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227 South Sproul Road
Broomall, PA 19008-2397
www.marpletwp.com
September 13, 2017

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MRPL 0401

Pravin Patel, PE
Department of Environmental Protection
Southeast Regional Office
Bureau of Clean Water- Permits Section
2 East Main Street
Norristown, PA 19401

**Re: Marple Township, Delaware County
NPDES Individual Permit (PAG-13) for Stormwater Discharges from MS4's
Permit Renewal Package- PAI130021**

Dear Mr. Patel:

On behalf of Marple Township, Delaware County, attached are the following items in connection with the MS4 Permit renewal:

- Three (3) copies of the Notice of Intent (NOI) for Coverage Under the Individual NPDES Permit
- Three (3) copies of the NOI Checklist
- Three (3) copies of the Pollution Reduction Plan
- Three (3) copies of the Township's Stormwater Management Ordinance
- Three (3) copies of the storm sewer map
- Permit filing fee in the amount of \$2,500

Should you have any questions or comments, please feel free to contact the undersigned.

Sincerely,

Joseph A. Mastronardo, PE
Senior Engineer
PENNONI ASSOCIATES INC.
Township Engineers

cc: Anthony Hamaday, Township Manager, w/enclosure



NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) INDIVIDUAL PERMIT TO DISCHARGE STORMWATER FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) CHECKLIST

APPLICANT'S ✓ CHECKLIST

Applicant Name Marple Township

Check the following list to make sure you have included all the required information. Place a checkmark in the box provided for all items completed and/or provided. Failure to provide all of the requested information will delay the processing of the application.

ENCLOSE THIS CHECKLIST WITH YOUR COMPLETED APPLICATION.

	REQUIREMENTS FOR ALL DISCHARGES	Check ✓ If Included	DEP Use Only
1.	One original and two copies of the completed application (3800-PM-BCW0200b).	☒	
2.	Application fee (\$2,500 for renewal, \$5,000 for new).	☒	
3.	One original and two copies of the completed Waiver Application (3800-PM-BCW0100e), if applicable.	☐	
4.	Stormwater map(s) (existing permittees) or topographic map(s) (MS4s with previous waivers and new applicants).	☒	
5.	Memorandum of Understanding (MOU) or other written agreement with parties that will implement one or more BMPs, if applicable.	☐	
6.	Chesapeake Bay Pollutant Reduction Plan (PRP), if applicable. (In addition, submit an electronic version or hard copy to DEP's Bureau of Clean Water).	☐	
7.	PRP for Impaired Waters, if applicable. (In addition, submit an electronic version or hard copy to DEP's Bureau of Clean Water).	☒	
8.	TMDL Plan, if applicable. (In addition, submit an electronic version or hard copy to DEP's Bureau of Clean Water).	☐	
9.	Stormwater Management Ordinance (municipal applicants seeking renewed coverage only).	☒	
10.	Stormwater Management Ordinance Checklist (3800-PM-BCW0100g), if applicable.	☐	
11.	Standard Operating Procedure(s) (non-municipal applicants seeking renewed coverage only).	☐	
12.	Complete application packages for each co-applicant (joint applications only).	☐	

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) INDIVIDUAL PERMIT TO DISCHARGE STORMWATER FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) APPLICATION

Before completing this form, read the step-by-step instructions provided in this application package.

Related ID#s (If Known) Client ID# _____ APS ID# _____ Site ID# _____ Auth ID# _____ Facility ID# _____	DEP USE ONLY Date Received _____ PA _____ PDG? _____
--	--

GENERAL INFORMATION

Type of Permit: ☐ New Permit ☒ Renewal of Permit Permit No.: PA1130021

Is a waiver of coverage being requested and is a waiver application attached to this application? ☐ Yes ☒ No

Is individual permit coverage requested for more than one MS4 applicant? ☐ Yes ☒ No

If Yes, submit this application for each co-applicant and complete the information below (see instructions):

Joint Client Name: _____ Joint Client Phone: _____

Joint Client Address: _____ Joint Client Contact: _____

Joint Client City, State, Zip: _____

MS4 CLIENT/OPERATOR INFORMATION

DEP Client ID#	Client Type/Code		
Organization Name or Registered Fictitious Name Marple Township		Employer ID# (EIN) 23-6000416	Dun & Bradstreet ID#
Mailing Address Line 1 227 South Sproul Road		Mailing Address Line 2	
Address Last Line – City Broomall	State PA	ZIP+4 19008	Country USA
Client Contact Last Name Hamaday	First Name Anthony	MI	Suffix
Client Contact Title Township Manager	Phone 610-356-4040	Ext	
Email Address ahamaday@marpletwp.com	FAX		

MS4 SITE INFORMATION

DEP Site ID#	Site Name			
Urbanized Area (UA) Name(s) Philadelphia NW		UA Area (specify acres or mi ²)		
County Name Delaware	Municipality Name Marple Township	City ☐	Boro ☐	Twp ☒
County Name	Municipality Name	City ☐	Boro ☐	Twp ☐
Site Location Address Line 1 227 South Sproul Road		Site Location Address Line 2		

Site Location City Broomall	State PA	ZIP+4 19008
Detailed Written Directions to Site		
Site Contact Last Name Hamaday	First Name Anthony	MI Suffix
Site Contact Title Township Manager	Site Contact Firm	
Mailing Address Line 1 227 South Sproul Road	Mailing Address Line 2	
Address Last Line – City Broomall	State PA	ZIP+4 19008
Phone 610-356-4040	Ext FAX	Email Address ahamaday@marpletwp.com
SIC Code(s) (List All That Apply)		NAICS Code(s)

Site-to-Client Relationship
Owner

STORMWATER DISCHARGE INFORMATION

Map(s). Attach a map(s) to the application that identifies all stormwater discharge points (outfalls) from the MS4 to surface waters. For MS4s with existing permit coverage (that did not receive a waiver from DEP during the latest permit term), the map must include all elements required by MCM #3 in the NPDES permit. See instructions.

Surface Water Information. For each surface water body that receives stormwater discharges from the MS4, list the surface water, the furthest downstream outfall ID number, and the surface water's existing use, impairment and TMDL/WLA information in the table below. See instructions. **NOTE** – If the MS4 discharges to any surface water whose existing use is HQ or EV, the MS4 must apply for an individual permit.

Surface Water Name	Outfall No.	Ch. 93 Existing Use	Impaired?	Approved TMDL?	WLA?
Darby Creek	DC-1	WWF	Y	N	N
Langford Run	LR-2	WWF	Y	N	N
Whetstone Run	WR-1	WWF	Y	N	N
Crum Creek	CC-1	WWF	Y	N	N
Trout Run	TR-1	WWF	Y	N	N
Hotland Run	HR-3	EV	Y	N	N
Martin's Run	MR-2	WWF	Y	N	N

Outfall Locations. For each outfall identified in the table above, list the latitude and longitude coordinates. Identify the Horizontal Reference Datum used to determine the coordinates.

Outfall No.	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
DC-1	39	57	30.25	75	20	4.81
LR-2	39	58	29.04	75	20	32.42
WR-1	39	57	16.71	75	20	20.17
CC-1	39	55	58.7	75	21	47.7
TR-1	39	56	34.16	75	22	25.61
HR-3	39	56	24.47	75	21	51.63
MR-2	39	57	16.85	75	23	29.66

Horizontal Reference Datum:
☐ NAD of 1927
☐ NAD of 1983
☒ WGS of 1984
☐ Unknown

TMDL Details. For any surface water with an approved TMDL in which a WLA is applicable to the MS4, provide the WLAs below.

[illegible]

MS4 Requirements. Are requirement(s) specified in DEP's MS4 Requirements Table for the MS4? ☐ Yes ☐ No

If Yes, summarize the requirements below by checking all boxes that apply:

- | | | |
|-------------------------------------|---|--|
| ☐ | Appendix A (AMD Metals and pH) | |
| ☐ | Appendix B (Pathogens) | |
| ☒ | Appendix C (Priority Organic Compounds) | |
| ☐ | Appendix D (Chesapeake Bay Nutrients/Sediment) | ☐ Pollutant Reduction Plan attached to application |
| ☒ | Appendix E (Impaired Waters Nutrients/Sediment) | ☒ Pollutant Reduction Plan attached to application |
| ☐ | TMDL Plan | ☐ TMDL Plan attached to application |

NOTE – Appendices D and E and the TMDL Plan require the applicant to submit documentation of a public involvement and participation process.

STORMWATER MANAGEMENT PROGRAM

- ☒ Check here if the applicant is relying and will continue to rely on Pennsylvania's Chapter 102 program for erosion and sediment control (E&S) and post-construction stormwater management requirements. (If checked, there is no need to complete the information in the table below for MCM #4, BMPs #4 – #8, and MCM #5, BMPs #4 – #6).

Minimum Control Measure (MCM)	BMP #	BMP Summary	Responsible Party	Contact Name	Contact Phone No.	MOU or Agreement?
#1 – Public Education and Outreach	1	Develop, implement and maintain a written Public Education and Outreach Program.	Marple Township	Anthony Hamaday	610-356-4040	☐
	2	Develop and maintain lists of target audience groups that are present within the areas served by the permittee's regulated small MS4.	Marple Township	Anthony Hamaday	610-356-4040	☐
	3	The permittee shall annually publish at least one issue of a newsletter, a pamphlet, a flyer, or a website that includes general stormwater educational information, a general description of the permittee's SWMP, and/or information about the permittee's stormwater management activities.	Marple Township	Anthony Hamaday	610-356-4040	☐
	4	Distribute stormwater educational materials and/or information to the target audiences using two methods annually.	Marple Township	Anthony Hamaday	610-356-4040	☐
#2 – Public Participation and Involvement	1	Develop, implement and maintain a written Public Involvement and Participation Program (PIPP).	Marple Township	Anthony Hamaday	610-356-4040	☐
	2	Provide adequate public notice and opportunities for public review, input, and feedback prior to adoption of any ordinance, SOP or plan required by the General Permit.	Marple Township	Anthony Hamaday	610-356-4040	☐
	3	Regularly solicit public involvement and participation from the target audience groups using available distribution and outreach methods.	Marple Township	Anthony Hamaday	610-356-4040	☐
#3 – Illicit Discharge Detection and Elimination	1	Develop and implement a written program for the detection, elimination, and prevention of illicit discharges into the regulated MS4.	Marple Township	Anthony Hamaday	610-356-4040	☐
	2	Develop and maintain a map of the regulated small MS4's outfalls and surface waters.	Marple Township	Anthony Hamaday	610-356-4040	☐
	3	In conjunction with the map(s) created under BMP #2 (either on the same map or on a different map), new permittees shall show, and existing permittees shall update, the entire storm sewer collection system, including roads, inlets, piping, swales, catch basins, channels, basins, and any other features of the permittee's storm sewer system including municipal boundaries and/or watershed boundaries.	Marple Township	Anthony Hamaday	610-356-4040	☐

