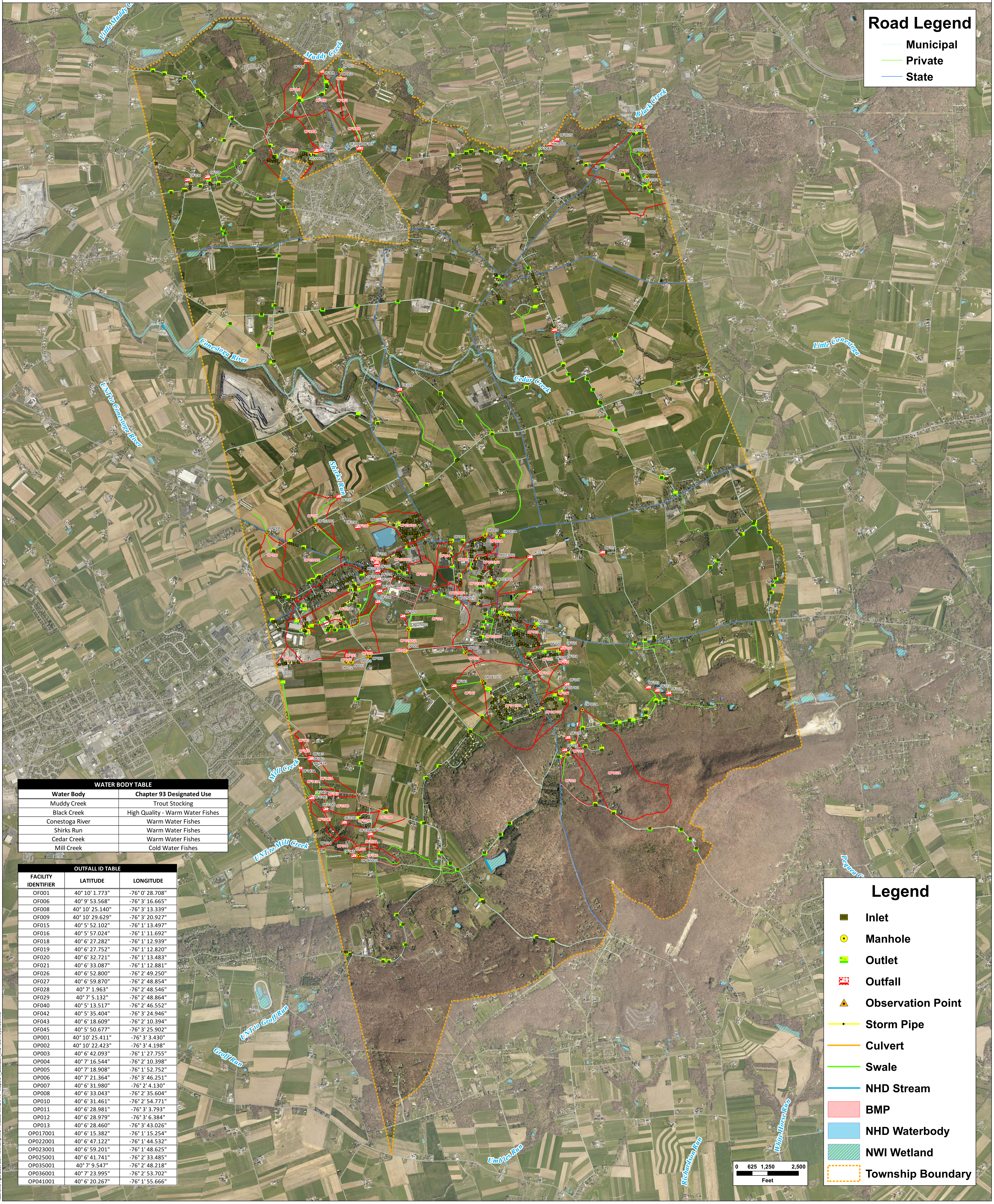
ATTACHMENT E

MAPPING

MAP INDEX

East Earl Township

MS4 Conveyance System



WATER BODY TABLE

Water Body	Chapter 93 Designated Use
Muddy Creek	Trout Stocking
Black Creek	High Quality - Warm Water Fishes
Conestoga River	Warm Water Fishes
Shirks Run	Warm Water Fishes
Cedar Creek	Warm Water Fishes
Mill Creek	Cold Water Fishes

OUTFALL ID TABLE

FACILITY IDENTIFIER	LATITUDE	LONGITUDE
OF001	40° 10' 1.773"	-76° 0' 28.708"
OF006	40° 9' 53.568"	-76° 3' 16.665"
OF008	40° 10' 25.140"	-76° 3' 13.339"
OF009	40° 10' 29.629"	-76° 3' 20.927"
OF015	40° 5' 52.102"	-76° 1' 13.497"
OF016	40° 5' 57.024"	-76° 1' 11.692"
OF018	40° 6' 27.282"	-76° 1' 12.939"
OF019	40° 6' 27.752"	-76° 1' 12.820"
OF020	40° 6' 32.721"	-76° 1' 13.483"
OF021	40° 6' 33.087"	-76° 1' 12.881"
OF026	40° 6' 52.800"	-76° 2' 49.250"
OF027	40° 6' 59.870"	-76° 2' 48.854"
OF028	40° 7' 1.963"	-76° 2' 48.546"
OF029	40° 7' 5.132"	-76° 2' 48.864"
OF040	40° 5' 13.517"	-76° 2' 46.552"
OF042	40° 5' 35.404"	-76° 3' 24.946"
OF043	40° 6' 18.609"	-76° 2' 10.394"
OF045	40° 5' 50.677"	-76° 3' 25.902"
OP001	40° 10' 25.411"	-76° 3' 3.430"
OP002	40° 10' 22.423"	-76° 3' 4.198"
OP003	40° 6' 42.093"	-76° 1' 27.755"
OP004	40° 7' 16.544"	-76° 2' 10.398"
OP005	40° 7' 18.908"	-76° 1' 52.752"
OP006	40° 7' 21.364"	-76° 3' 46.251"
OP007	40° 6' 31.980"	-76° 2' 4.130"
OP008	40° 6' 33.043"	-76° 2' 35.604"
OP010	40° 6' 31.461"	-76° 2' 54.771"
OP011	40° 6' 28.981"	-76° 3' 3.793"
OP012	40° 6' 28.979"	-76° 3' 6.384"
OP013	40° 6' 28.460"	-76° 3' 43.026"
OP017001	40° 6' 15.382"	-76° 1' 15.254"
OP022001	40° 6' 47.122"	-76° 1' 44.532"
OP023001	40° 6' 59.201"	-76° 1' 48.625"
OP025001	40° 6' 41.741"	-76° 2' 33.485"
OP035001	40° 7' 9.547"	-76° 2' 48.218"
OP036001	40° 7' 23.995"	-76° 2' 53.702"
OP041001	40° 6' 20.267"	-76° 1' 55.666"

\\Lancfile4\gis\East Earl Township\MS4 Master\MXD\PRP Maps\01_EastEarl_MS4Conveyance.mxd

East Earl Township

Attaining/Non-Attaining Streams

N

Water Body	Attaining	Non-Attaining	Impairment
Unnamed Tributaries to Cedar Creek	No	Yes	Appendix E - Siltation (5)
Shirks Run	No	Yes	Appendix E - Siltation (5)
Mill Creek	No	Yes	Appendix B - Pathogens (5), Appendix E - Nutrients, Siltation (5)
Conestoga River	No	Yes	Appendix E-Nutrients, Siltation (5)
Cedar Creek	No	Yes	Appendix E - Nutrients (5)
Chesapeake Bay Nutrients/Sediment	No	Yes	Appendix D-Nutrients, Siltation (4a)

Legend

- Inlet
- Manhole
- Outlet
- Outfall
- Observation Point
- Storm Pipe
- Culvert
- Swale
- Non-Attaining Stream
- BMP
- MS3 Drainage Area
- NHD Waterbody
- NWI Wetland
- Township Boundary

0 625 1,250 2,500
Feet

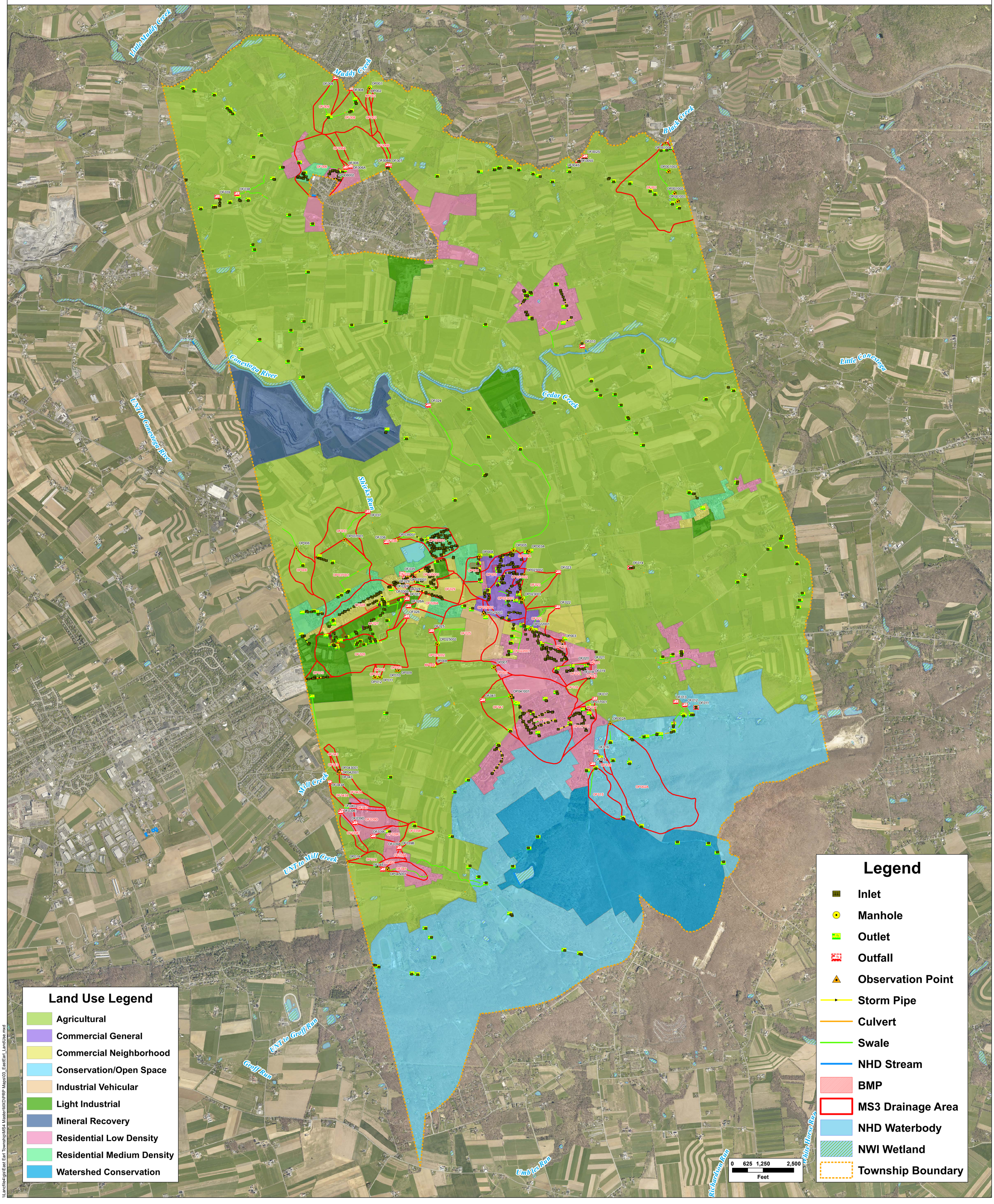
\\Landfile1\gis\East Earl Township\MS4 Master\MXD\PRP Maps\02_EastEarl_Streams.mxd