Minimum Control Measure (MCM)	BMP #	BMP Summary	Responsible Party	Contact Name	Contact Phone No.	MOU or Agreement?
#3 – Illicit Discharge Detection and Elimination (continued)	4	The permittee shall conduct outfall field screening, identify the source of any illicit discharges, and remove or correct any illicit discharges.	Marple Township	Anthony Hamaday	610-356-4040	☐
	5	Enact a Stormwater Management Ordinance (municipal permittees) or SOP (non-municipal permittees) to implement and enforce a stormwater management program that includes prohibition of non-stormwater discharges to the regulated small MS4.	Marple Township	Anthony Hamaday	610-356-4040	☐
	6	Provide educational outreach to public employees, business owners and employees, property owners, the general public and elected officials (i.e., target audiences) about the program to detect and eliminate illicit discharges.	Marple Township	Anthony Hamaday	610-356-4040	☐
#4 – Construction Site Stormwater Runoff Control	1	If an NPDES permit is required for earth disturbance activities, do not issue a building permit or approval until confirmation that a valid NPDES permit is obtained.	Marple Township	Anthony Hamaday	610-356-4040	☐
	2	Notify DEP or CCD within 5 days of the receipt of an application for a permit involving an earth disturbance activity consisting of one acre or more.	Marple Township	Anthony Hamaday	610-356-4040	☐
	3	Enact, implement, and enforce an ordinance to require the implementation of erosion and sediment control BMPs, as well as sanctions to ensure compliance.	Marple Township	Anthony Hamaday	610-356-4040	☐
	4	Review Erosion and Sediment (E&S) control plans to ensure that such plans adequately consider water quality impacts and meet regulatory requirements.	Marple Township	Anthony Hamaday	610-356-4040	☐
	5	Conduct inspections regarding installation and maintenance of E&S control measures during earth disturbance activities. Maintain records of site inspections, including dates and inspection results, in accordance with the record retention requirements in this General Permit.	Marple Township	Anthony Hamaday	610-356-4040	☐
	6	Conduct enforcement when installation and maintenance of E&S control measures during earth disturbance activities does not comply with permit and/or regulatory requirements.	Marple Township	Anthony Hamaday	610-356-4040	☐
	7	Develop and implement requirements for construction site operators to control waste at construction sites that may cause adverse impacts to water quality. The permittee shall provide education on these requirements to construction site operators.	Marple Township	Anthony Hamaday	610-356-4040	☐

Minimum Control Measure (MCM)	BMP #	BMP Summary	Responsible Party	Contact Name	Contact Phone No.	MOU or Agreement?
#4 – Construction Site Stormwater Runoff Control (continued)	8	Develop and implement procedures for the receipt and consideration of public inquiries, concerns, and information submitted by the public to the permittee regarding local construction activities. The permittee shall demonstrate acknowledgement and consideration of the information submitted, whether submitted verbally or in writing.	Marple Township	Anthony Hamaday	610-356-4040	☐
	1	Enact, implement, and enforce an ordinance or other regulatory mechanism to address post-construction stormwater runoff from new development and redevelopment projects, as well as sanctions and penalties associated with non-compliance.	Marple Township	Anthony Hamaday	610-356-4040	☐
	2	Develop and implement measures to encourage and expand the use of Low Impact Development (LID) in new development and redevelopment.	Marple Township	Anthony Hamaday	610-356-4040	☐
	3	Ensure adequate operation and maintenance of all post-construction stormwater management BMPs installed at all development or redevelopment projects that disturb greater than or equal to one acre.	Marple Township	Anthony Hamaday	610-356-4040	☐
	4	Review PCSM Plans and require the implementation of structural and/or non-structural BMPs that are appropriate to the local community, that minimize water quality impacts and that are designed to maintain pre-development runoff conditions, and implement a tracking system for qualifying projects and associated PCSM BMPs.	Marple Township	Anthony Hamaday	610-356-4040	☐
#5, Post-Construction Stormwater Management in New Development and Redevelopment	5	Inspect all qualifying development or redevelopment projects to ensure proper installation of the approved structural PCSM BMPs.	Marple Township	Anthony Hamaday	610-356-4040	☐
	6	Develop a written program that describes how the permittee shall implement and enforce all required components of this MCM.	Marple Township	Anthony Hamaday	610-356-4040	☐
	1	Identify and document all operations that are owned or operated by the permittee and have the potential for generating stormwater runoff to the regulated small MS4.	Marple Township	Anthony Hamaday	610-356-4040	☐
#6 – Pollution Prevention / Good Housekeeping	2	Develop, implement and maintain a written O&M program for all operations that could contribute to the discharge of pollutants from the regulated small MS4.	Marple Township	Anthony Hamaday	610-356-4040	☐
	3	Develop and implement an employee training program that addresses appropriate topics to further the goal of preventing or reducing the discharge of pollutants from operations to the regulated small MS4.	Marple Township	Anthony Hamaday	610-356-4040	☐

STORMWATER MANAGEMENT PROGRAM

MOU or Agreement. Attach any Memorandum of Understanding (MOU) or other written agreement that describes the BMP(s) identified above as being the responsibility of another party or a shared responsibility with another party.

Stormwater Management Ordinance. For municipal applicants that are renewing permit coverage, complete the information below and attach the applicant's Stormwater Management Ordinance to the NOI. The box for "Yes" must be checked for one of the three options below. Applicants that lack the authority to enact ordinances and are renewing permit coverage must attach their stormwater management SOP(s).

1.	Has a Stormwater Management Ordinance been enacted that is consistent with either the 2013 or 2022 DEP Model Ordinances?	☐ Yes	Date:	☐ No
2.	Has a Stormwater Management Ordinance been enacted that is consistent with an Act 167 Plan approved by DEP in 2005 or later?	☒ Yes	Date: 9/10/2012	☐ No
3.	Has a Stormwater Management Ordinance been enacted that meets the requirements of the Stormwater Management Ordinance Checklist (for either 2013 or 2022)? If Yes, attach Checklist (3800-PM-BCW0100g).	☐ Yes	Date:	☐ No

COMPLIANCE HISTORY

Existing Permits – Identify all existing environmental permits issued by DEP or EPA to the applicant in the past five years.

Type of Permit	Permit No.	Date Issued	Issued By
MS4	PAI130021	8/2/2013	DEP

Was/Is the facility owner or operator in violation of any DEP regulation, permit, order or schedule of compliance at this or any other facility? ☐ Yes ☐ No

If "Yes," list each permit, order or schedule of compliance and provide current compliance status. Use additional sheets to provide information on all permits.

Permit Program: **Storage Tanks** Permit No.: **210673**

Brief Description of Non-Compliance:

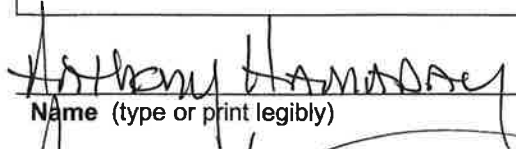
Marple Township Municipal Garage- failure to comply with UST system release detection requirements

Steps Taken to Achieve Compliance	Date(s) Compliance Achieved

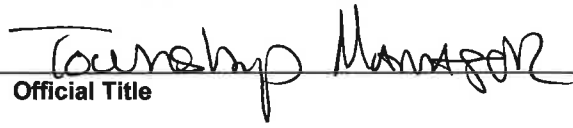
Current Compliance Status: ☒ In Compliance ☐ In Non-Compliance

CERTIFICATION

I certify under penalty of law and subject to the penalties of 18 Pa. C.S.A. Section 4904 (relating to unsworn falsification to authorities) that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I further acknowledge that the MS4 and operator described herein is eligible for coverage under DEP's PAG-13 General Permit, and will operate in compliance with the General Permit. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.


Name (type or print legibly)


Signature


Official Title

Date Signed

POLLUTANT REDUCTION PLAN TOWNSHIP OF MARPLE MS4



Submitted To:

Marple Township
227 South Sproul Road
Broomall, PA 19008
610-356-4040

Submitted By:

Joseph A. Mastronardo, PE
Township Engineer
PA STATE PE: PE056851
Pennoni Associates Inc.
1900 Market Street
Suite 300
Philadelphia, PA 19103

MRPL0401

September 2017

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APPENDICES

- A. Storm Sewershed Map
- B. Pollutant Loading Calculations
- C. Stormwater BMP Concept Plans
- D. Public Comment and Responses

1. EXECUTIVE SUMMARY

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 and the Pennsylvania Clean Streams Law, as amended, 35 P.S. Section 691.1 et seq., Marple Township has developed the following Pollution Reduction Plan to maintain authorization to discharge from a small municipal separate storm sewer system (MS4) to regulated waters of the commonwealth under the National Pollutant Discharge Elimination System (NPDES) Individual Permit.

2. INTRODUCTION

The 2018 NPDES Individual Permit for small MS4's requires Marple Township to implement a Pollution Reduction Plan (PRP) to address stormwater discharges to impaired waters within the Township. A PRP is a planning document intended to guide the selection and implementation of specific Best Management Practices (BMPs) to reduce pollutant loading to surface waters. The ultimate objective of the PRP is to eventually attain the water quality standards and designated/existing uses in accordance with PA Chapter 93- Water Quality Standards. According to the Pennsylvania Department of Environmental Protection's (DEP) "Municipal MS4 Requirements Table" last revised May 9, 2017, the Township's streams are impaired for siltation and a PRP in accordance with Appendix E of the Individual Permit is required to demonstrate a strategy to achieve a 10% reduction in sediment loading by 2023 in each impaired watershed, including Crum Creek, Darby Creek, Hotland Run, Langford Run, Trout Run, and Whetstone Run.

The following Pollutant Loading Analysis and Reduction Plan provides in detail the steps utilized to estimate baseline pollutant loads and planned BMPs and pollutant control measures necessary to achieve the required water quality improvements.

3. POLLUTANT LOADING ANALYSIS AND REDUCTION PLAN

Baseline sediment loading calculations were determined utilizing DEP's "Simplified Method" as demonstrated in Attachment D of the PRP Instructions. Storm sewersheds were delineated for individual outfalls, parsing out areas of private storm sewer, portions of the Township not draining through the municipal storm sewer system, and State highways maintained by PennDOT. GIS software was utilized to determine land cover for each outfall sewershed using the 2011 National Land Cover Database (NLCD) layer for land cover characteristics. Per DEP guidance, the following percentages of impervious coverage were applied to the corresponding land cover:

- Developed Open Space- 19% Impervious
- Low Intensity Impervious- 49% Impervious
- Medium Intensity Impervious- 79% Impervious
- High Intensity Impervious- 100% Impervious

Marple Township is outside of the Chesapeake Bay watershed; therefore, the developed land loading rates set forth in Attachment B of the PRP instructions for "All Other Counties" were utilized to determine the baseline loading rate for sediment.

BMP selection was determined for each impaired watershed based on the HUC-12 level of stream classification. HUC-12 streams within Marple Township include Crum Creek and Darby Creek. Impaired streams within each of the HUC-12 watersheds are indicated on the map included in Appendix A.