East Earl Township

MS3 Drainage Areas & Land Use

N

ARRO



Land Use Legend

- Agricultural
- Commercial General
- Commercial Neighborhood
- Conservation/Open Space
- Industrial Vehicular
- Light Industrial
- Mineral Recovery
- Residential Low Density
- Residential Medium Density
- Watershed Conservation

Legend

- Inlet
- Manhole
- Outlet
- Outfall
- Observation Point
- Storm Pipe
- Culvert
- Swale
- NHD Stream
- BMP
- MS3 Drainage Area
- NHD Waterbody
- NWI Wetland
- Township Boundary

\\Landfile4\gis\East Earl Township\MS4 Master\MXD\PRP Maps\03_EastEarl_LandUse.mxd

East Earl Township

MS3 Drainage Area Analysis

N

ARRO

Little Muddy Creek
Muddy Creek
Black Creek
Conestoga River
UNT to Conestoga River
Cedar Creek
Little Conestoga
Shirks Run
Mill Creek
UNT to Mill Creek
UNT to Groff Run
Groff Run
Umbles Run
Richardson Run
White Horse Run

Contour Legend

- Index Contours
- Index Depression Contours
- Intermediate Contours
- Intermediate Depression Contours

Legend

- Inlet
- Manhole
- Outlet
- Outfall
- Observation Point
- Storm Pipe
- Culvert
- Swale
- NHD Stream
- BMP
- MS3 Drainage Area
- NHD Waterbody
- NWI Wetland
- Township Boundary

0 625 1,250 2,500
Feet

\\Landfile4\gis\East Earl Township\MS4 Master\MXD\PRP Maps\04_EastEarl_Contours.mxd

East Earl Township

MS3 Drainage Area Pervious/Impervious Analysis

Drainage Area ID	Drainiage Area (SF)			Drainage Area (AC)			% Impervious
	Impervious	Pervious	Total	Impervious	Pervious	Total	
OF001	572,824.00	7,045,209.00	7,618,033.00	13.150	161.736	174.886	8%
OF006	593,631.00	3,319,188.00	3,912,819.00	13.628	76.198	89.826	15%
OF008	203,198.00	1,829,110.00	2,032,308.00	4.665	41.991	46.655	10%
OF009	61,825.00	1,104,581.00	1,166,406.00	1.419	25.358	26.777	5%
OF015	87,123.00	1,467,539.00	1,554,662.00	2.000	33.690	35.690	6%
OF016	11,898.00	164,892.00	176,790.00	0.273	3.785	4.059	7%
OF018	84,509.00	225,213.00	309,722.00	1.940	5.170	7.110	27%
OF019	4,302.10	646.00	4,948.10	0.099	0.015	0.114	87%
OF020	287,190.75	616,449.00	903,639.75	6.593	14.152	20.745	32%
OF021	5,405.97	11,894.00	17,299.97	0.124	0.273	0.397	31%
OF026	1,074,448.92	3,779,507.00	4,853,955.92	24.666	86.766	111.431	22%
OF027	318,032.40	2,287,372.00	2,605,404.40	7.301	52.511	59.812	12%
OF028	1,217,738.55	1,720,889.00	2,938,627.55	27.955	39.506	67.462	41%
OF029	242,703.81	1,059,964.00	1,302,667.81	5.572	24.333	29.905	19%
OF040	82,544.77	159,682.00	242,226.77	1.895	3.666	5.561	34%
OF042	42,318.24	182,943.00	225,261.24	0.971	4.200	5.171	19%
OF043	18,673.88	69,922.00	88,595.88	0.429	1.605	2.034	21%
OF045	21,332.82	65,068.00	86,400.82	0.490	1.494	1.983	25%
OP001	10,107.73	9,408.00	19,515.73	0.232	0.216	0.448	52%
OP002	5,329.63	4,015.00	9,344.63	0.122	0.092	0.215	57%
OP003	49699.13	137993.00	187692.13	1.14	3.168	4.309	26%
OP004	211557.43	374724.00	586281.43	4.86	8.602	13.459	36%
OP005	941039.86	875417.00	1816456.86	21.60	20.097	41.700	52%
OP006	34733.07	1083709.00	1118442.07	0.80	24.879	25.676	3%
OP007	56973.88	126992.00	183965.88	1.31	2.915	4.223	31%
OP008	2657.94	19321.00	21978.94	0.06	0.444	0.505	12%
OP009	3515.19	12152.00	15667.19	0.08	0.279	0.360	22%
OP010	5918.94	10463.00	16381.94	0.14	0.240	0.376	36%
OP011	15332.93	2228.00	17560.93	0.35	0.051	0.403	87%
OP012	4883.67	22959.00	27842.67	0.11	0.527	0.639	18%
OP013	355825.81	55488.00	411313.81	8.17	1.274	9.442	87%
OP017001	195597.63	998319.00	1193916.63	4.49	22.918	27.409	16%
OP022001	1939006.42	3722458.00	5661464.42	44.51	85.456	129.969	34%
OP023001	1137719.37	1054647.00	2192366.37	26.12	24.211	50.330	52%
OP025001	60735.81	34681.00	95416.81	1.39	0.796	2.190	64%
OP035001	650829.17	500521.00	1151350.17	14.94	11.490	26.431	57%
OP036001	549387.66	1190003.00	1739390.66	12.61	27.319	39.931	32%
OP037001	319513.67	4358088.00	4677601.67	7.34	100.048	107.383	7%
OP041001	1188114.91	6081033.00	7269147.91	27.28	139.601	166.877	16%

Legend

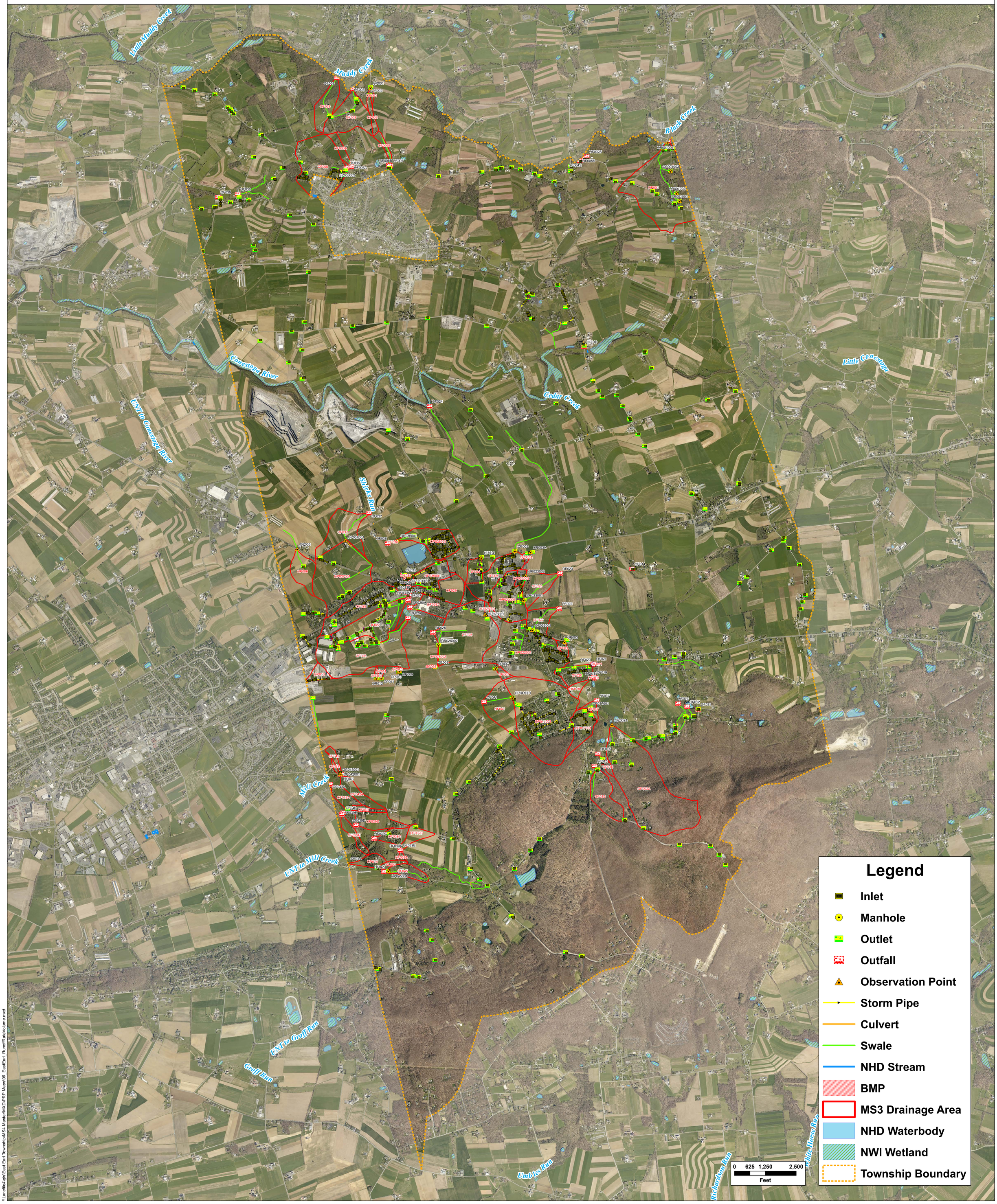
- Inlet
- Manhole
- Outlet
- Outfall
- Observation Point
- Storm Pipe
- Culvert
- Swale
- NHD Stream
- BMP
- MS3 Drainage Area
- NHD Waterbody
- NWI Wetland
- Township Boundary

0 625 1,250 2,500 Feet

\\Landfile4\gis\East Earl Township\MS4 Master\MXD\PRP Maps\05_EastEarl_PerviousImpervious.mxd

East Earl Township

MS3 Drainage Area Runoff Rate & Volume Analysis



\\Landfile4\gis\East Earl Township\MS4 Master\MXD\PRP Maps\06_EastEarl_RunoffRateVolume.mxd

East Earl Township

Municipal Storm Sewer Sheds

N

ARRO

Little Muddy Creek
Muddy Creek
Black Creek
Conestoga River
UNT to Conestoga River
Cedar Creek
Little Conestoga
Shirks Run
Mill Creek
UNT to Mill Creek
UNT to Groff Run
Groff Run
Umbles Run
Richardson Run
White Horse Run

Legend

- Inlet
- Manhole
- Outlet
- Outfall
- Observation Point
- Storm Pipe
- Culvert
- Swale
- NHD Stream
- BMP
- NHD Waterbody
- NWI Wetland
- Non-Regulated MS3
- Urbanized Area
- Township Boundary

Storm Sewer Shed Legend

- MS3 Drainage Area
- Urbanized Area

0 625 1,250 2,500
Feet

\\Landfile4\gis\East Earl Township\MS4 Master\MXD\PRP Maps\07_EastEarl_StormSewerSheds.mxd