3.1 Land Cover Analysis

DARBY CREEK

Darby Creek and tributaries within Marple Township is a designated trout stocked/managed fish (TSF/MF) waterway forming the eastern municipal border with Haverford and Springfield Townships. The Darby Creek sub-watershed within the municipality is an urbanized area encompassing 3,054 acres and containing the following impaired streams:

- Darby Creek
- Langford Run
- Whetstone Run

DEP has not approved a TMDL for these waters, however the impaired status requires the identification and control of pollutant loadings for sediment.

An analysis of existing land cover within the Darby Creek watershed is required to estimate impervious and pervious area. The Darby Creek watershed area was adjusted by parsing land area associated with PennDOT roadways and other land areas, which stormwater runoff does not enter the MS4 (See Appendix A for Storm Sewershed areas). Land areas, where stormwater runoff is managed by an existing BMP, designed and permitted in accordance with Chapter 102 were removed from the watershed (not evaluated; credit not applied). The total and adjusted watershed areas for Darby Creek are:

Watershed Area:	<u>3,054</u> acres
Parsed Area:	<u>1067</u> acres
Chapter 102 BMPs:	<u>0</u> acres
Adjusted Watershed Area:	<u>1,987</u> acres

The following table provides a summary of the land cover and impervious area characteristics for the adjusted Darby Creek watershed:

LAND USE	AREA	IMPERVIOUS	IMPERVIOUS	PERVIOUS
	[ACRE]	[%]	AREA [ACRE]	AREA [ACRE]
Open Space	679	19%	129	550
Low Intensity Development	889	49%	436	453
Medium Intensity Development	193	79%	152	41
High Intensity Development	51	100%	51	0
Deciduous Forest	172	0%	0	172
Mixed Forest	1	0%	0	1
Shrub Scrub	2	0%	0	2
Cultivated Crops	0	0%	0	0
Hay Pasture	0	0%	0	0
TOTAL	1,987	-	768	1,219

CRUM CREEK

Crum Creek and tributaries within Marple Township is a designated warm water fishery/managed fish (WWF/MF) waterway forming the south western municipal border with Upper Providence and Springfield Townships. The Crum Creek sub-watershed within the municipality is an urbanized area encompassing 3,688 acres and containing the following impaired streams:

- Crum Creek
- Hotland Run
- Trout Run
- Martin's Run

DEP has not approved a TMDL for these waters, however the impaired status requires the identification and control of pollutant loadings for sediment.

An analysis of existing land cover within the Crum Creek watershed is required to estimate impervious and pervious area. The Crum Creek watershed area was adjusted by parsing land area associated with PennDOT roadways and other land areas, which stormwater runoff does not enter the MS4 (See Appendix A for Storm Sewershed areas).

Land areas, where stormwater runoff is managed by an existing BMP, designed and permitted in accordance with Chapter 102 were removed from the watershed (not evaluated; credit not applied). The total and adjusted watershed areas for Crum Creek are:

Watershed Area:	3688 acres
Parsed Area:	2638 acres
Chapter 102 BMPs:	0 acres
Adjusted Watershed Area:	1050 acres

The following table provides a summary of the land cover and impervious area characteristics for the adjusted Crum Creek watershed:

LAND USE	AREA	IMPERVIOUS	IMPERVIOUS	PERVIOUS
	[ACRE]	[%]	AREA [ACRE]	AREA [ACRE]
Open Space	467	19%	89	378
Low Intensity Development	376	49%	184	192
Medium Intensity Development	21	79%	16	4
High Intensity Development	4	100%	4	0
Deciduous Forest	153	0%	0	153
Mixed Forest	0	0%	0	0
Shrub Scrub	4	0%	0	4
Cultivated Crops	13	0%	0	13
Hay Pasture	13	0%	0	13
TOTAL	1,050	-	293	758

3.2 Pollutant Loading Summary

A baseline sediment loading rate was calculated using a developed loading rate of 1,839 pounds/acre/year (lb/ac/yr) for impervious areas and 265 lb/ac/yr for pervious areas (See Appendix B for detailed calculations).

DARBY CREEK

Based on the estimated amount of pervious and impervious areas within the adjusted watershed, the baseline sediment loading for Darby Creek is:

	[ACRES]	[LB/AC/YR]	[LB/YR]
Impervious Land Cover	768	1,839	1,412,352
Pervious Land Cover	1,219	265	322,986
TOTAL	1,987	-	1,735,338

In accordance with DEP requirements, a Pollutant Reduction Plan is required in for Darby Creek to reduce sediment load by 10%, or 173,534 lb/yr, by the end of the 2023 permit year.

CRUM CREEK

Based on the estimated amount of pervious and impervious areas within the adjusted watershed, the baseline sediment loading for Crum Creek is:

	[ACRES]	[LB/AC/YR]	[LB/YR]
Impervious Land Cover	293	1,839	538,827
Pervious Land Cover	758	265	200,840
TOTAL	1,051	-	739,667

In accordance with DEP requirements, a Pollutant Reduction Plan is required in for Crum Creek to reduce sediment load by 10%, or 73,967 lb/yr, by the end of the 2023 permit year.

3.3 Pollutant Control Measures

The following stormwater BMPs may be utilized to reduce sediment loading by 10% within the next five years. Descriptions and conceptual designs for stormwater BMPs are provided in Appendix C.

STORMWATER BMP	DESCRIPTION	SEDIMENT EFFECTIVENESS VALUE
Stormwater Management Basin Retrofit Wet Pond	A structure that intercepts stormwater runoff and releases to an open water system. A permanent pool is maintained within the structure, having retention times sufficient to allow settlement of sediments.	60%
Stormwater Management Basin Retrofit Extended Detention	A water impoundment, designed to temporarily store and slowly release stormwater runoff to surface waters or groundwater. Extended detention basins return to a completely dry condition between storm events to maintain treatment capacity.	60%
Infiltration Practices	A depression or trench designed to trap sediment and allow water to infiltrate into the soil.	95%
Bioretention/Rain Gardens	A shallow basin or depression backfilled with engineered media, topsoil, mulch and vegetation, used to temporarily store and treat stormwater runoff by filtering through plant and soil medias.	55% - 90%

STORMWATER BMP	DESCRIPTION	SEDIMENT EFFECTIVENESS VALUE
Stream Restoration	Practices that prevent channel or bank erosions that otherwise would be delivered downstream from an actively enlarging or incising urban stream.	44.88 lbs/ft/yr
Riparian Buffers	An area of trees at least 35 feet wide on one side of a stream, accompanied by trees, shrubs and vegetation adjacent to a body of water. Forested or riparian buffers reduce sediment by filtering stormwater runoff before entering a waterbody.	50%
Storm Sewer Filters	The collection or capture and proper disposal of solid material within the storm sewer system, preventing discharge to surface waters.	80% (max)
Street Sweeping	Routine roadside maintenance to remove sediment and debris, completed a minimum of 25 times per year.	9%

3.4 Pollutant Reduction Summary

A summary of the areas managed by stormwater BMPs and other PCMs and estimated sediment removal for each watershed follow.

DARBY CREEK

To address sediment reduction in Darby Creek, Marple Township proposes to construct rain garden facilities at the Municipal Complex and the proposed Township Fire Station site, and approximately 3,700 LF of streambank restoration. Additional info for the proposed BMPs is provided in Appendix C.

STORMWATER BMP / PCM	SEDIMENT REMOVAL EFFECTIVENESS	MANAGED AREA IMPERVIOUS [ACRES]	MANAGED AREA PERVIOUS [ACRES]	SEDIMENT REMOVAL [LB/YR]
SWM Basin Retrofit - Wet Pond	60%	0	0	0
SWM Basin Retrofit - Extended Detention	60%	0	0	0
Infiltration Practices	95%	0	0	632
Bioretention (C/D Soils with underdrain)	55%	5	0	5,057
Bioretention (A/B soils with underdrain)	80%	0	0	0
Bioretention (A/B soils without underdrain)	90%	0	0	0
Riparian Buffers	50%	0	0	0
Storm Sewer Filters	80%	0	0	0
Street Sweeping	9%	0	0	0
Stream Restoration	Effectiveness Value	44.88	lb/ft/yr	209,455
	Length Restored	4667	ft	
TOTAL SEDIMENT REMOVED				215,144

Based on the required sediment loading reduction of 173,534 lbs/yr, the planned combination of BMPs achieves an expected sediment loading in excess of the required 10%.

CRUM CREEK

To address sediment reduction within the Crum Creek watershed, Marple Township proposes to complete two (2) stormwater management basin retrofits at Stanfield Drive and Paxon Hollow Country Club, construct a bio-swale in Kent Park, and approximately 1,580 LF of streambank restoration. Additional information for the proposed BMPs is provided in Appendix C.

STORMWATER BMP / PCM	SEDIMENT REMOVAL EFFECTIVENESS	MANAGED AREA IMPERVIOUS [ACRES]	MANAGED AREA PERVIOUS [ACRES]	SEDIMENT REMOVAL [LB/YR]
SWM Basin Retrofit - Wet Pond	60%	0	0	0
SWM Basin Retrofit - Extended Detention	60%	1	4	1,899
Infiltration Practices	95%	0	0	0
Bioretention (C/D Soils with underdrain)	55%	0	0	0
Bioretention (A/B soils with underdrain)	80%	0	0	0
Bioretention (A/B soils without underdrain)	90%	0	0	0
Riparian Buffers	50%	0	0	0
Storm Sewer Filters	80%	0	0	0
Street Sweeping	9%	0	0	0
Stream Restoration	Effectiveness Value	44.88 lb/ft/yr		75,802
	Length Restored	1689 ft		
		TOTAL SEDIMENT REMOVED		77,701

Based on the required sediment loading reduction of 73,967 lb/yr, the planned combination of BMPs and pollutant control measures achieves an expected sediment loading in excess of the required 10%.

4. IMPLEMENTATION PLAN

4.1 Funding

The following BMPs will be funded by the taxing authority of Marple Township. State and local grant funding may be pursued to financially assist BMP projects.

PROPOSED BMP	PROPERTY OWNER	ESTIMATED COST (Design & Construction)
Municipal Complex Rain Garden	Marple Township	
Fire Station Rain Garden	Marple Township	
Stanfield Basin	Marple Township	\$115,000
Paxon Hollow Wet Pond	Marple Township	\$150,000
Kent Park Bio-Swale	Marple Township	\$100,000
Streambank Restoration	Marple Township	\$2,800,000

4.2 Ownership and Maintenance

Marple Township currently and will continue to own and maintain the properties planned for BMP improvements. Stormwater BMPs will be appropriately maintained by the Township Public Works and Parks Departments in accordance with the guidelines and standard practices provided in the *Pennsylvania Stormwater BMP Manual*.