East Earl Township

Existing Best Management Practice Structures

N

ARRO

BMP ID	Type	Location	Latitude	Longitude
BMP001	Dry Detention Basin	OF017	40° 6.231'	-76° 1.272'
BMP004	Dry Detention Basin	OG023	40° 6.990'	-76° 1.846'
BMP005	Dry Detention Basin	OF041	40° 6.222'	-76° 1.750'
BMP006	Dry Detention Basin	OF028	40° 6.855'	-76° 3.459'
BMP007	Dry Detention Basin	OF035	40° 7.133'	-76° 2.734'
BMP008	Dry Detention Basin	OP005	40° 7.039'	-76° 2.114'
BMP009	Dry Detention Basin	OF020	40° 6.525'	-76° 1.253'
BMP010	Dry Detention Basin	OF022	40° 6.682'	-76° 1.646'
BMP011	Dry Detention Basin	OF028	40° 6.943'	-76° 3.113'
BMP012/013	Dry Detention Basin	OF027	BMP012: 40° 6.959' BMP013: 40° 6.982'	BMP012: -76° 3.021' BMP013: -76° 2.939'
BMP015	Dry Detention Basin	OP005	40° 7.188'	-76° 2.037'
BMP016	Dry Detention Basin	OF026	40° 6.702'	-76° 3.232'
BMP017/025	Dry Detention Basin	OF026	BMP017: 40° 6.740' BMP025: 40° 6.718'	BMP017: -76° 3.106' BMP025: -76° 3.115'
BMP018	Dry Detention Basin	OP004	40° 7.211'	-76° 2.221'
BMP019	Dry Detention Basin	OF027	40° 6.775'	-76° 3.373'
BMP022	Dry Detention Basin	OF006	40° 9.867'	-76° 3.323'
BMP023	Dry Detention Basin	OF036	40° 7.388'	-76° 2.649'
BMP026	Dry Detention Basin	OF022	40° 6.770'	-76° 1.795'

Legend

- Inlet
- Manhole
- Outlet
- Outfall
- Observation Point
- Storm Pipe
- Culvert
- Swale
- NHD Stream
- Existing BMP
- Existing BMP Drainage Area
- NHD Waterbody
- NWI Wetland
- Township Boundary

0 625 1,250 2,500
Feet

\\Landfile4\gis\East Earl Township\MS4 Master\MXD\PRP Maps\08_EastEarl_ExistingBMPs.mxd

East Earl Township

Geology

N

ARRO

Little Muddy Creek
Muddy Creek
Black Creek
Conestoga River
UNT to Conestoga River
Cedar Creek
Little Conestoga
Shirks Run
Mill Creek
UNT to Mill Creek
UNT to Groff Run
Groff Run
Umbles Run
Richardson Run
White Horse Run

0 625 1,250 2,500
Feet

Geology Legend

- Annville Formation
- Antietam Formation
- Buffalo Springs Formation
- Chickies Formation
- Cocalico Formation
- Epler Formation
- Hammer Creek conglomerate
- Harpers Formation
- Kinzers Formation
- Ledger Formation
- New Oxford Formation
- Ontelaunee Formation
- Stonehenge Formation
- Vintage Formation
- Zooks Corner Formation

Legend

- Inlet
- Manhole
- Outlet
- Outfall
- Observation Point
- Storm Pipe
- Culvert
- Swale
- NHD Stream
- BMP
- MS3 Drainage Area
- NHD Waterbody
- NWI Wetland
- Township Boundary

\\Landfile4\gis\East Earl Township\MS4 Master\MXD\PRP Maps\09_EastEarl_Geology.mxd

East Earl Township

Potential Best Management Practice Structures

FACILITY IDENTIFIER	TYPE	LOCATION	LATITUDE	LONGITUDE
OP022001	Bioswale	OF-022	40° 10' 1.773"	-76° 0' 28.708"
OP041001	Bioswale	OF-041	40° 9' 53.568"	-76° 3' 16.665"
OP023001	Wet Pond Basin Retrofit	OF-023	40° 10' 25.140"	-76° 3' 13.339"

Potential BMP Legend

- OP022001
- OP023001
- OP041001

Legend

- Inlet
- Manhole
- Outlet
- Outfall
- Observation Point
- Storm Pipe
- Culvert
- Swale
- NHD Stream
- Potential BMP
- NHD Waterbody
- NWI Wetland
- Township Boundary

0 625 1,250 2,500
Feet

\\Landfile4\gis\East Earl Township\MS4 Master\MXD\PRP Maps\10_EastEarl_PotentialBMPs.mxd

East Earl Township

Proposed Best Management Practice Structures

PROPOSED BMP STRUCTURES				
FACILITY IDENTIFIER	TYPE	LOCATION	LATITUDE	LONGITUDE
OP022001	Bioswale	OF-022	40° 10' 1.773"	-76° 0' 28.708"
OP041001	Bioswale	OF-041	40° 9' 53.568"	-76° 3' 16.665"

Proposed BMP Drainage Area Legend

- OP022001
- OP041001

Legend

- Inlet
- Manhole
- Outlet
- Outfall
- Observation Point
- Storm Pipe
- Culvert
- Swale
- NHD Stream
- NHD Waterbody
- NWI Wetland
- Township Boundary
- Proposed BMP

0 625 1,250 2,500
Feet

\\Landfile4\gis\East Earl Township\MS4 Master\MXD\PRP Maps\11_EastEarl_ProposeBMPs.mxd

ATTACHMENT F

EXISTING LOADING FOR POLLUTANTS OF CONCERN

1. Conestoga River (Appendix E)

EXISTING LOADING FOR POLLUTANTS OF CONCERN

1. Conestoga River (Appendix E)

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Base Pollutant Loading (No Existing BMPs) Summary

East Earl Township

Base Pollutant Loading (No Existing BMPs) Summary: Conestoga River

	Drainage Area (Ac)			PA DEP Land Loading		
Drainage Area ID	**Impervious**	**Pervious**	**Total**	**TN (lbs/year)**	**TP (lbs/year)**	**TSS (lbs/year)**
Conestoga River	321.52	927.21	1,248.73	33,009.25	832.15	653,018.79

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26

Land Use: MS4 Regulated Area
Watershed Description: Conestoga River

OF-001

Description	Area (SF)	Area (Ac.)
Pervious	949,903	21.807
Impervious	136,696	3.138
		24.945

OF-006

Description	Area (SF)	Area (Ac.)
Pervious	2,489,658	57.155
Impervious	270,091	6.200
		63.355

OF-006A

Description	Area (SF)	Area (Ac.)
Pervious	29,638	0.680
Impervious	406,924	9.342
		10.022

OF-006B

Description	Area (SF)	Area (Ac.)
Pervious	193,729	4.447
Impervious	33,129	0.761
		5.208

OF-008

Description	Area (SF)	Area (Ac.)
Pervious	1,829,110	41.991
Impervious	203,198	4.665
		46.655

OF-009

Description	Area (SF)	Area (Ac.)
Pervious	1,104,581	25.358
Impervious	61,825	1.419
		26.777

OF-015

Description	Area (SF)	Area (Ac.)
Pervious	11,485	0.264
Impervious	2,999	0.069
		0.333

OF-016

Description	Area (SF)	Area (Ac.)
Pervious	23,928	0.549
Impervious	1,633	0.037
		0.587

OF-017

Description	Area (SF)	Area (Ac.)
Pervious	68,932	1.582
Impervious	21,418	0.492
		2.074

OF-018

Description	Area (SF)	Area (Ac.)
Pervious	14,122	0.324
Impervious	18,559	0.426
		0.750

OF-019

Description	Area (SF)	Area (Ac.)
Pervious	646	0.015
Impervious	3,871	0.089
		0.104

OF-020

Description	Area (SF)	Area (Ac.)
Pervious	616,449	14.152
Impervious	287,190	6.593
		20.745

OF-021

Description	Area (SF)	Area (Ac.)
Pervious	7,050	0.162
Impervious	4,496	0.103
		0.265

OF-022

Description	Area (SF)	Area (Ac.)
Pervious	0	0.000
Impervious	1,674	0.038
		0.038

OF-023

Description	Area (SF)	Area (Ac.)
Pervious	527	0.012
Impervious	6,781	0.156
		0.168

OF-025

Description	Area (SF)	Area (Ac.)
Pervious	470,910	10.811
Impervious	536,202	12.310
		23.120

OF-026

Description	Area (SF)	Area (Ac.)
Pervious	3,779,507	86.766
Impervious	1,074,448	24.666
		111.431

OF-026A

Description	Area (SF)	Area (Ac.)
Pervious	725,304	16.651
Impervious	512,452	11.764
		28.415

OF-027

Description	Area (SF)	Area (Ac.)
Pervious	2,287,372	52.511
Impervious	318,032	7.301
		59.812

OF-028

Description	Area (SF)	Area (Ac.)
Pervious	1,720,889	39.506
Impervious	1,217,738	27.955
		67.462

OF-029

Description	Area (SF)	Area (Ac.)
Pervious	1,059,964	24.333
Impervious	242,703	5.572
		29.905

OF-035

Description	Area (SF)	Area (Ac.)
Pervious	118	0.003
Impervious	240	0.006
		0.008

OF-036

Description	Area (SF)	Area (Ac.)
Pervious	334	0.008
Impervious	0	0.000
		0.008

OF-037

Description	Area (SF)	Area (Ac.)
Pervious	272,768	6.262
Impervious	10,353	0.238
		6.500

OF-039A

Description	Area (SF)	Area (Ac.)
Pervious	49,912	1.146
Impervious	10,841	0.249
		1.395

OF-039B

Description	Area (SF)	Area (Ac.)
Pervious	1,044	0.024
Impervious	3,152	0.072
		0.096

OF-039C

Description	Area (SF)	Area (Ac.)
Pervious	363,368	8.342
Impervious	100,649	2.311
		10.652

OF-039D

Description	Area (SF)	Area (Ac.)
Pervious	919,592	21.111
Impervious	113,736	2.611
		23.722

OF-039E

Description	Area (SF)	Area (Ac.)
Pervious	457,412	10.501
Impervious	16,602	0.381
		10.882

OF-040

Description	Area (SF)	Area (Ac.)
Pervious	196,506	4.511
Impervious	92,121	2.115
		6.626

OF-041

Description	Area (SF)	Area (Ac.)
Pervious	1,744	0.040
Impervious	8,862	0.203
		0.243

OF-042

Description	Area (SF)	Area (Ac.)
Pervious	166	0.004
Impervious	0	0.000
		0.004

OF-042A

Description	Area (SF)	Area (Ac.)
Pervious	133,429	3.063
Impervious	17,798	0.409
		3.472

OF-043

Description	Area (SF)	Area (Ac.)
Pervious	710	0.016
Impervious	0	0.000
		0.016

OF-043A

Description	Area (SF)	Area (Ac.)
Pervious	478,229	10.979
Impervious	52,388	1.203
		12.181

OF-045

Description	Area (SF)	Area (Ac.)
Pervious	562,037	12.903
Impervious	89,973	2.065
		14.968

OP-001

Description	Area (SF)	Area (Ac.)
Pervious	9,085	0.209
Impervious	9,925	0.228

0.436

OP-002

Description	Area (SF)	Area (Ac.)
Pervious	167,303	3.841
Impervious	22,747	0.522
		4.363

OP-002A

Description	Area (SF)	Area (Ac.)
Pervious	333,207	7.649
Impervious	138,460	3.179
		10.828

OP-003

Description	Area (SF)	Area (Ac.)
Pervious	137,993	3.168
Impervious	49,699	1.141
		4.309

OP-004

Description	Area (SF)	Area (Ac.)
Pervious	374,724	8.602
Impervious	211,557	4.857
		13.459

OP-005

Description	Area (SF)	Area (Ac.)
Pervious	839,670	19.276
Impervious	922,258	21.172
		40.448

OP-006

Description	Area (SF)	Area (Ac.)
Pervious	1,083,709	24.879
Impervious	34,733	0.797
		25.676

OP-007

Description	Area (SF)	Area (Ac.)
Pervious	126,992	2.915
Impervious	56,974	1.308
		4.223

OP-008

Description	Area (SF)	Area (Ac.)
Pervious	19,321	0.444
Impervious	2,658	0.061
		0.505

OP-009

Description	Area (SF)	Area (Ac.)
Pervious	12,152	0.279
Impervious	3,515	0.081
		0.360

OP-010

Description	Area (SF)	Area (Ac.)
Pervious	10,463	0.240
Impervious	5,919	0.136
		0.376

OP-011

Description	Area (SF)	Area (Ac.)
Pervious	74,249	1.705
Impervious	39,444	0.906
		2.610

OP-012

Description	Area (SF)	Area (Ac.)
Pervious	43,906	1.008
Impervious	5,252	0.121
		1.129

OP-013

Description	Area (SF)	Area (Ac.)
Pervious	55,488	1.274
Impervious	355,826	8.169
		9.442

OP-014

Description	Area (SF)	Area (Ac.)
Pervious	423,075	9.712
Impervious	65,144	1.496
		11.208

OP-017001

Description	Area (SF)	Area (Ac.)
Pervious	753,613	17.301
Impervious	178,104	4.089
		21.389

OP-022001

Description	Area (SF)	Area (Ac.)
Pervious	3,518,461	80.773
Impervious	1,866,562	42.850
		123.623

OP-023001

Description	Area (SF)	Area (Ac.)
Pervious	1,054,647	24.211
Impervious	1,137,719	26.118
		50.330

OP-023002

Description	Area (SF)	Area (Ac.)
Pervious	48,852	1.121
Impervious	183,213	4.206
		5.327

OP-025001

Description	Area (SF)	Area (Ac.)
Pervious	34,681	0.796
Impervious	60,736	1.394
		2.190

OP-025002

Description	Area (SF)	Area (Ac.)
Pervious	9,268	0.213
Impervious	9,579	0.220
		0.433

OP-035001

Description	Area (SF)	Area (Ac.)
Pervious	500,521	11.490
Impervious	650,829	14.941
		26.431

OP-036001

Description	Area (SF)	Area (Ac.)
Pervious	1,190,003	27.319
Impervious	549,388	12.612
		39.931

OP-037001

Description	Area (SF)	Area (Ac.)
Pervious	4,358,088	100.048
Impervious	319,514	7.335
		107.383

OP-041001

Description	Area (SF)	Area (Ac.)
Pervious	4,162,874	95.566
Impervious	1,126,665	25.865
		121.431

OL001

Description	Area (SF)	Area (Ac.)
Pervious	215,073	4.937
Impervious	19,985	0.459
		5.396

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26

Worksheet 4:
Drainage Area: Conestoga River
2-year Rainfall: 3.08 in

OF-001

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	7,045,209	161.736	77	2.99	0.60	1.13	661,559.39
Impervious	C	572,824	13.150	98	0.20	0.04	2.85	135,947.55
		7,618,033	174.886					797,506.94

OF-006

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	3,319,188	76.198	77	2.99	0.60	1.13	311,678.47
Impervious	C	593,631	13.628	98	0.20	0.04	2.85	140,885.65
		3,912,819	89.826					452,564.12

OF-006A

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	377,285	8.661	77	2.99	0.60	1.13	35,427.83
Impervious	C	29,638	0.680	98	0.20	0.04	2.85	7,033.95
		406,923	9.342					42,461.77

OF-006B

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	210,176	4.825	77	2.99	0.60	1.13	19,735.95
Impervious	C	57,889	1.329	98	0.20	0.04	2.85	13,738.72
		268,065	6.154					33,474.67

OF-008

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	1,829,110	41.991	77	2.99	0.60	1.13	171,757.13
Impervious	C	203,198	4.665	98	0.20	0.04	2.85	48,224.71
		2,032,308	46.655					219,981.84

OF-009

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	1,104,581	25.358	77	2.99	0.60	1.13	103,722.39
Impervious	C	61,825	1.419	98	0.20	0.04	2.85	14,672.84
		1,166,406	26.777					118,395.24

OF-015

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	1,467,539	33.690	77	2.99	0.60	1.13	137,804.88
Impervious	C	87,123	2.000	98	0.20	0.04	2.85	20,676.78
		1,554,662	35.690					158,481.67

OF-016

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	164,892	3.785	77	2.99	0.60	1.13	15,483.69
Impervious	C	11,898	0.273	98	0.20	0.04	2.85	2,823.74
		176,790	4.059					18,307.43

OF-017

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	195,354	4.485	77	2.99	0.60	1.13	18,344.14
Impervious	C	21,521	0.494	98	0.20	0.04	2.85	5,107.55
		216,875	4.979					23,451.69

OF-018

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	225,213	5.170	77	2.99	0.60	1.13	21,147.96
Impervious	C	84,509	1.940	98	0.20	0.04	2.85	20,056.41
		309,722	7.110					41,204.36

OF-019

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	646	0.015	77	2.99	0.60	1.13	60.66
Impervious	C	4,302	0.099	98	0.20	0.04	2.85	1,020.99
		4,948	0.114					1,081.65

OF-020

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	616,449	14.152	77	2.99	0.60	1.13	57,885.81
Impervious	C	287,190	6.593	98	0.20	0.04	2.85	68,158.42
		903,639	20.745					126,044.22

OF-021

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	11,894	0.273	77	2.99	0.60	1.13	1,116.87
Impervious	C	5,406	0.124	98	0.20	0.04	2.85	1,283.00
		17,300	0.397					2,399.87

OF-022

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	825,139	18.943	77	2.99	0.60	1.13	77,482.22
Impervious	C	64,860	1.489	98	0.20	0.04	2.85	15,393.14
		889,999	20.432					92,875.36

OF-023

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	1,185,310	27.211	77	2.99	0.60	1.13	111,303.01
Impervious	C	68,332	1.569	98	0.20	0.04	2.85	16,217.14
		1,253,642	28.780					127,520.15

OF-025

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	4,042,436	92.802	77	2.99	0.60	1.13	379,592.92
Impervious	C	779,075	17.885	98	0.20	0.04	2.85	184,896.82
		4,821,511	110.687					564,489.74

OF-026

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	3,779,507	86.766	77	2.99	0.60	1.13	354,903.36
Impervious	C	1,074,448	24.666	98	0.20	0.04	2.85	254,997.30
		4,853,955	111.431					609,900.65

OF-026A

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	725,304	16.651	77	2.99	0.60	1.13	68,107.51
Impervious	C	512,452	11.764	98	0.20	0.04	2.85	121,619.54
		1,237,756	28.415					189,727.06

OF-027

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	2,287,372	52.511	77	2.99	0.60	1.13	214,788.86
Impervious	C	318,032	7.301	98	0.20	0.04	2.85	75,478.11
		2,605,404	59.812					290,266.97

OF-028

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	1,720,889	39.506	77	2.99	0.60	1.13	161,594.96
Impervious	C	1,217,738	27.955	98	0.20	0.04	2.85	289,004.12
		2,938,627	67.462					450,599.08

OF-029

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	1,059,964	24.333	77	2.99	0.60	1.13	99,532.77
Impervious	C	242,703	5.572	98	0.20	0.04	2.85	57,600.38
		1,302,667	29.905					157,133.14

OF-035

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	13,681	0.314	77	2.99	0.60	1.13	1,284.67
Impervious	C	730	0.017	98	0.20	0.04	2.85	173.25
		14,411	0.331					1,457.92

OF-036

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	22,034	0.506	77	2.99	0.60	1.13	2,069.04
Impervious	C	561	0.013	98	0.20	0.04	2.85	133.14
		22,595	0.519					2,202.18

OF-037

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	1,958,610	44.963	77	2.99	0.60	1.13	183,917.44
Impervious	C	99,732	2.290	98	0.20	0.04	2.85	23,669.26
		2,058,342	47.253					207,586.71

OF-039A

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	64,013	1.470	77	2.99	0.60	1.13	6,010.95
Impervious	C	21,125	0.485	98	0.20	0.04	2.85	5,013.57
		85,138	1.954					11,024.52

OF-039B

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	534,255	12.265	77	2.99	0.60	1.13	50,167.63
Impervious	C	25,919	0.595	98	0.20	0.04	2.85	6,151.32
		560,174	12.860					56,318.95

OF-039C

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	471,620	10.827	77	2.99	0.60	1.13	44,286.10
Impervious	C	130,688	3.000	98	0.20	0.04	2.85	31,015.98
		602,308	13.827					75,302.08

OF-039D

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	946,093	21.719	77	2.99	0.60	1.13	88,840.05
Impervious	C	148,393	3.407	98	0.20	0.04	2.85	35,217.91
		1,094,486	25.126					124,057.96

OF-039E

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	457,412	10.501	77	2.99	0.60	1.13	42,951.91
Impervious	C	16,602	0.381	98	0.20	0.04	2.85	3,940.13
		474,014	10.882					46,892.04

OF-040

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	204,611	4.697	77	2.99	0.60	1.13	19,213.39
Impervious	C	95,880	2.201	98	0.20	0.04	2.85	22,755.07
		300,491	6.898					41,968.46

OF-041

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	1,795,526	41.220	77	2.99	0.60	1.13	168,603.53
Impervious	C	77,930	1.789	98	0.20	0.04	2.85	18,495.02
		1,873,456	43.009					187,098.55

OF-042

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	182,943	4.200	77	2.99	0.60	1.13	17,178.72
Impervious	C	42,318	0.971	98	0.20	0.04	2.85	10,043.27
		225,261	5.171					27,221.99

OF-042A

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	666,135	15.292	77	2.99	0.60	1.13	62,551.43
Impervious	C	101,030	2.319	98	0.20	0.04	2.85	23,977.31
		767,165	17.612					86,528.74

OF-043

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	69,922	1.605	77	2.99	0.60	1.13	6,565.82
Impervious	C	18,674	0.429	98	0.20	0.04	2.85	4,431.88
		88,596	2.034					10,997.69

OF-043A

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	527,485	12.109	77	2.99	0.60	1.13	49,531.91
Impervious	C	72,563	1.666	98	0.20	0.04	2.85	17,221.28
		600,048	13.775					66,753.19

OF-045

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	587,957	13.498	77	2.99	0.60	1.13	55,210.35
Impervious	C	94,754	2.175	98	0.20	0.04	2.85	22,487.84
		682,711	15.673					77,698.19

OP-001

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	80,675	1.852	77	2.99	0.60	1.13	7,575.55
Impervious	C	14,044	0.322	98	0.20	0.04	2.85	3,333.04
		94,719	2.174					10,908.59

OP-002

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	245,664	5.640	77	2.99	0.60	1.13	23,068.35
Impervious	C	41,922	0.962	98	0.20	0.04	2.85	9,949.29
		287,586	6.602					33,017.64

OP-002A

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)
Pervious	C	7,850,207	180.216	77	2.99	0.60	1.13	737,150.33
Impervious	C	333,119	7.647	98	0.20	0.04	2.85	79,058.68
		8,183,326	187.863					816,209.01

Total Runoff Volume (CF)	**6,401,112.02**
Total Runoff Volume (Gallons)	**47,880,317.88**

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Base Pollutant Loading (No Existing BMPs)

PA DEP Land Loading:		TN (lbs/acre/year)	TP (lbs/acre/year)	TSS (lbs/acre/year)
Lancaster	Impervious	38.53	1.55	1480.43
	Pervious	22.24	0.36	190.93
	Undeveloped	10	0.33	234.6