Proposed BMP	Maintenance Efforts
Raingarden	Check for and remove detritus accumulated in the basin annually. Prune and cut back perennial plantings at the end of the growing season. Re-spread and amend mulch quantities when erosion is evident and as needed. Once every 2 to 3 years the entire area may require mulch replacement. Inspect bioretention areas two times per year for sediment buildup, erosion, invasive vegetation and plant conditions. Inspect trees and shrubs twice per year to evaluate health; replace as needed to maintain hardy coverage.

Proposed BMP	Maintenance Efforts
Basin Retrofit	Inspect and clear catch basins and inlets (upgradient of infiltration basin) at least two times per year and after runoff events to avoid excessive sediment and debris build-up. Maintain vegetation along the surface of the infiltration basin in good condition, and revegetate any bare spots. Avoid driving vehicles or heavy lawn equipment on the infiltration basin to avoid compaction. Inspect the basin after rain events to confirm that runoff drains to a dry condition within 72 hours. Mosquitos should not be a problem if the water drains in 72 hours. Mosquitoes require a considerably long breeding period with relatively static water levels. Inspect for accumulation of sediment, damage to outlet control structures, erosion control measures, signs of water contamination/spills, and slope stability in the berms; repair as necessary. Inspect earthen berms annually for signs of seepage through the berm; repair as necessary. Mow at the appropriate frequency to maintain vegetative cover. Remove accumulated sediment from basin as required; properly dispose of sediment in accordance with PA DEP Waste Management regulations.
Wet Pond /Wetlands	See Basin Retrofit Maintain constructed wetlands in a natural state in accordance with the PA DEP BMP Manual requirements. An easement or equivalent legal instrument is required for privately owned facilities to prevent neglect or removal. Vegetation is to be inspected and appropriately maintained every 2 to 3 weeks during the first growing season. Inspect a minimum of 4 times per year and after major rainfall events during the first 2 years for erosion and/or sedimentation.
Stream Restoration	Inspect for eroded areas 2 times per year. Re-stabilize as necessary and replace any displaced rock, rip-rap protection, or other constructed energy dissipation measures. Remove invasive vegetation as necessary.

APPENDICIES

APPENDIX A

Storm Sewershed Map

APPENDIX B

Pollutant Loading Calculations

APPENDIX B

WATERSHED SUMMARY

	IMPAIRED STREAMS	DEVELOPED_OPEN	DEVELOPED_HIGH	DEVELOPED_MEDIUM	DEVELOPED_LOW_I	DECIDUOUS FOREST	SHRUB SCRUB	MIXED FOREST	HAY PASTURE	CULTIVATED CROPS
TR	Trout Run	16,652,198	115,788	657,859	13,735,429	4,394,215	90,812	0	0	126,348
DC	Darby Creek	18,099,558	621,334	3,388,400	20,764,726	6,673,558	103,698	47,652	0	0
CC	Crum Creek	1,520,201	0	33,821	962,622	1,510,341	19,742	3,948	394,837	422,476
HR	Hotland Run	213,304	0	2,601	283,539	15,608	57,966	0	0	0
WR	Whetstone Run	4,924,784	1,031,123	2,723,087	3,898,948	540,927	0	0	0	0
LR	Landford Run	6,528,122	567,379	2,264,108	14,055,682	248,747	0	0	0	0
MR	Martins Run	1,964,653	20,857	189,610	1,417,402	764,816	8,274	0	160,306	0

APPENDIX B

OUTFALL/SEWERSHED DATA

WATERSHED	OUTFALL ID	DEVELOPED_OPEN	DEVELOPED_HIGH	DEVELOPED_MEDIU	DEVELOPED_LOW_I	DECIDUOUS_FOREST	SHRUB_SCRUB	MIXED_FOREST	HAY_PASTURE	CULTIVATED_CROPS
TR	TR-1	59,226	0	0	0	59,226	0	0	0	0
TR	TR-2	78,967	0	0	3,948	197,418	0	0	0	0
TR	TR-3	75,019	0	0	31,587	0	0	0	0	0
TR	TR-4	153,986	0	0	0	47,380	0	0	0	0
TR	TR-5	67,122	0	7,897	71,071	0	0	0	0	0
TR	TR-6	311,921	0	0	0	102,658	0	0	0	0
TR	TR-7	118,451	0	0	3,948	11,845	0	0	0	0
TR	TR-8	367,198	0	0	86,864	0	0	0	0	0
TR	TR-9	406,682	0	0	39,484	98,709	0	0	0	0
TR	TR-10	272,437	0	0	7,897	0	0	0	0	0
TR	TR-11	256,644	0	11,845	209,264	0	0	0	0	0
TR	TR-12	31,587	0	0	98,709	0	0	0	0	0
TR	TR-13	27,639	0	15,793	94,761	0	0	0	0	0
TR	TR-14	102,658	0	0	47,380	414,579	3,948	0	0	67,122
TR	TR-15	102,658	0	0	157,935	23,690	0	0	0	0
TR	TR-16	15,793	0	0	15,793	15,793	0	0	0	0
TR	TR-17	118,451	0	0	0	181,625	43,432	0	0	39,484
TR	TR-18	19,742	0	0	0	19,742	0	0	0	19,742
TR	TR-19	0	0	0	0	0	0	0	0	0
TR	TR-20	0	0	0	0	0	0	0	0	0
TR	TR-21	158,678	0	18,209	156,076	257,526	0	0	0	0
TR	TR-22	213,212	0	0	15,793	3,948	0	0	0	0
TR	TR-23	3,948	0	0	43,432	0	0	0	0	0
TR	TR-24	608,049	0	0	738,345	86,864	0	0	0	0
TR	TR-25	39,484	0	0	19,742	0	0	0	0	0
TR	TR-26	3,948	0	0	7,897	0	0	0	0	0
TR	TR-27	1,626,728	43,432	55,277	410,630	848,899	0	0	0	0
TR	TR-28	161,883	0	0	94,761	59,226	0	0	0	0
TR	TR-29	19,742	0	0	23,690	15,793	0	0	0	0
TR	TR-30	7,897	0	0	75,019	0	0	0	0	0
TR	TR-31	205,315	0	0	438,269	0	0	0	0	0
TR	TR-32	90,812	0	15,793	130,296	0	0	0	0	0
TR	TR-33	439,849	0	0	666,764	82,916	0	0	0	0
TR	TR-34	919,970	0	51,329	892,331	0	0	0	0	0
TR	TR-35	15,793	0	0	59,226	0	0	0	0	0
TR	TR-36	15,793	0	0	23,690	0	0	0	0	0
TR	TR-37	15,793	0	0	31,587	0	0	0	0	0
TR	TR-38	0	0	0	0	0	0	0	0	0
TR	TR-39	110,881	0	0	64,103	309,367	0	0	0	0

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OUTFALL/SEWERSHED DATA

WATERSHED	OUTFALL ID	DEVELOPED_OPEN	DEVELOPED_HIGH	DEVELOPED_MEDIU	DEVELOPED_LOW_I	DECIDUOUS_FOREST	SHRUB_SCRUB	MIXED_FOREST	HAY_PASTURE	CULTIVATED_CROPS
TR	TR-40	78,967	0	0	90,812	47,380	0	0	0	0
TR	TR-41	138,193	0	11,845	371,147	19,742	0	0	0	0
TR	TR-42	59,226	0	15,793	201,367	0	0	0	0	0
TR	TR-43	0	0	0	15,793	0	0	0	0	0
TR	TR-44	486,579	0	5,574	542,227	55,277	3,948	0	0	0
TR	TR-45	173,728	0	11,845	138,193	35,535	39,484	0	0	0
TR	TR-46	430,372	0	23,690	323,766	118,451	0	0	0	0
TR	TR-47	189,522	0	0	150,038	0	0	0	0	0
TR	TR-48	19,742	0	0	82,916	47,380	0	0	0	0
TR	TR-49	23,690	0	0	55,277	0	0	0	0	0
TR	TR-50	157,935	0	7,897	213,212	0	0	0	0	0
TR	TR-51	619,894	0	0	722,552	0	0	0	0	0
TR	TR-52	110,554	0	0	118,451	0	0	0	0	0
TR	TR-53	698,861	0	19,742	754,139	280,334	0	0	0	0
TR	TR-54	2,400,609	47,380	114,503	1,520,122	379,043	0	0	0	0
TR	TR-55	0	0	0	0	0	0	0	0	0
TR	TR-56	0	0	0	0	0	0	0	0	0
TR	TR-57	39,484	0	0	134,245	0	0	0	0	0
TR	TR-58	319,818	0	0	430,372	63,174	0	0	0	0
TR	TR-59	98,709	0	0	189,522	19,742	0	0	0	0
TR	TR-60	560,668	0	3,948	509,340	3,948	0	0	0	0
TR	TR-61	1,563,554	3,948	43,432	1,484,587	260,592	0	0	0	0
TR	TR-62	98,709	0	11,845	47,380	7,897	0	0	0	0
TR	TR-63	150,038	0	0	161,883	39,484	0	0	0	0
TR	TR-64	15,793	0	0	35,535	11,845	0	0	0	0
TR	TR-65	272,437	3,948	39,484	236,902	82,916	0	0	0	0
TR	TR-66	94,761	0	31,587	209,264	7,897	0	0	0	0
TR	TR-67	89,160	17,078	140,529	212,402	1,352	0	0	0	0
TR	TR-68	465,908	0	0	23,690	63,174	0	0	0	0
TR	TR-69	51,329	0	0	0	11,845	0	0	0	0
DC	DC-1	27,639	27,639	165,832	19,742	0	0	0	0	0
DC	DC-2	359,302	375,095	908,125	904,177	0	0	0	0	0
DC	DC-3	0	0	11,845	15,793	0	0	0	0	0
DC	DC-4	31,587	0	209,264	426,424	0	0	0	0	0
DC	DC-5	67,122	0	213,212	769,932	0	0	0	0	0
DC	DC-6	19,742	0	75,019	201,367	0	0	0	0	0
DC	DC-7	59,226	0	106,606	138,193	0	0	0	0	0
DC	DC-8	47,380	0	19,742	134,245	0	0	0	0	0
DC	DC-9	150,038	0	157,935	631,739	0	0	0	0	0
DC	DC-10	3,948	0	106,606	153,986	0	0	0	0	0