MS4 Regulated Area Watershed Description: Conestoga River

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
Drainage Area ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
OF-001	136,696	949,903	1,086,599	3.1	21.8	24.9	120.91	484.98	605.89	4.86	7.85	12.71	4,645.7	4,163.6	8,809.3
OF-006	270,091	2,489,658	2,759,749	6.2	57.2	63.4	238.90	1,271.12	1,510.02	9.61	20.58	30.19	9,179.3	10,912.5	20,091.9
OF-006A	406,924	29,638	436,562	9.3	0.7	10.0	359.94	15.13	375.07	14.48	0.24	14.72	13,829.7	129.9	13,959.6
OF-006B	33,129	193,729	226,858	0.8	4.4	5.2	29.30	98.91	128.21	1.18	1.60	2.78	1,125.9	849.1	1,975.1
OF-008	203,198	1,829,110	2,032,308	4.7	42.0	46.7	179.73	933.87	1,113.60	7.23	15.12	22.35	6,905.9	8,017.3	14,923.1
OF-009	61,825	1,104,581	1,166,406	1.4	25.4	26.8	54.69	563.96	618.64	2.20	9.13	11.33	2,101.2	4,841.5	6,942.7
OF-015	2,999	11,485	14,484	0.1	0.3	0.3	2.65	5.86	8.52	0.11	0.09	0.20	101.9	50.3	152.3
OF-016	1,633	23,928	25,561	0.0	0.5	0.6	1.44	12.22	13.66	0.06	0.20	0.26	55.5	104.9	160.4
OF-017	21,418	68,932	90,350	0.5	1.6	2.1	18.94	35.19	54.14	0.76	0.57	1.33	727.9	302.1	1,030.1
OF-018	18,559	14,122	32,681	0.4	0.3	0.8	16.42	7.21	23.63	0.66	0.12	0.78	630.7	61.9	692.6
OF-019	3,871	646	4,517	0.1	0.0	0.1	3.42	0.33	3.75	0.14	0.01	0.14	131.6	2.8	134.4
OF-020	287,190	616,449	903,639	6.6	14.2	20.7	254.03	314.73	568.76	10.22	5.09	15.31	9,760.4	2,702.0	12,462.4
OF-021	4,496	7,050	11,546	0.1	0.2	0.3	3.98	3.60	7.58	0.16	0.06	0.22	152.8	30.9	183.7
OF-022	1,674	0	1,674	0.0	0.0	0.0	1.48	0.00	1.48	0.06	0.00	0.06	56.9	0.0	56.9
OF-023	6,781	527	7,308	0.2	0.0	0.2	6.00	0.27	6.27	0.24	0.00	0.25	230.5	2.3	232.8
OF-025	536,202	470,910	1,007,112	12.3	10.8	23.1	474.29	240.43	714.71	19.08	3.89	22.97	18,223.4	2,064.1	20,287.4
OF-026	1,074,448	3,779,507	4,853,955	24.7	86.8	111.4	950.38	1,929.67	2,880.04	38.23	31.24	69.47	36,516.2	16,566.1	53,082.3
OF-026A	512,452	725,304	1,237,756	11.8	16.7	28.4	453.28	370.31	823.59	18.23	5.99	24.23	17,416.2	3,179.1	20,595.3
OF-027	318,032	2,287,372	2,605,404	7.3	52.5	59.8	281.31	1,167.84	1,449.15	11.32	18.90	30.22	10,808.6	10,025.9	20,834.5
OF-028	1,217,738	1,720,889	2,938,627	28.0	39.5	67.5	1,077.12	878.62	1,955.74	43.33	14.22	57.55	41,386.0	7,542.9	48,929.0
OF-029	242,703	1,059,964	1,302,667	5.6	24.3	29.9	214.68	541.18	755.85	8.64	8.76	17.40	8,248.5	4,646.0	12,894.5
OF-035	240	118	358	0.0	0.0	0.0	0.21	0.06	0.27	0.01	0.00	0.01	8.2	0.5	8.7
OF-036	0	334	334	0.0	0.0	0.0	0.00	0.17	0.17	0.00	0.00	0.00	0.0	1.5	1.5
OF-037	10,353	272,768	283,121	0.2	6.3	6.5	9.16	139.26	148.42	0.37	2.25	2.62	351.9	1,195.6	1,547.4
OF-039A	10,841	49,912	60,753	0.2	1.1	1.4	9.59	25.48	35.07	0.39	0.41	0.80	368.4	218.8	587.2
OF-039B	3,152	1,044	4,196	0.1	0.0	0.1	2.79	0.53	3.32	0.11	0.01	0.12	107.1	4.6	111.7
OF-039C	100,649	363,368	464,017	2.3	8.3	10.7	89.03	185.52	274.55	3.58	3.00	6.58	3,420.7	1,592.7	5,013.4
OF-039D	113,736	919,592	1,033,328	2.6	21.1	23.7	100.60	469.51	570.11	4.05	7.60	11.65	3,865.4	4,030.7	7,896.1
OF-039E	16,602	457,412	474,014	0.4	10.5	10.9	14.68	233.54	248.22	0.59	3.78	4.37	564.2	2,004.9	2,569.1
OF-040	92,121	196,506	288,627	2.1	4.5	6.6	81.48	100.33	181.81	3.28	1.62	4.90	3,130.8	861.3	3,992.1
OF-041	8,862	1,744	10,606	0.2	0.0	0.2	7.84	0.89	8.73	0.32	0.01	0.33	301.2	7.6	308.8
OF-042	0	166	166	0.0	0.0	0.0	0.00	0.08	0.08	0.00	0.00	0.00	0.0	0.7	0.7
OF-042A	17,798	133,429	151,227	0.4	3.1	3.5	15.74	68.12	83.87	0.63	1.10	1.74	604.9	584.8	1,189.7
OF-043	0	710	710	0.0	0.0	0.0	0.00	0.36	0.36	0.00	0.01	0.01	0.0	3.1	3.1
OF-043A	52,388	478,229	530,617	1.2	11.0	12.2	46.34	244.16	290.50	1.86	3.95	5.82	1,780.5	2,096.1	3,876.6
OF-045	89,973	562,037	652,010	2.1	12.9	15.0	79.58	286.95	366.54	3.20	4.64	7.85	3,057.8	2,463.5	5,521.3
OP-001	9,925	9,085	19,010	0.2	0.2	0.4	8.78	4.64	13.42	0.35	0.08	0.43	337.3	39.8	377.1
OP-002	22,747	167,303	190,050	0.5	3.8	4.4	20.12	85.42	105.54	0.81	1.38	2.19	773.1	733.3	1,506.4
OP-002A	138,460	333,207	471,667	3.2	7.6	10.8	122.47	170.12	292.59	4.93	2.75	7.68	4,705.7	1,460.5	6,166.2
OP003	49,699	137,993	187,692	1.1	3.2	4.3	43.96	70.45	114.41	1.77	1.14	2.91	1,689.1	604.8	2,293.9
OP003A	80,208	10,732	90,940	1.8	0.2	2.1	70.95	5.48	76.43	2.85	0.09	2.94	2,725.9	47.0	2,773.0

OP004	211,557	374,724	586,281	4.9	8.6	13.5	187.13	191.32	378.45	7.53	3.10	10.62	7,190.0	1,642.5	8,832.4
OP005	922,258	839,670	1,761,928	21.2	19.3	40.4	815.76	428.70	1,244.46	32.82	6.94	39.76	31,343.9	3,680.4	35,024.3
OP006	34,733	1,083,709	1,118,442	0.8	24.9	25.7	30.72	553.30	584.02	1.24	8.96	10.19	1,180.4	4,750.1	5,930.5
OP007	56,974	126,992	183,966	1.3	2.9	4.2	50.40	64.84	115.23	2.03	1.05	3.08	1,936.3	556.6	2,492.9
OP008	2,658	19,321	21,979	0.1	0.4	0.5	2.35	9.86	12.22	0.09	0.16	0.25	90.3	84.7	175.0
OP009	3,515	12,152	15,667	0.1	0.3	0.4	3.11	6.20	9.31	0.13	0.10	0.23	119.5	53.3	172.7
OP010	5,915	10,463	16,378	0.1	0.2	0.4	5.23	5.34	10.57	0.21	0.09	0.30	201.0	45.9	246.9
OP011	39,444	74,249	113,693	0.9	1.7	2.6	34.89	37.91	72.80	1.40	0.61	2.02	1,340.5	325.4	1,666.0
OP012	5,252	43,906	49,158	0.1	1.0	1.1	4.65	22.42	27.06	0.19	0.36	0.55	178.5	192.4	370.9
OP013	355,826	55,488	411,314	8.2	1.3	9.4	314.74	28.33	343.07	12.66	0.46	13.12	12,093.1	243.2	12,336.3
OP014	65,144	423,075	488,219	1.5	9.7	11.2	57.62	216.01	273.63	2.32	3.50	5.81	2,214.0	1,854.4	4,068.4
OP017001	178,104	753,613	931,717	4.1	17.3	21.4	157.54	384.76	542.30	6.34	6.23	12.57	6,053.0	3,303.2	9,356.2
OP022001	1,886,562	3,518,461	5,405,023	43.3	80.8	124.1	1,668.72	1,796.39	3,465.10	67.13	29.08	96.21	64,116.7	15,421.9	79,538.6
OP023001	1,137,719	1,054,647	2,192,366	26.1	24.2	50.3	1,006.34	538.46	1,544.80	40.48	8.72	49.20	38,666.5	4,622.7	43,289.2
OP023002	183,213	48,825	232,038	4.2	1.1	5.3	162.06	24.93	186.98	6.52	0.40	6.92	6,226.7	214.0	6,440.7
OP025001	60,736	34,681	95,417	1.4	0.8	2.2	53.72	17.71	71.43	2.16	0.29	2.45	2,064.2	152.0	2,216.2
OP025002	9,579	9,268	18,847	0.2	0.2	0.4	8.47	4.73	13.20	0.34	0.08	0.42	325.6	40.6	366.2
OP035001	650,829	500,521	1,151,350	14.9	11.5	26.4	575.68	255.55	831.22	23.16	4.14	27.30	22,119.1	2,193.9	24,312.9
OP036001	549,388	1,190,003	1,739,391	12.6	27.3	39.9	485.95	607.57	1,093.52	19.55	9.83	29.38	18,671.5	5,216.0	23,887.5
OP037001	319,514	4,358,088	4,677,602	7.3	100.0	107.4	282.62	2,225.07	2,507.68	11.37	36.02	47.39	10,859.0	19,102.2	29,961.2
OP041001	1,126,665	4,162,874	5,289,539	25.9	95.6	121.4	996.57	2,125.40	3,121.96	40.09	34.40	74.49	38,290.8	18,246.5	56,537.3
OL001	19,985	215,073	235,058	0.5	4.9	5.4	17.68	109.81	127.48	0.71	1.78	2.49	679.2	942.7	1,621.9
Total	**14,005,383**	**40,389,196**	**54,394,579**	**321.5**	**927.2**	**1,248.7**	**12,388.14**	**20,621.11**	**33,009.25**	**498.35**	**333.80**	**832.15**	**475,986.9**	**177,031.9**	**653,018.8**

Required Reduction Percent	**3%**	**5%**	**10%**
Required Reduction (Lbs/Year)	**990.28**	**41.61**	**65,301.88**
Required Reduction (Tons/Year)	0.50	0.02	32.65