APPENDIX B

OUTFALL/SEWERSHED DATA

WATERSHED	OUTFALL ID	DEVELOPED_OPEN	DEVELOPED_HIGH	DEVELOPED_MEDIU	DEVELOPED_LOW_I	DECIDUOUS_FOREST	SHRUB_SCRUB	MIXED_FOREST	HAY_PASTURE	CULTIVATED_CROPS
DC	DC-11	181,625	0	55,277	335,611	0	0	0	0	0
DC	DC-12	134,245	0	150,038	635,687	0	0	0	0	0
DC	DC-13	82,916	0	86,864	477,753	0	0	0	0	0
DC	DC-14	244,799	3,948	78,967	493,546	0	0	0	0	0
DC	DC-15	0	0	0	0	0	0	0	0	0
DC	DC-16	0	0	0	0	0	0	0	0	0
DC	DC-17	623,842	0	19,742	1,066,060	260,592	0	0	0	0
DC	DC-18	0	0	0	0	0	0	0	0	0
DC	DC-19	0	0	0	0	0	0	0	0	0
DC	DC-20	0	0	0	0	0	0	0	0	0
DC	DC-21	406,682	0	0	264,541	0	0	0	0	0
DC	DC-22	0	0	0	0	0	0	0	0	0
DC	DC-23	4,086,562	27,639	248,747	2,191,345	939,712	55,277	0	0	0
DC	DC-24	0	0	0	0	0	0	0	0	0
DC	DC-25	0	0	0	0	0	0	0	0	0
DC	DC-26	0	0	0	0	0	0	0	0	0
DC	DC-27	0	0	0	0	0	0	0	0	0
DC	DC-28	0	0	0	0	0	0	0	0	0
DC	DC-29	0	0	0	0	0	0	0	0	0
DC	DC-30	0	0	0	0	0	0	0	0	0
DC	DC-31	0	0	0	0	0	0	0	0	0
DC	DC-32	106,606	0	0	106,606	0	0	0	0	0
DC	DC-33	42,272	0	9,607	118,745	0	0	0	0	0
DC	DC-34	784,072	0	19,599	510,011	70,887	48,420	47,652	0	0
DC	DC-35	0	0	0	0	0	0	0	0	0
DC	DC-36	55,277	0	0	27,639	7,897	0	0	0	0
DC	DC-37	105,295	0	0	107,601	99,915	0	0	0	0
DC	DC-38	82,916	0	0	31,587	51,329	0	0	0	0
DC	DC-39	150,038	0	0	71,071	213,212	0	0	0	0
DC	DC-40	59,226	0	19,742	51,329	35,535	0	0	0	0
DC	DC-41	0	0	3,948	0	0	0	0	0	0
DC	DC-42	0	0	0	0	0	0	0	0	0
DC	DC-43	0	0	0	0	0	0	0	0	0
DC	DC-44	146,090	0	0	43,432	67,122	0	0	0	0
DC	DC-45	126,348	0	19,742	23,690	7,897	0	0	0	0
DC	DC-46	51,329	0	0	173,728	3,948	0	0	0	0
DC	DC-47	20,439	0	4,134	41,574	93	0	0	0	0
DC	DC-48	485,649	0	0	375,095	201,367	0	0	0	0
DC	DC-49	676,757	0	0	357,942	234,039	0	0	0	0
DC	DC-50	4,469,554	138,193	355,353	4,493,244	2,455,886	0	0	0	0

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OUTFALL/SEWERSHED DATA

WATERSHED	OUTFALL ID	DEVELOPED_OPEN	DEVELOPED_HIGH	DEVELOPED_MEDIU	DEVELOPED_LOW_I	DECIDUOUS_FOREST	SHRUB_SCRUB	MIXED_FOREST	HAY_PASTURE	CULTIVATED_CROPS
DC	DC-51	95,644	0	0	234,039	0	0	0	0	0
DC	DC-52	853,554	0	12,318	511,553	258,675	0	0	0	0
DC	DC-53	85,019	3,172	29,186	189,707	15,227	0	0	0	0
DC	DC-54	208,679	0	0	263,022	0	0	0	0	0
DC	DC-55	15,941	23,911	5,072	97,818	0	0	0	0	0
DC	DC-56	32,606	0	0	28,259	0	0	0	0	0
DC	DC-57	235,488	0	0	346,349	2,174	0	0	0	0
DC	DC-58	192,738	0	0	88,399	76,081	0	0	0	0
DC	DC-59	110,861	0	0	20,288	1,449	0	0	0	0
DC	DC-60	28,259	0	9,420	74,632	0	0	0	0	0
DC	DC-61	21,737	20,288	44,199	199,984	0	0	0	0	0
DC	DC-62	173,899	0	0	220,997	7,246	0	0	0	0
DC	DC-63	260,848	1,449	123,178	968,037	2,898	0	0	0	0
DC	DC-64	0	0	0	0	0	0	0	0	0
DC	DC-65	0	0	0	0	0	0	0	0	0
DC	DC-66	153,986	0	0	114,503	23,690	0	0	0	0
DC	DC-67	134,245	0	15,793	165,832	0	0	0	0	0
DC	DC-68	300,076	0	0	627,791	15,793	0	0	0	0
DC	DC-69	240,851	0	23,690	580,410	0	0	0	0	0
LR	LR-1	0	0	0	0	0	0	0	0	0
LR	LR-2	51,329	0	23,690	31,587	35,535	0	0	0	0
LR	LR-3	23,690	0	19,742	232,954	3,948	0	0	0	0
LR	LR-4	130,296	0	114,503	335,611	0	0	0	0	0
LR	LR-5	0	0	0	0	0	0	0	0	0
LR	LR-6	1,133,182	3,948	134,245	1,034,473	0	0	0	0	0
LR	LR-7	43,432	0	0	102,658	0	0	0	0	0
LR	LR-8	110,554	0	35,535	390,889	0	0	0	0	0
LR	LR-9	47,380	0	0	150,038	0	0	0	0	0
LR	LR-10	671,223	0	43,432	1,393,774	3,948	0	0	0	0
LR	LR-11	1,065,984	18,398	179,671	1,653,774	0	0	0	0	0
LR	LR-12	323,766	0	67,122	797,571	0	0	0	0	0
LR	LR-13	1,476,864	147,992	707,959	3,525,191	197,418	0	0	0	0
LR	LR-14	90,812	0	3,948	619,894	7,897	0	0	0	0
LR	LR-15	11,845	0	3,948	122,399	0	0	0	0	0
LR	LR-16	217,160	3,948	248,747	1,038,421	0	0	0	0	0
LR	LR-17	78,967	0	19,742	59,226	0	0	0	0	0
LR	LR-18	0	0	0	0	0	0	0	0	0
LR	LR-19	0	0	0	0	0	0	0	0	0
LR	LR-20	190,890	219,364	357,798	857,580	0	0	0	0	0
LR	LR-21	860,745	173,728	304,024	1,709,644	0	0	0	0	0

APPENDIX B

OUTFALL/SEWERSHED DATA

WATERSHED	OUTFALL ID	DEVELOPED_OPEN	DEVELOPED_HIGH	DEVELOPED_MEDIU	DEVELOPED_LOW_I	DECIDUOUS_FOREST	SHRUB_SCRUB	MIXED_FOREST	HAY_PASTURE	CULTIVATED_CROPS
CC	CC-1	19,742	0	0	39,484	0	0	0	0	0
CC	CC-2	103,615	0	0	121,005	7,970	0	0	0	0
CC	CC-3	51,329	0	0	78,967	0	0	0	0	0
CC	CC-4	7,897	0	0	43,432	0	0	0	0	0
CC	CC-5	3,948	0	0	78,967	0	0	0	0	0
CC	CC-6	643,584	0	0	55,277	525,133	0	0	0	0
CC	CC-7	82,916	0	0	23,690	142,141	0	0	0	0
CC	CC-8	7,897	0	19,742	47,380	0	0	0	0	0
CC	CC-9	7,897	0	0	63,174	0	0	0	0	0
CC	CC-10	11,845	0	3,948	94,761	0	0	0	0	0
CC	CC-11	11,845	0	0	23,690	15,793	0	0	0	0
CC	CC-12	106,606	0	0	86,864	39,484	0	0	0	122,399
CC	CC-13	27,639	0	0	11,845	11,845	0	0	0	59,226
CC	CC-14	181,625	0	0	71,071	63,174	19,742	3,948	394,837	240,851
MR	MR-1	0	0	0	0	0	0	0	0	0
MR	MR-2	0	0	0	0	0	0	0	0	0
MR	MR-3	1,724	689	40,163	43,265	862	0	0	0	0
MR	MR-4	0	0	0	0	0	0	0	0	0
MR	MR-5	36,543	0	0	36,543	9,653	0	0	0	0
MR	MR-6	290,447	20,168	124,798	133,761	37,232	0	0	0	0
MR	MR-7	213,397	0	9,308	166,339	116,179	8,274	0	24,994	0
MR	MR-8	177,888	0	0	101,700	0	0	0	11,721	0
MR	MR-9	89,461	0	9,825	88,082	182,025	0	0	95,494	0
MR	MR-10	0	0	0	0	0	0	0	0	0
MR	MR-11	0	0	0	0	0	0	0	0	0
MR	MR-12	24,085	0	0	21,703	0	0	0	27,924	0
MR	MR-13	262,351	0	0	28,441	145,827	0	0	0	0
MR	MR-14	97,046	0	0	105,664	0	0	0	0	0
MR	MR-15	78,429	0	0	295,101	0	0	0	172	0
MR	MR-16	0	0	0	0	0	0	0	0	0
MR	MR-17	0	0	0	0	0	0	0	0	0
MR	MR-18	0	0	0	0	0	0	0	0	0
MR	MR-19	693,281	0	5,516	396,801	273,038	0	0	0	0
WR	WR-1	27,639	0	43,432	3,948	75,019	0	0	0	0
WR	WR-2	3,948	0	43,432	11,845	43,432	0	0	0	0
WR	WR-3	0	0	0	0	0	0	0	0	0
WR	WR-4	23,690	311,921	631,739	229,005	0	0	0	0	0
WR	WR-5	1,131,981	449,080	1,753,780	3,105,465	0	0	0	0	0
WR	WR-6	0	216,868	49,993	3,948	0	0	0	0	0
WR	WR-7	33,956	9,823	30,930	47,241	0	0	0	0	0