ATTACHMENT G

EXISTING BMP POLLUTANT REDUCTIONS

1. Existing BMP Summary
2. Conestoga River (Appendix E) – Combined

EXISTING BMP POLLUTANT REDUCTIONS

1. Existing BMP Summary

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Existing BMP Summary

				MS4 Regulated Area							
BMP No.	MS3	Type	Watershed	SqFt	Acres	Pervious SqFt	Impervious SqFt	% Pervious	% Impervious	Latitude	Longitude
1	OF-017	Dry Detention Basin	Cocalico Creek	918822	21.09	740685	178137	80.61	19.39	40°2'33''	-76°24'49''
4	OF-023	Dry Detention Basin	Cocalico Creek	797213	18.30	471588	325625	59.15	40.85	40°2'38''	-76°24'25''
5	OF-041	Dry Detention Basin	Cocalico Creek	1057161	24.27	747865	309296	70.74	29.26	40°3'4''	-76°26'19''
6	OF-028	Dry Detention Basin	Cocalico Creek	68309	1.57	22636	45673	33.14	66.86	40°2'44''	-76°24'20''
7	OF-035	Dry Detention Basin	Cocalico Creek	344193	7.90	195688	148505	56.85	43.15	40°2'1''	-76°24'52''
8	OP-005	Dry Detention Basin	Cocalico Creek	99527	2.28	47329	52198	47.55	52.45	40°3'24''	-76°26'39''
9	OF-020	Dry Detention Basin	Cocalico Creek	886432	20.35	599528	286904	67.63	32.37	40°3'56''	-76°27'48''
10	OF-022	Dry Detention Basin	Cocalico Creek	537603	12.34	316965	220638	58.96	41.04	40°3'55''	-76°27'54''
11	OF-028	Dry Detention Basin	Cocalico Creek	217410	4.99	99684	117726	45.85	54.15	40°2'11''	-76°27'56''
12/ 13	OF-027	Dry Detention Basin	Cocalico Creek	1174664	26.97	1076347	98317	91.63	8.37	40°2'3''	-76°25'26''
15	OP-005	Dry Detention Basin	Cocalico Creek	360349	8.27	98317	262032	27.28	72.72	40°2'58''	-76°27'49''
16	OF-026	Dry Detention Basin	Cocalico Creek	333439	7.65	333439	0	100.00	0.00	40°3'4''	-76°27'45''
17/ 25	OF-004	Dry Detention Basin	Cocalico Creek	93696	2.15	93696	0	100.00	0.00	40°3'4''	-76°27'50''
18	OP-004	Dry Detention Basin	Cocalico Creek	260250	5.97	168283	91967	64.66	35.34	40°3'50''	-76°26'46''
19	OF-027	Dry Detention Basin	Cocalico Creek	264607	6.07	151965	112642	57.43	42.57	40°4'3''	-76°26'54''
22	OF-006	Dry Detention Basin	Cocalico Creek	818578	18.79	699126	119452	85.41	14.59	40°3'15''	-76°25'36''
23	OP-036	Dry Detention Basin	Cocalico Creek	1121076	25.74	591885	529191	52.80	47.20	40°2'49''	-76°25'54''
26	OF-022	Dry Detention Basin	Cocalico Creek	933929	21.44	583360	350569	62.46	37.54	40°4'22''	-76°27'57''

EXISTING BMP POLLUTANT REDUCTIONS

1. Conestoga River (Appendix E) – Combined

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Base Pollutant Loading With Existing BMPs Summary

East Earl Township
Base Pollutant Loading With Existing BMPs Summary:

	Drainage Area (Ac)			PA DEP Land Loading		
Drainage Area ID	**Impervious**	**Pervious**	**Total**	**TN (lbs/year)**	**TP (lbs/year)**	**TSS (lbs/year)**
Conestoga River	321.52	927.21	1,248.73	33,009.25	832.15	653,018.79
BMP Reductions				323.36	17.38	14,126.65
Base Pollutant Loading With Existing BMPs				**32,685.89**	**814.77**	**638,892.14**
Required Reduction Percent				3%	5%	10%
Required Reduction (Lbs/Year)				**980.58**	**40.74**	**63,889.21**
Required Reduction (Tons/Year)				0.49	0.02	31.94

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Existing BMPs

Worksheet 4:
Drainage Area: Conestoga River
2-year Rainfall: 3.08 in

Existing BMP Calculations:

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)	Acre-Ft
BMP 001	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	918,822	21.093	71	4.08	0.82	0.81	61,779.89	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		918,822	21.093					61,779.89	1.42
Post-Development									
Pervious	C	740,685	17.004	77	2.99	0.60	1.13	69,551.82	
Impervious	C	178,137	4.089	98	0.20	0.04	2.85	42,277.01	
		918,822	21.093					111,828.84	2.57
						Net Increase:		50,048.94	1.15
BMP 004	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	797,213	18.301	71	4.08	0.82	0.81	53,603.13	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		797,213	18.301					53,603.13	1.23
Post-Development									
Pervious	C	471,588	10.826	77	2.99	0.60	1.13	44,283.07	
Impervious	C	325,625	7.475	98	0.20	0.04	2.85	77,280.14	
		797,213	18.301					121,563.21	2.79
						Net Increase:		67,960.08	1.56

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Existing BMPs

Worksheet 4:
Drainage Area: Conestoga River
2-year Rainfall: 3.08 in

Existing BMP Calculations:

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)	Acre-Ft
BMP 005	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	1,057,161	24.269	71	4.08	0.82	0.81	71,081.55	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		1,057,161	24.269					71,081.55	1.63
Post-Development									
Pervious	C	747,865	17.169	77	2.99	0.60	1.13	70,226.04	
Impervious	C	309,296	7.100	98	0.20	0.04	2.85	73,404.80	
		1,057,161	24.269					143,630.84	3.30
						Net Increase:		72,549.29	1.67
BMP 006	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	68,309	1.568	71	4.08	0.82	0.81	4,592.97	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		68,309	1.568					4,592.97	0.11
Post-Development									
Pervious	C	22,636	0.520	77	2.99	0.60	1.13	2,125.57	
Impervious	C	45,673	1.049	98	0.20	0.04	2.85	10,839.51	
		68,309	1.568					12,965.08	0.30
						Net Increase:		8,372.11	0.19

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Existing BMPs

Worksheet 4:
Drainage Area: Conestoga River
2-year Rainfall: 3.08 in

Existing BMP Calculations:

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)	Acre-Ft
BMP 007	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	344,193	7.902	71	4.08	0.82	0.81	23,142.90	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		344,193	7.902					23,142.90	0.53
Post-Development									
Pervious	C	195,688	4.492	77	2.99	0.60	1.13	18,375.50	
Impervious	C	148,505	3.409	98	0.20	0.04	2.85	35,244.49	
		344,193	7.902					53,619.99	1.23
						Net Increase:		30,477.09	0.70
BMP 008	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	99,527	2.285	71	4.08	0.82	0.81	6,692.01	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		99,527	2.285					6,692.01	0.15
Post-Development									
Pervious	C	47,329	1.087	77	2.99	0.60	1.13	4,444.29	
Impervious	C	52,198	1.198	98	0.20	0.04	2.85	12,388.08	
		99,527	2.285					16,832.37	0.39
						Net Increase:		10,140.36	0.23

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Existing BMPs

Worksheet 4:
Drainage Area: Conestoga River
2-year Rainfall: 3.08 in

Existing BMP Calculations:

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)	Acre-Ft
BMP 009	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	886,432	20.350	71	4.08	0.82	0.81	59,602.05	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		886,432	20.350					59,602.05	1.37
Post-Development									
Pervious	C	599,528	13.763	77	2.99	0.60	1.13	56,296.89	
Impervious	C	286,904	6.586	98	0.20	0.04	2.85	68,090.54	
		886,432	20.350					124,387.43	2.86
						Net Increase:		64,785.38	1.49
BMP 010	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	537,603	12.342	71	4.08	0.82	0.81	36,147.43	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		537,603	12.342					36,147.43	0.83
Post-Development									
Pervious	C	316,965	7.277	77	2.99	0.60	1.13	29,763.66	
Impervious	C	220,638	5.065	98	0.20	0.04	2.85	52,363.72	
		537,603	12.342					82,127.37	1.89
						Net Increase:		45,979.94	1.06

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Existing BMPs

Worksheet 4:
Drainage Area: Conestoga River
2-year Rainfall: 3.08 in

Existing BMP Calculations:

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)	Acre-Ft
BMP 011	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	217,410	4.991	71	4.08	0.82	0.81	14,618.25	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		217,410	4.991					14,618.25	0.34
Post-Development									
Pervious	C	99,684	2.288	77	2.99	0.60	1.13	9,360.53	
Impervious	C	117,726	2.703	98	0.20	0.04	2.85	27,939.75	
		217,410	4.991					37,300.28	0.86
						Net Increase:		22,682.04	0.52
BMP 012/013	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	1,174,664	26.967	71	4.08	0.82	0.81	78,982.24	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		1,174,664	26.967					78,982.24	1.81
Post-Development									
Pervious	C	1,076,347	24.710	77	2.99	0.60	1.13	101,071.16	
Impervious	C	98,317	2.257	98	0.20	0.04	2.85	23,333.44	
		1,174,664	26.967					124,404.60	2.86
						Net Increase:		45,422.37	1.04
BMP 015	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	360,349	8.272	71	4.08	0.82	0.81	24,229.20	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		360,349	8.272					24,229.20	0.56
Post-Development									
Pervious	C	98,317	2.257	77	2.99	0.60	1.13	9,232.17	
Impervious	C	262,032	6.015	98	0.20	0.04	2.85	62,187.70	
		360,349	8.272					71,419.87	1.64
						Net Increase:		47,190.67	1.08

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Existing BMPs

Worksheet 4:
Drainage Area: Conestoga River
2-year Rainfall: 3.08 in

Existing BMP Calculations:

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)	Acre-Ft
BMP 016	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	333,439	7.655	71	4.08	0.82	0.81	22,419.82	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		333,439	7.655					22,419.82	0.51
Post-Development									
Pervious	C	333,439	7.655	77	2.99	0.60	1.13	31,310.60	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		333,439	7.655					31,310.60	0.72
						Net Increase:		8,890.78	0.20
BMP 017/025	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	93,696	2.151	71	4.08	0.82	0.81	6,299.95	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		93,696	2.151					6,299.95	0.14
Post-Development									
Pervious	C	93,696	2.151	77	2.99	0.60	1.13	8,798.24	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		93,696	2.151					8,798.24	0.20
						Net Increase:		2,498.30	0.06
BMP 018	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	260,250	5.975	71	4.08	0.82	0.81	17,498.73	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		260,250	5.975					17,498.73	0.40
Post-Development									
Pervious	C	168,283	3.863	77	2.99	0.60	1.13	15,802.11	
Impervious	C	91,967	2.111	98	0.20	0.04	2.85	21,826.40	
		260,250	5.975					37,628.52	0.86
						Net Increase:		20,129.79	0.46

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Existing BMPs

Worksheet 4:
Drainage Area: Conestoga River
2-year Rainfall: 3.08 in

Existing BMP Calculations:

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)	Acre-Ft
BMP 019	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	264,607	6.075	71	4.08	0.82	0.81	17,791.69	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		264,607	6.075					17,791.69	0.41
Post-Development									
Pervious	C	151,965	3.489	77	2.99	0.60	1.13	14,269.82	
Impervious	C	112,642	2.586	98	0.20	0.04	2.85	26,733.17	
		264,607	6.075					41,003.00	0.94
						Net Increase:		23,211.31	0.53
BMP 022	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	818,578	18.792	71	4.08	0.82	0.81	55,039.67	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		818,578	18.792					55,039.67	1.26
Post-Development									
Pervious	C	699,126	16.050	77	2.99	0.60	1.13	65,649.35	
Impervious	C	119,452	2.742	98	0.20	0.04	2.85	28,349.38	
		818,578	18.792					93,998.73	2.16
						Net Increase:		38,959.06	0.89
BMP 023	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	1,121,076	25.736	71	4.08	0.82	0.81	75,379.08	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		1,121,076	25.736					75,379.08	1.73
Post-Development									
Pervious	C	591,885	13.588	77	2.99	0.60	1.13	55,579.20	
Impervious	C	529,191	12.149	98	0.20	0.04	2.85	125,592.19	
		1,121,076	25.736					181,171.39	4.16
						Net Increase:		105,792.31	2.43

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Existing BMPs

Worksheet 4:
Drainage Area: Conestoga River
2-year Rainfall: 3.08 in

Existing BMP Calculations:

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)	Acre-Ft
BMP 026	**Dry Detention Basin**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	933,929	21.440	71	4.08	0.82	0.81	62,795.66	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		933,929	21.440					62,795.66	1.44
Post-Development									
Pervious	C	583,360	13.392	77	2.99	0.60	1.13	54,778.68	
Impervious	C	350,569	8.048	98	0.20	0.04	2.85	83,200.07	
		933,929	21.440					137,978.75	3.17
						Net Increase:		75,183.09	1.73

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26

Expert Panel Pollutant Reduction Efficiency Calculations:
Conestoga River
x = (12 x Ep)/IA
Ep = Post - Predevelopment volume increase
IA = Impervious Area (Ac)

					Pollutant % Removal		
BMP ID	**BMP Description**	**EP**	**IA**	**x**	**TN**	**TP**	**TSS**
BMP 001	Dry Detention Basin	1.15	4.089	3.37	5%	10%	10%
BMP 004	Dry Detention Basin	1.56	7.475	2.50	5%	10%	10%
BMP 005	Dry Detention Basin	1.67	7.100	2.81	5%	10%	10%
BMP 006	Dry Detention Basin	0.19	1.049	2.20	5%	10%	10%
BMP 007	Dry Detention Basin	0.70	3.409	2.46	5%	10%	10%
BMP 008	Dry Detention Basin	0.23	1.198	2.33	5%	10%	10%
BMP 009	Dry Detention Basin	1.49	6.586	2.71	5%	10%	10%
BMP 010	Dry Detention Basin	1.06	5.065	2.50	5%	10%	10%
BMP 011	Dry Detention Basin	0.52	2.703	2.31	5%	10%	10%
BMP 012/013	Dry Detention Basin	1.04	2.257	5.54	5%	10%	10%
BMP 015	Dry Detention Basin	1.08	6.015	2.16	5%	10%	10%
BMP 016	Dry Detention Basin	0.20	0.000	0.00	5%	10%	10%
BMP 017/025	Dry Detention Basin	0.06	0.000	0.00	5%	10%	10%
BMP 018	Dry Detention Basin	0.46	2.111	2.63	5%	10%	10%
BMP 019	Dry Detention Basin	0.53	2.586	2.47	5%	10%	10%
BMP 022	Dry Detention Basin	0.89	2.742	3.91	5%	10%	10%
BMP 023	Dry Detention Basin	2.43	12.149	2.40	5%	10%	10%
BMP 026	Dry Detention Basin	1.73	8.048	2.57	5%	10%	10%

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Existing BMP Pollutant Reduction

PA DEP Land Loading:		TN (lbs/acre/year)	TP (lbs/acre/year)	TSS (lbs/acre/year)
Lancaster	Impervious	38.53	1.55	1480.43
	Pervious	22.24	0.36	190.93
	Undeveloped	10	0.33	234.6

Conestoga River

OF-017

BMP 001 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 001	178,137	740,685	918,822	4.1	17.0	21.1	157.57	378.16	**535.73**	6.34	6.12	**12.46**	6,054.2	3,246.5	**9,300.7**

BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m 5% 10% 10%

Pollutant Reduction **26.79** **1.25** **930.07**

OF-023

BMP 004 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 004	325,625	471,588	797,213	7.5	10.8	18.3	288.02	240.77	**528.80**	11.59	3.90	**15.48**	11,066.7	2,067.0	**13,133.7**

BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m 5% 10% 10%

Pollutant Reduction **26.44** **1.55** **1,313.37**

OF-041

BMP 005 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 005	309,296	747,865	1,057,161	7.1	17.2	24.3	273.58	381.83	**655.41**	11.01	6.18	**17.19**	10,511.7	3,278.0	**13,789.7**

BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m 5% 10% 10%

Pollutant Reduction **32.77** **1.72** **1,378.97**

OF-028

BMP 006 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 006	45,673	22,636	68,309	1.0	0.5	1.6	40.40	11.56	**51.96**	1.63	0.19	**1.81**	1,552.2	99.2	**1,651.5**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**2.60**			**0.18**			**165.15**

OF-035

BMP 007 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 007	148,505	195,688	344,193	3.4	4.5	7.9	131.36	99.91	**231.27**	5.28	1.62	**6.90**	5,047.1	857.7	**5,904.8**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**11.56**			**0.69**			**590.48**

OP-005

BMP 008 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 008	52,198	47,329	99,527	1.2	1.1	2.3	46.17	24.16	**70.33**	1.86	0.39	**2.25**	1,774.0	207.5	**1,981.5**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**3.52**			**0.22**			**198.15**

OF-020

BMP 009 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 009	286,904	599,528	886,432	6.6	13.8	20.3	253.77	306.10	**559.87**	10.21	4.95	**15.16**	9,750.7	2,627.8	**12,378.5**
Expert Panel Performance Standards									5%			10%			10%
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									**27.99**			**1.52**			**1,237.85**

OF-022

BMP 010 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 010	220,638	316,965	537,603	5.1	7.3	12.3	195.16	161.83	**356.99**	7.85	2.62	**10.47**	7,498.6	1,389.3	**8,887.9**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**17.85**			**1.05**			**888.79**

OF-028

BMP 011 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 011	117,726	99,684	217,410	2.7	2.3	5.0	104.13	50.89	**155.03**	4.19	0.82	**5.01**	4,001.0	436.9	**4,438.0**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**7.75**			**0.50**			**443.80**

OF-027

BMP 012/013 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 012/013	98,317	1,076,347	1,174,664	2.3	24.7	27.0	86.96	549.54	**636.50**	3.50	8.90	**12.39**	3,341.4	4,717.8	**8,059.2**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**31.83**			**1.24**			**805.92**

OP-005

BMP 015 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 015	262,032	98,317	360,349	6.0	2.3	8.3	231.77	50.20	**281.97**	9.32	0.81	**10.14**	8,905.4	430.9	**9,336.4**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**14.10**			**1.01**			**933.64**

OF-026

BMP 016 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 016	0	333,439	333,439	0.0	7.7	7.7	0.00	170.24	**170.24**	0.00	2.76	**2.76**	0.0	1,461.5	**1,461.5**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**8.51**			**0.28**			**146.15**

OF-004

BMP 017/025 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 017/025	0	93,696	93,696	0.0	2.2	2.2	0.00	47.84	**47.84**	0.00	0.77	**0.77**	0.0	410.7	**410.7**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**2.39**			**0.08**			**41.07**

OP-004

BMP 018 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 018	91,967	168,283	260,250	2.1	3.9	6.0	81.35	85.92	**167.27**	3.27	1.39	**4.66**	3,125.6	737.6	**3,863.2**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**8.36**			**0.47**			**386.32**

OF-027

BMP 019 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 019	112,642	151,965	264,607	2.6	3.5	6.1	99.63	77.59	**177.22**	4.01	1.26	**5.26**	3,828.3	666.1	**4,494.3**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**8.86**			**0.53**			**449.43**

OF-006

BMP 022 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 022	119,452	699,126	818,578	2.7	16.0	18.8	105.66	356.95	**462.60**	4.25	5.78	**10.03**	4,059.7	3,064.4	**7,124.1**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**23.13**			**1.00**			**712.41**

OP-036

BMP 023 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 023	529,191	591,885	1,121,076	12.1	13.6	25.7	468.08	302.19	**770.28**	18.83	4.89	**23.72**	17,985.1	2,594.3	**20,579.4**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**38.51**			**2.37**			**2,057.94**

OF-022

BMP 026 Dry Detention Basin

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 026	350,569	583,360	933,929	8.0	13.4	21.4	310.09	297.84	**607.93**	12.47	4.82	**17.30**	11,914.4	2,557.0	**14,471.4**
BMP Efectiveness Values Table DEP Document #3800-PM-BCW0100m									5%			10%			10%
Pollutant Reduction									**30.40**			**1.73**			**1,447.14**

ATTACHMENT H

EXISTING LOADING WITH BMPs FOR POLLUTANTS OF CONCERN

1. Conestoga River (Appendix E)

EXISTING LOADING WITH BMPs
FOR POLLUTANTS OF CONCERN

1. Conestoga River (Appendix E)

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Base Pollutant Loading With Existing BMPs Summary

East Earl Township
Base Pollutant Loading With Existing BMPs Summary:

	Drainage Area (Ac)			PA DEP Land Loading		
Drainage Area ID	**Impervious**	**Pervious**	**Total**	**TN (lbs/year)**	**TP (lbs/year)**	**TSS (lbs/year)**
Conestoga River	321.52	927.21	1,248.73	33,009.25	832.15	653,018.79
BMP Reductions				323.36	17.38	14,126.65
Base Pollutant Loading With Existing BMPs				**32,685.89**	**814.77**	**638,892.14**
Required Reduction Percent				3%	5%	10%
Required Reduction (Lbs/Year)				**980.58**	**40.74**	**63,889.21**
Required Reduction (Tons/Year)				0.49	0.02	31.94

ATTACHMENT I

POTENTIAL BMP POLLUTANT LOADING REDUCTION

1. Potential BMP Description

2. Conestoga River (Appendix E)

POTENTIAL BMP POLLUTANT LOADING REDUCTION

Potential BMP Description

Conestoga River (Appendix E)

BMP OP041-001: Bioswale
The analysis evaluated the modification of an existing swale into a bioswale, increasing the swales width and reducing flow depth and velocity. The BMP would parallel Witmer Road, located on private property within a drainage easement. Construction activities include: Re-grading/expanding channel; installing ballast and amended soils; bioswale plantings; and stabilization of existing storm outlets.

BMP OP022-001: Bioswale
The analysis evaluated the modification of an existing swale into a bioswale, increasing the swales width and reducing flow depth and velocity. The BMP would start from near Division Highway, East of Springville Road, and terminate near Cedar Creek. The BMP would be located on private property within a drainage easement. Construction activities include: Re-grading/expanding channel; installing ballast and amended soils; bioswale plantings; and stabilization of existing storm outlets.

BMP 002-BR1: Wet Pond - Basin Retrofit
The analysis evaluated the conversion of the existing dry detention basin, located South of 128 Toddy Drive and between Toddy Drive and Springfield Road to a wet pond. The pond is located on private property owned by Shady Maple; public/private partnership may exist for this BMP. Construction activities include: excavation to provide wet storage area; installation of new outlet structure; installation of amended soils to promote infiltration; and installation of wet plantings to promote nutrient removal.