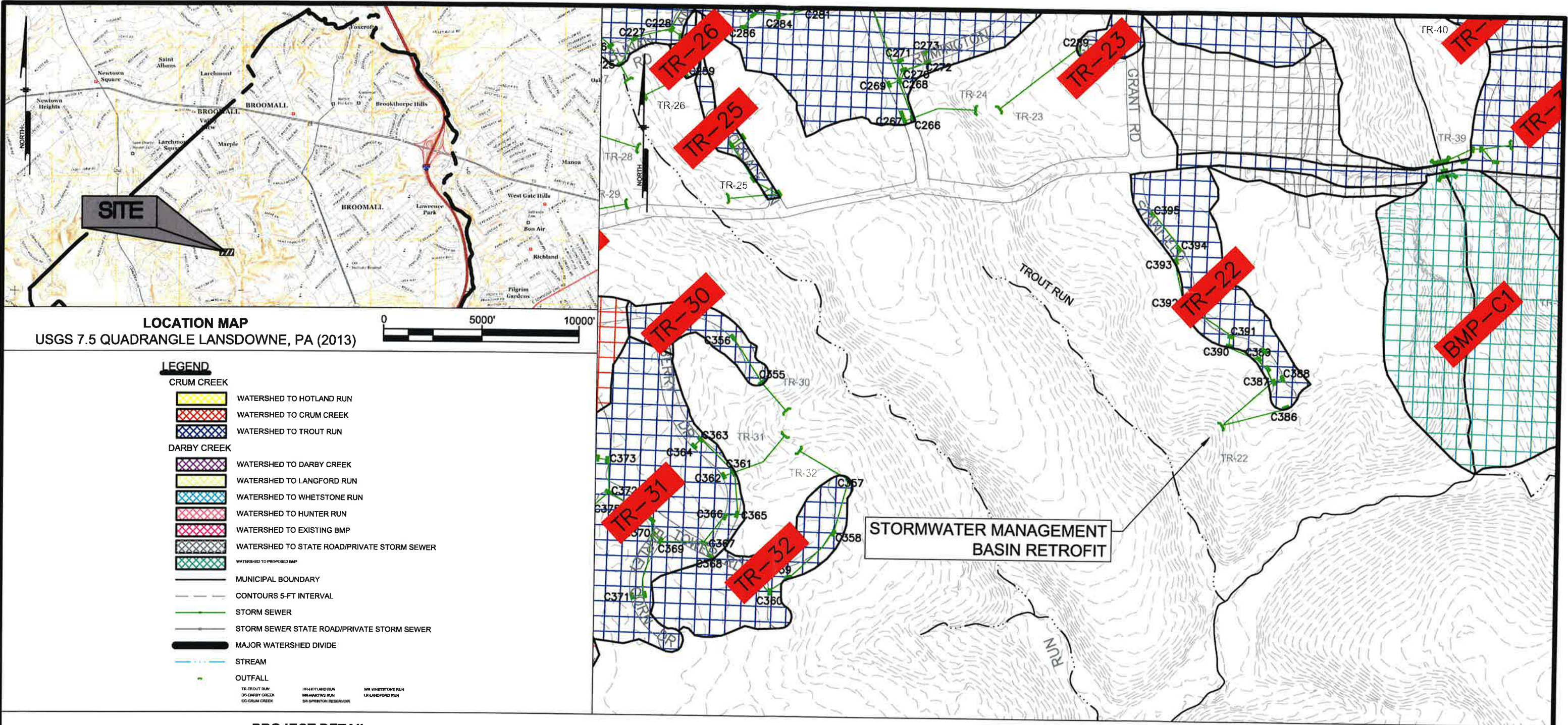
APPENDIX B

OUTFALL/SEWERSHED DATA

WATERSHED	OUTFALL ID	DEVELOPED_OPEN	DEVELOPED_HIGH	DEVELOPED_MEDIU	DEVELOPED_LOW_I	DECIDUOUS FOREST	SHRUB_SCRUB	MIXED_FOREST	HAY_PASTURE	CULTIVATED_CROPS
WR	WR-8	3,703,570	43,432	169,780	497,495	422,476	0	0	0	0
HR	HR-1	0	0	0	0	0	0	0	0	0
HR	HR-2	0	0	0	0	0	0	0	0	0
HR	HR-3	0	0	0	0	0	0	0	0	0
HR	HR-4	0	0	0	0	0	0	0	0	0
HR	HR-5	0	0	0	0	0	0	0	0	0
HR	HR-6	0	0	0	0	0	0	0	0	0
HR	HR-10	213,304	0	2,601	283,539	15,608	57,966	0	0	0
CC	BMP-C1	212,742	0	0	72,361	683,091	0	0	0	0
CC	BMP-C2	39,075	0	10,131	50,653	21,708	0	0	0	0
DC	BMP-D1	111,436	0	7,236	43,417	344,440	0	0	0	0
DC	BMP-D2	178,009	0	4,342	134,592	99,859	0	0	0	0
DC	BMP-D3	233,004	0	0	144,723	560,077	0	0	0	0
DC	BMP-D4	544,157	0	68,020	316,943	616,519	0	0	0	0

APPENDIX C

Stormwater BMP Concept Plans



PROJECT DETAIL
TYPE: STORMWATER MANAGEMENT BASIN RETROFIT
DESCRIPTION: TR-22

WATERSHED MAP



POLLUTANT LOADING TABLE

WATERSHED	CRUM CREEK
WATERSHED AREA	5.35 ACRES
TSS REDUCTION EFFICIENCY	55 %
REMOVAL CALCULATION	3,160 LBS/YR X 55 %
TOTAL POLLUTANT REMOVED	1,738 LBS/YR



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**TOWNSHIP OF MARPLE
POLLUTION REDUCTION PLAN
CRUM CREEK SWM BASIN RETROFIT
MARPLE TOWNSHIP, PA**

PROJECT	MRPL0401
DATE	2016-06-29
DRAWING SCALE	AS NOTED
DRAWN BY	RKM
APPROVED BY	JAM
SHEET	1 OF 1

P:\PROJECTS\MRPL0401\MSA\DESIGN\DWG\TEMPLATE\BASIN RETROFIT TEMPLATE - CRUM1.DWG
PLOTTED: 10/3/2014 4:08:04 PM BY: RYAN MINNICK PLOTSTYLE: PENNONI.NCS STYLE: PROJECT STATUS: ---



LOCATION MAP
USGS 7.5 QUADRANGLE LANSDOWNE, PA (2013)

LEGEND

- CRUM CREEK
- WATERSHED TO HOTLAND RUN
 - WATERSHED TO CRUM CREEK
 - WATERSHED TO TROUT RUN
- DARBY CREEK
- WATERSHED TO DARBY CREEK
 - WATERSHED TO LANGFORD RUN
 - WATERSHED TO WHETSTONE RUN
 - WATERSHED TO HUNTER RUN
 - WATERSHED TO EXISTING BMP
 - WATERSHED TO STATE ROAD/PRIVATE STORM SEWER
 - WATERSHED TO PROPOSED BMP
- MUNICIPAL BOUNDARY
- CONTOURS 5-FT INTERVAL
- STORM SEWER
- STORM SEWER STATE ROAD/PRIVATE STORM SEWER
- MAJOR WATERSHED DIVIDE
- STREAM
- OUTFALL
- TR TROUT RUN
DC DARBY CREEK
CC CRUM CREEK
- HR HOTLAND RUN
WR WHETSTONE RUN
LR LANGFORD RUN

PROJECT DETAIL
TYPE: STORMWATER MANAGEMENT BASIN
DESCRIPTION: MUNICIPAL PARKING LOT

WATERSHED MAP



POLLUTANT LOADING TABLE

WATERSHED	DARBY CREEK
WATERSHED AREA	0.55 ACRES
TSS REDUCTION EFFICIENCY	95 %
REMOVAL CALCULATION	665 LBS/YR X 95 %
TOTAL POLLUTANT REMOVED	632 LBS/YR

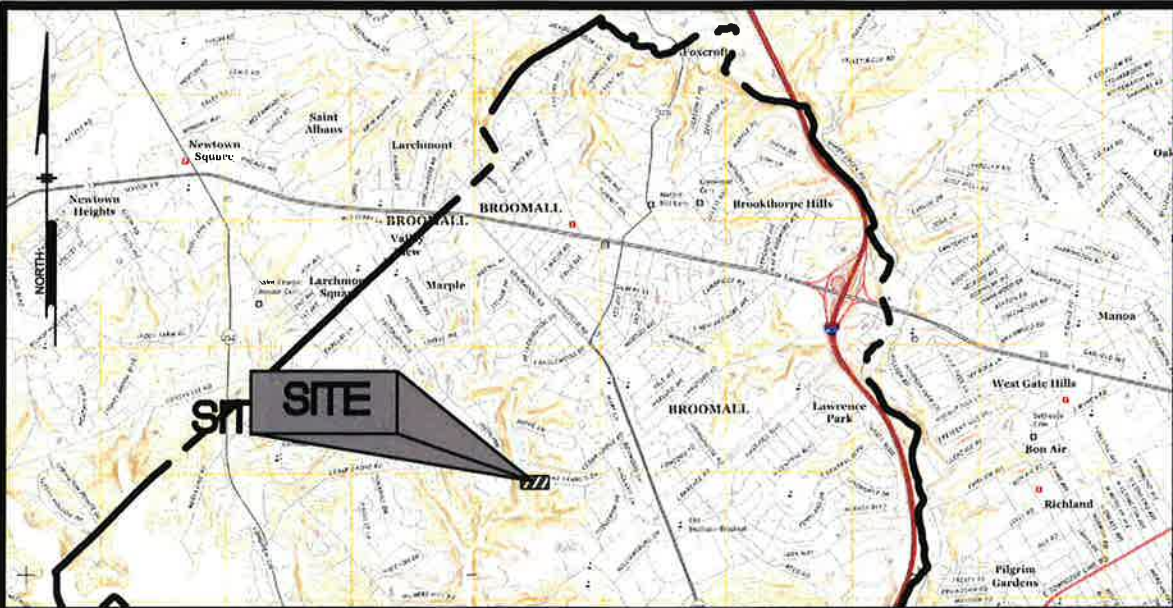


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TOWNSHIP OF MARPLE
POLLUTION REDUCTION PLAN
DARBY CREEK SWM BASIN
MARPLE TOWNSHIP, PA

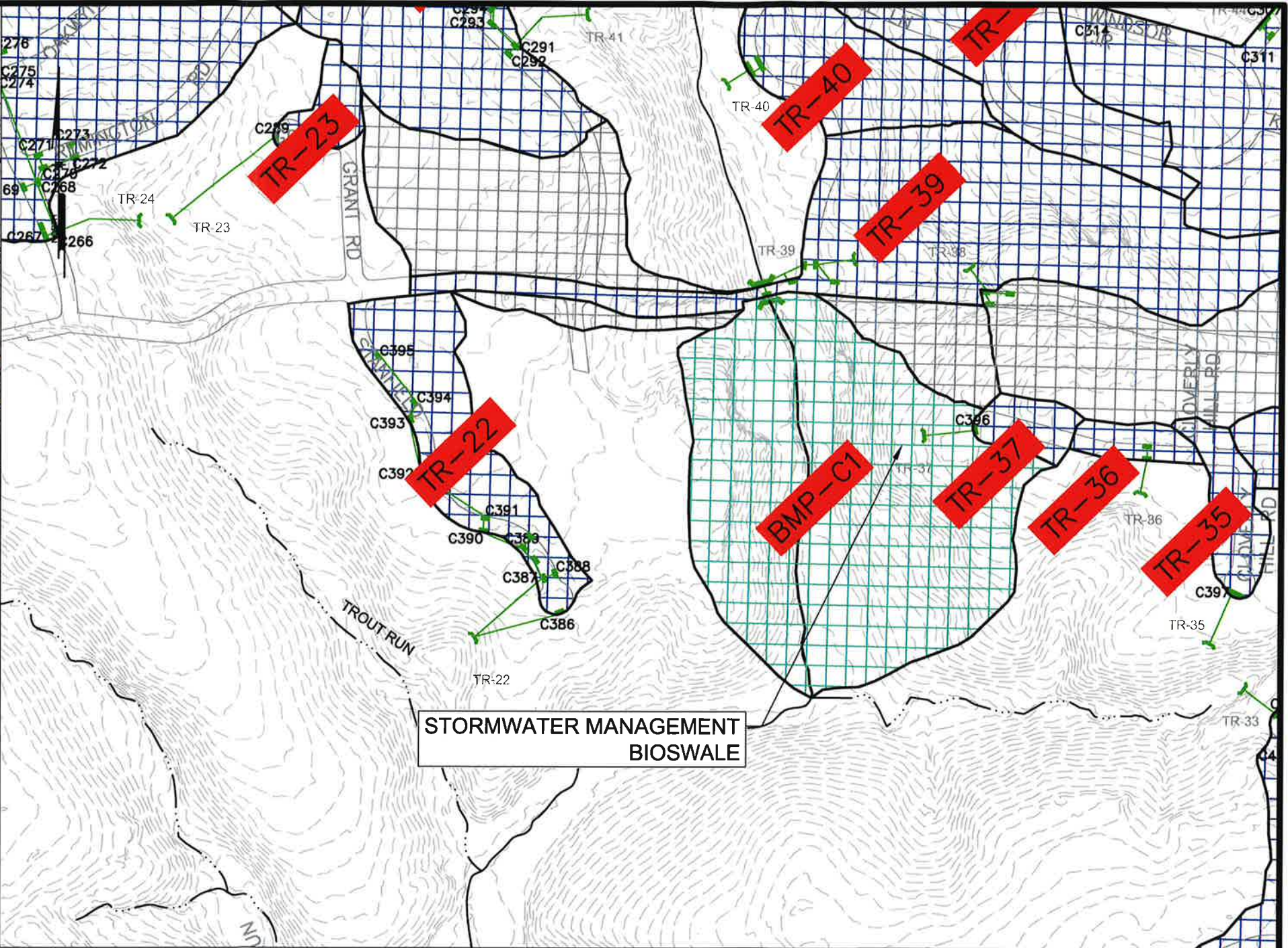
PROJECT	MRPL0401
DATE	2016-06-29
DRAWING SCALE	AS NOTED
DRAWN BY	RKM
APPROVED BY	JAM
SHEET	1 OF 1



LOCATION MAP
USGS 7.5 QUADRANGLE LANSDOWNE, PA (2013)

LEGEND

- CRUM CREEK**
- WATERSHED TO HOTLAND RUN
 - WATERSHED TO CRUM CREEK
 - WATERSHED TO TROUT RUN
- DARBY CREEK**
- WATERSHED TO DARBY CREEK
 - WATERSHED TO LANGFORD RUN
 - WATERSHED TO WHETSTONE RUN
 - WATERSHED TO HUNTER RUN
 - WATERSHED TO EXISTING BMP
 - WATERSHED TO STATE ROAD/PRIVATE STORM SEWER
 - WATERSHED TO PROPOSED BMP
- OTHER FEATURES**
- MUNICIPAL BOUNDARY
 - CONTOURS 5-FT INTERVAL
 - STORM SEWER
 - STORM SEWER STATE ROAD/PRIVATE STORM SEWER
 - MAJOR WATERSHED DIVIDE
 - STREAM
 - OUTFALL
- TR-37 WATERSHED**
- TR-37 WATERSHED
 - TR-37 WATERSHED
 - TR-37 WATERSHED



WATERSHED MAP



PROJECT DETAIL
TYPE: STORMWATER MANAGEMENT BIOSWALE
DESCRIPTION: TR-37

POLLUTANT LOADING TABLE

WATERSHED	CRUM CREEK
WATERSHED AREA	1.09 ACRES
TSS REDUCTION EFFICIENCY	80 %
REMOVAL CALCULATION	956 LBS/YR X 80 %
TOTAL POLLUTANT REMOVED	765 LBS/YR

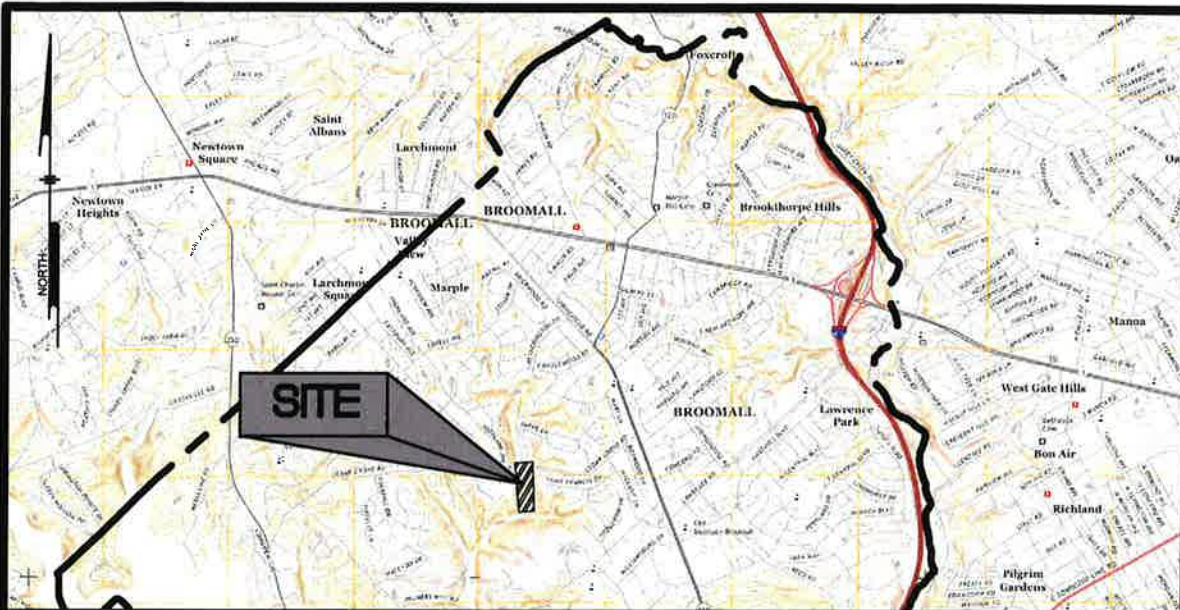


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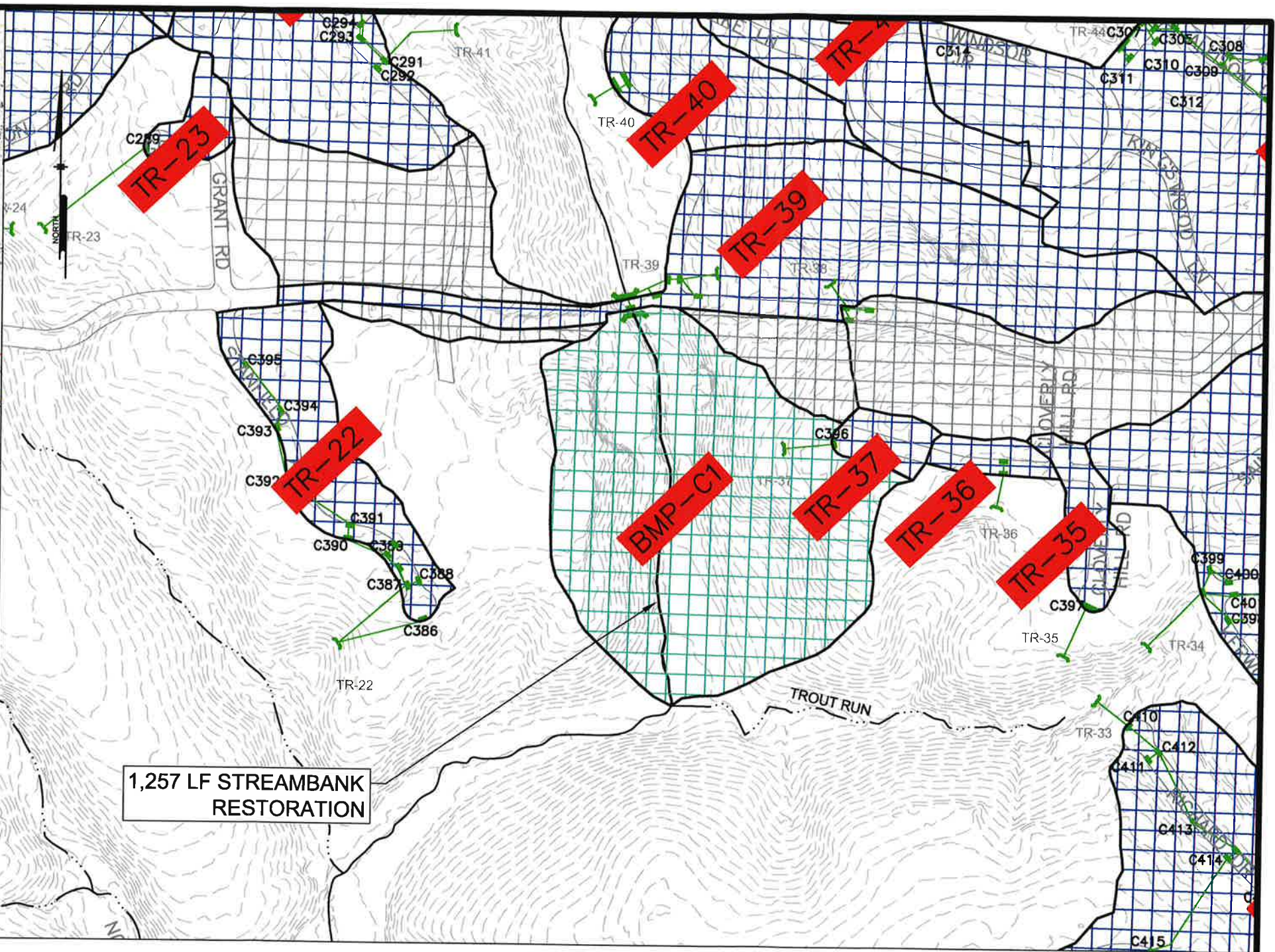
TOWNSHIP OF MARPLE
POLLUTION REDUCTION PLAN
CRUM CREEK BIOSWALE
MARPLE TOWNSHIP, PA

PROJECT	MRPL0401
DATE	2016-06-29
DRAWING SCALE	AS NOTED
DRAWN BY	RKM
APPROVED BY	JAM
SHEET	1 OF 1



LOCATION MAP
USGS 7.5 QUADRANGLE LANSDOWNE, PA (2013)