POTENTIAL BMP POLLUTANT LOADING REDUCTION

2. Conestoga River (Appendix E)

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Proposed BMP Pollutant Reduction

			Pollutant Reduction		
Drainage Area ID	**Prop. BMP ID**	**BMP Description**	**TN (lbs/year)**	**TP (lbs/year)**	**TSS (lbs/year)**
BMP OP041-001	BMP OP041-001	Bioswale	1,732.39	47.14	34,676.99
BMP OP022-001	BMP OP022-001	Bioswale	2,425.57	72.16	55,677.04
BMP 002-BR1	BMP 002-BR1	Wet-Pond Basin Retrofit	231.72	19.68	21,644.59
			4,389.68	**138.98**	**111,998.63**

REQUIRED POLLUTANT REDUCTION (Lbs/Year)	**980.58**	**40.74**	**63,889.21**
Maximum Permitted Reduction for Storm Sewer System Solids Removal (50%)	490.29	20.37	31,944.61

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Proposed BMPs

Worksheet 4:
Drainage Area: Urbanized MS4 Regulated Area
2-year Rainfall: 3.08 in

Proposed BMP Calculations:

Cover/Type/Condition	Soil Type	Area (SF)	Area (Ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (CF)	Acre-Ft
BMP OP041-001	**Bioswale**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	4,062,117	93.253	71	4.08	0.82	0.81	273,129.24	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		4,062,117	93.253					273,129.24	6.27
Post-Development									
Pervious	C	2,990,136	68.644	77	2.99	0.60	1.13	280,779.82	
Impervious	C	1,071,981	24.609	98	0.20	0.04	2.85	254,411.81	
		4,062,117	93.253					535,191.63	12.29
						Net Increase:		262,062.39	6.02
BMP OP022-001	**Bioswale**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	5,405,023	124.082	71	4.08	0.82	0.81	363,423.76	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		5,405,023	124.082					363,423.76	8.34
Post-Development									
Pervious	C	3,518,461	80.773	77	2.99	0.60	1.13	330,390.61	
Impervious	C	1,886,562	43.310	98	0.20	0.04	2.85	447,735.22	
		5,405,023	124.082					778,125.83	17.86
						Net Increase:		414,702.07	9.52
BMP 002-BR1	**Wet-Pond Basin Retrofit**								
Pre-Development									
Pervious	C	0	0.000	77	2.99	0.60	1.13	0.00	
Meadow	C	2,192,366	50.330	71	4.08	0.82	0.81	147,410.64	
Impervious	C	0	0.000	98	0.20	0.04	2.85	0.00	
		2,192,366	50.330					147,410.64	3.38
Post-Development									
Pervious	C	1,054,647	24.211	77	2.99	0.60	1.13	99,033.49	
Impervious	C	1,137,719	26.118	98	0.20	0.04	2.85	270,013.32	
		2,192,366	50.330					369,046.81	8.47
						Net Increase:		221,636.17	5.09

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26

Expert Panel Pollutant Reduction Efficiency Calculations:

x = (12 x Ep)/IA
Ep = Post - Predevelopment volume increase
IA = Impervious Area (Ac)

					Expert Panel Report Pollutant % Removal - ST			PA DEP BMP Effectiveness Values Pollutant % Removal			Existing BMP Efficiency Pollutant % Removal			Adjusted BMP Effectiveness Values Pollutant % Removal		
BMP ID	**BMP Description**	**EP**	**IA**	**x**	**TN**	**TP**	**TSS**	**TN**	**TP**	**TSS**	**TN**	**TP**	**TSS**	**TN**	**TP**	**TSS**
BMP OP041-001	Bioswale	6.02	24.609	2.93				70%	75%	70%				70%	75%	70%
BMP OP022-001	Bioswale	9.52	43.310	2.64	40%	60%	77%	70%	75%	70%	5%	10%	10%	105%	125%	137%
BMP 002-BR1	Wet-Pond Basin Retrofit	5.09	26.118	2.34				15%	40%	50%				15%	40%	50%

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Proposed BMP Pollutant Reduction

PA DEP Land Loading:		TN (lbs/acre/year)	TP (lbs/acre/year)	TSS (lbs/acre/year)
Lancaster	Impervious	38.53	1.55	1480.43
	Pervious	22.24	0.36	190.93
	Undeveloped	10	0.33	234.6

BMP OP041-001
Bioswale

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP OP041-001	1,071,981	2,990,136	4,062,117	24.6	68.6	93.3	948.20	1,526.64	**2,474.84**	38.14	24.71	**62.86**	36,432.3	13,106.2	**49,538.6**
BMP Effectiveness Value (3800-PM-BCW0100m)									70%			75%			70%
Pollutant Reduction									**1,732.39**			**47.14**			**34,676.99**

BMP OP022-001
Bioswale

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP OP022-001	1,886,562	3,518,461	5,405,023	43.3	80.8	124.1	1,668.72	1,796.39	**3,465.10**	67.13	29.08	**96.21**	64,116.7	15,421.9	**79,538.6**
BMP Effectiveness Value (3800-PM-BCW0100m)									70%			75%			70%
Pollutant Reduction									**2,425.57**			**72.16**			**55,677.04**

BMP 002-BR1
Wet-Pond Basin Retrofit

	Drainage Area (SF)			Drainage Area (Ac)			PA DEP Land Loading								
BMP ID	**Impervious**	**Pervious**	**Total**	**Impervious**	**Pervious**	**Total**	**TN - Impervious Area (lbs/year)**	**TN - Pervious Area (lbs/year)**	**TN (lbs/year)**	**TP - Impervious Area (lbs/year)**	**TP - Pervious Area (lbs/year)**	**TP (lbs/year)**	**TSS - Impervious Area (lbs/year)**	**TSS - Pervious Area (lbs/year)**	**TSS (lbs/year)**
BMP 002-BR1	1,137,719	1,054,647	2,192,366	26.1	24.2	50.3	1,006.34	538.46	**1,544.80**	40.48	8.72	**49.20**	38,666.5	4,622.7	**43,289.2**
BMP Effectiveness Value (3800-PM-BCW0100m)									15%			40%			50%
Pollutant Reduction									**231.72**			**19.68**			**21,644.59**

ATTACHMENT J

SELECTED BMP POLLUTANT LOADING REDUCTION

1. BMP Description
2. BMP Pollutant Loading Reduction

SELECTED BMP POLLUTANT LOADING REDUCTION

BMP Description

Conestoga River (Appendix E) – Combined

BMP OP041-001: Bioswale
The analysis evaluated the modification of an existing swale into a bioswale, increasing the swales width and reducing flow depth and velocity. The BMP would parallel Witmer Road, located on private property within a drainage easement. Construction activities include: Re-grading/expanding channel; installing ballast and amended soils; bioswale plantings; and stabilization of existing storm outlets.

BMP OP022-001: Bioswale
The analysis evaluated the modification of an existing swale into a bioswale, increasing the swales width and reducing flow depth and velocity. The BMP would start from near Division Highway, East of Springville Road, and terminate near Cedar Creek. The BMP would be located on private property within a drainage easement. Construction activities include: Re-grading/expanding channel; installing ballast and amended soils; bioswale plantings; and stabilization of existing storm outlets.

SELECTED BMP POLLUTANT LOADING REDUCTION

1. BMP Pollutant Loading Reduction

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26

Selected BMP Summary

Drainage Area ID	Prop. BMP ID	BMP Description	Pollutant Reduction			Estimate Project Total
			TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)	
BMP OP041-001	BMP OP041-001	Bioswale	1,732.39	47.14	34,676.99	$103,080.96
BMP OP022-001	BMP OP022-001	Bioswale	2,425.57	72.16	55,677.04	$194,150.40
			4,157.96	**119.30**	**90,354.03**	**$297,231.36**

REQUIRED POLLUTANT REDUCTION (Lbs/Year)	**980.58**	**40.74**	**63,889.21**
Maximum Permitted Reduction for Storm Sewer System Solids Removal (50%)	490.29	20.37	31,944.61

Adjustment for Storm Sewer Solids:

Drainage Area ID	Prop. BMP ID	BMP Description	Pollutant Reduction		
			TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
BMP OP041-001	BMP OP041-001	Bioswale	490.29	20.37	31,944.61
BMP OP022-001	BMP OP022-001	Bioswale	2425.570812	72.15594112	55677.04128
			2,915.86	**92.53**	**87,621.65**

ATTACHMENT K

PLANNING ESTIMATES OF OPINION OF PROBABLE COST

The ARRO Group, Inc.
4750 Delbrook Road, Suite 101
Mechanicsburg, PA 17050-3017

OPINION OF PROBABLE CONSTRUCTION COST

Date: July 24, 2017 NJM
Project Number: 10714.26 Checked By:
Project Name: East Earl Township PRP

BMP OP041-001: Bioswale

Item No.	Description	Qty.	Unit	Unit Price	Total Cost
	Miscellaneous/Site Work Payment Items				
1	Mobilization	1	LS	$8,500.00	$8,500.00
2	Excavation	400	CY	$30.00	$12,000.00
3	Finish Grading and Seeding - Bioswale	2,400	SY	$10.00	$24,000.00
4	12" Gravel	450	Ton	$25.00	$11,250.00
5	6" Amended soils	170	Ton	$58.00	$9,860.00
6	Plantings	50	Ea	$30.00	$1,500.00
	Subtotal				$67,110.00
	Contingency (20%)				$13,422.00
	Construction Sub-Total				$80,532.00
	Engineering (20%)				$16,106.40
	Right-of-Way (5%)				$4,026.60
	Legal (3%)				$2,415.96
					.
	TOTAL				**$103,080.96**

The ARRO Group, Inc.
4750 Delbrook Road, Suite 101
Mechanicsburg, PA 17050-3017

OPINION OF PROBABLE CONSTRUCTION COST

Date: July 24, 2018
Project Number: 10714.26
Project Name: East Earl Township PRP
Checked By: NJM

BMP OP022-001: Bioswale

Item No.	Description	Qty.	Unit	Unit Price	Total Cost
	Miscellaneous/Site Work Payment Items				
1	Mobilization	1	LS	$15,000.00	$15,000.00
2	Excavation	800	CY	$30.00	$24,000.00
3	Finish Grading and Seeding - Bioswale	4,000	SY	$10.00	$40,000.00
4	12" Gravel	600	Ton	$25.00	$15,000.00
5	6" Amended soils	300	Ton	$58.00	$17,400.00
6	Plantings	500	Ea	$30.00	$15,000.00
	Subtotal				$126,400.00
	Contingency (20%)				$25,280.00
	Construction Sub-Total				$151,680.00
	Engineering (20%)				$30,336.00
	Right-of-Way (5%)				$7,584.00
	Legal (3%)				$4,550.40
					.
	TOTAL				**$194,150.40**

The ARRO Group, Inc.
4750 Delbrook Road, Suite 101
Mechanicsburg, PA 17050-3017

OPINION OF PROBABLE CONSTRUCTION COST

Date: July 24, 2018 — NJM
Project Number: 10714.26 — Checked By:
Project Name: East Earl Township PRP

BMP 002-BR1: Wet Pond - Basin Retrofit

Item No.	Description	Qty.	Unit	Unit Price	Total Cost
	Miscellaneous/Site Work Payment Items				
1	Mobilization	1	LS	$15,000.00	$15,000.00
2	M&P	1	LS	$1,500.00	$1,500.00
3	Erosion and Sedimentation Control	1	LS	$2,500.00	$2,500.00
4	Finish Grading and Seeding	3,000	SY	$6.00	$18,000.00
5	Excavation	2,120	CY	$30.00	$63,600.00
6	Rip Rap	50	Ton	$90.00	$4,500.00
7	Outlet Structure Modification	1	LS	$4,000.00	$4,000.00
8	Soil Amendment	2,119	CY	$25.00	$52,975.00
9	Wet Plantings	500	Ea	$18.00	$9,000.00
	Subtotal				$171,075.00
	Contingency (20%)				$34,215.00
	Construction Sub-Total				$205,290.00
	Engineering (20%)				$41,058.00
	Right-of-Way (5%)				$10,264.50
	Legal (3%)				$6,158.70
					.
	TOTAL				**$262,771.20**

ATTACHMENT L

RETURN ON INVESTMENT ANALYSIS

East Earl Township
Pollutant Reduction Plan (PRP)
ARRO No.: 00010714.26
Proposed BMP Return-on-Investment Calculation

			Pollutant Reduction						
Drainage Area ID	**Prop. BMP ID**	**BMP Description**	**TN (lbs/year)**	**TP (lbs/year)**	**TSS (lbs/year)**	**Estimate Project Total**	**$ per lbs of TN Removed**	**$ per lbs of TP Removed**	**$ per lbs of TSS Removed**
BMP OP041-001	BMP OP041-001	Bioswale	1,732.39	47.14	34,676.99	$103,080.96	$ 59.50	$ 2,186.60	$ 2.97
BMP OP022-001	BMP OP022-001	Bioswale	2,425.57	72.16	55,677.04	$194,150.40	$ 80.04	$ 2,690.71	$ 3.49
BMP 002-BR1	BMP 002-BR1	Wet-Pond Basin Retrofit	231.72	19.68	21,644.59	$194,150.40	$ 837.86	$ 9,865.43	$ 8.97
			4,389.68	138.98	111,998.63				