- LEGEND**
- CRUM CREEK**
- WATERSHED TO HOTLAND RUN
 - WATERSHED TO CRUM CREEK
 - WATERSHED TO TROUT RUN
- DARBY CREEK**
- WATERSHED TO DARBY CREEK
 - WATERSHED TO LANGFORD RUN
 - WATERSHED TO WHETSTONE RUN
 - WATERSHED TO HUNTER RUN
 - WATERSHED TO EXISTING BMP
 - WATERSHED TO STATE ROAD/PRIVATE STORM SEWER
 - WATERSHED TO PROPOSED BMP
- OTHER FEATURES**
- MUNICIPAL BOUNDARY
 - CONTOURS 5-FT INTERVAL
 - STORM SEWER
 - STORM SEWER STATE ROAD/PRIVATE STORM SEWER
 - MAJOR WATERSHED DIVIDE
 - STREAM
 - OUTFALL
- WATERSHEDS TO**
- TR-TROUT RUN
 - DC-DARBY CREEK
 - CC-CRUM CREEK
 - HR-HOTLAND RUN
 - MR-MARTINE RUN
 - SR-SPRINGFIELD RESERVOIR
 - WR-WHETSTONE RUN
 - LR-LANFORD RUN



1,257 LF STREAMBANK
RESTORATION

PROJECT DETAIL
TYPE: STREAMBANK STABILIZATION
DESCRIPTION: 1,257 LF BANK STABILIZATION

WATERSHED MAP



POLLUTANT LOADING TABLE

WATERSHED	CRUM CREEK
WATERSHED AREA	22.15 ACRES
TSS REDUCTION EFFICIENCY	44.88 LBS/FT/YR
REMOVAL CALCULATION	1,257 FT X 44.88 LBS/FT/YR
TOTAL POLLUTANT REMOVED	56,414 LBS/YR



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**TOWNSHIP OF MARPLE
POLLUTION REDUCTION PLAN
CRUM CREEK STREAM BANK STABILIZATION
MARPLE TOWNSHIP, PA**

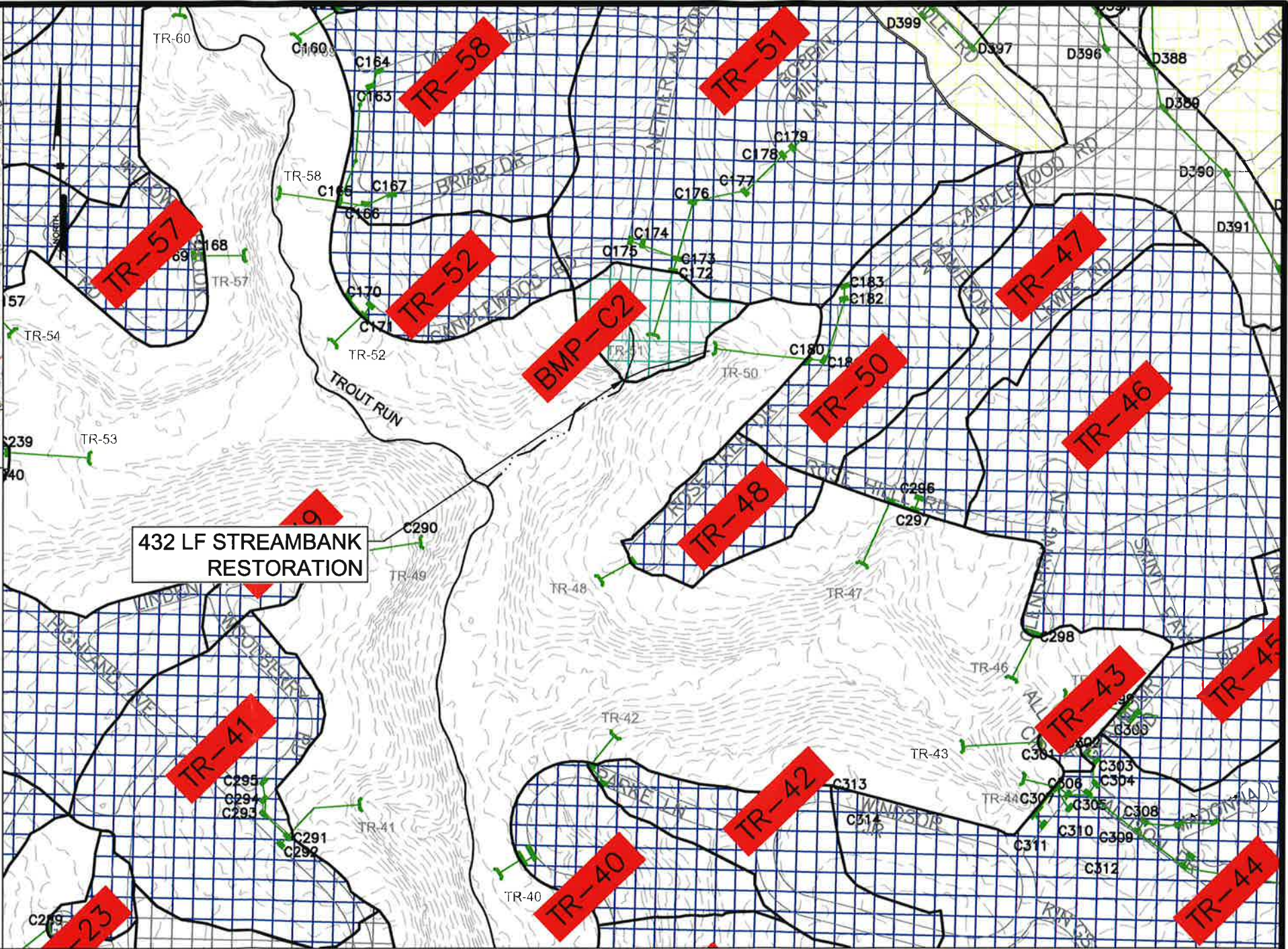
PROJECT	MRPL0401
DATE	2016-06-29
DRAWING SCALE	AS NOTED
DRAWN BY	RKM
APPROVED BY	JAM
SHEET	1 OF 1



LOCATION MAP
USGS 7.5 QUADRANGLE LANSDOWNE, PA (2013)

LEGEND

- CRUM CREEK**
- WATERSHED TO HOTLAND RUN
 - WATERSHED TO CRUM CREEK
 - WATERSHED TO TROUT RUN
- DARBY CREEK**
- WATERSHED TO DARBY CREEK
 - WATERSHED TO LANGFORD RUN
 - WATERSHED TO WHETSTONE RUN
 - WATERSHED TO HUNTER RUN
 - WATERSHED TO EXISTING BMP
 - WATERSHED TO STATE ROAD/PRIVATE STORM SEWER
 - WATERSHED TO PROPOSED BMP
- OTHER FEATURES**
- MUNICIPAL BOUNDARY
 - CONTOURS 5-FT INTERVAL
 - STORM SEWER
 - STORM SEWER STATE ROAD/PRIVATE STORM SEWER
 - MAJOR WATERSHED DIVIDE
 - STREAM
 - OUTFALL



432 LF STREAMBANK
RESTORATION

PROJECT DETAIL
TYPE: STREAMBANK STABILIZATION
DESCRIPTION: 432 LF BANK STABILIZATION

WATERSHED MAP

POLLUTANT LOADING TABLE

WATERSHED	CRUM CREEK
WATERSHED AREA	2.79 ACRES
TSS REDUCTION EFFICIENCY	44.88 LBS/FT/YR
REMOVAL CALCULATION	432 FT X 44.88 LBS/FT/YR
TOTAL POLLUTANT REMOVED	19,388 LBS/YR

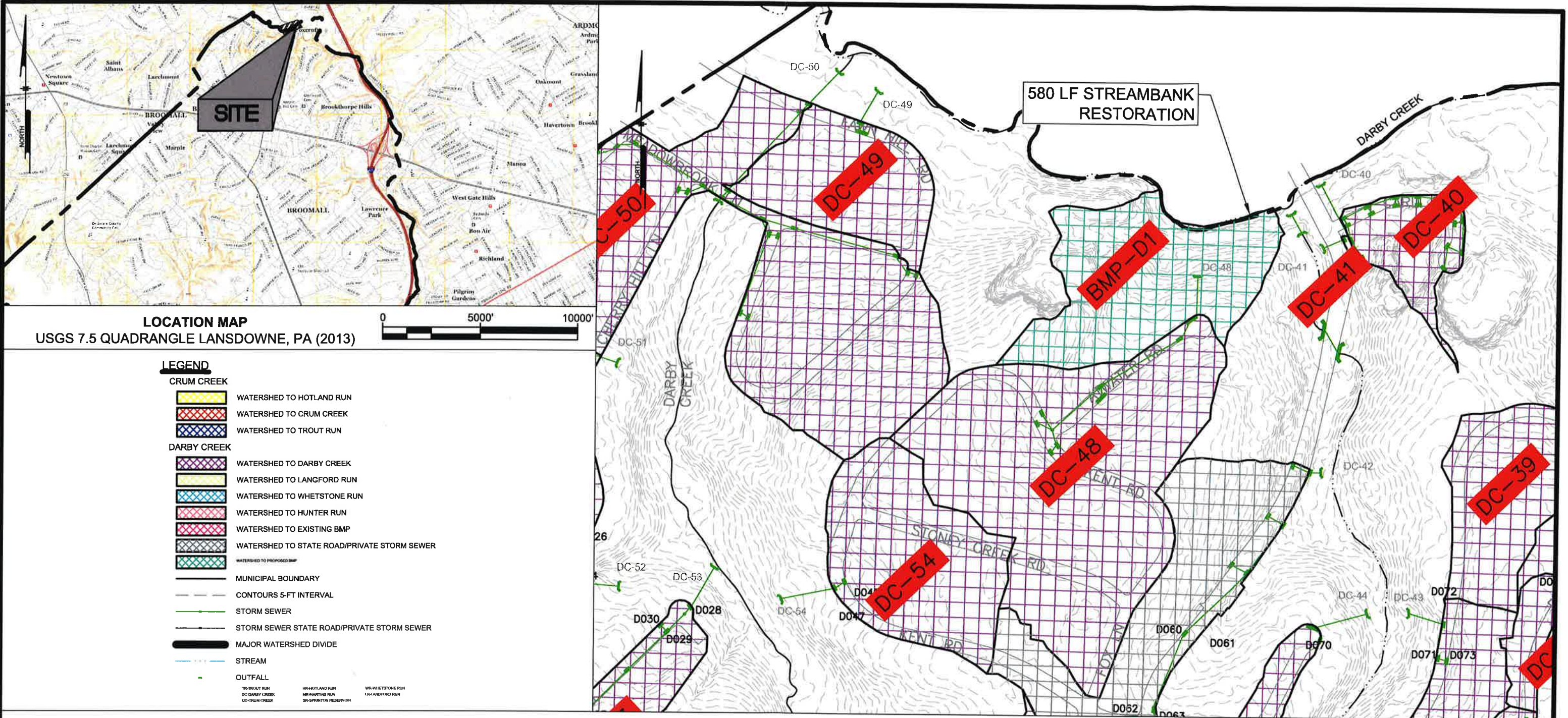


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**TOWNSHIP OF MARPLE
POLLUTION REDUCTION PLAN
CRUM CREEK STREAM BANK STABILIZATION
MARPLE TOWNSHIP, PA**

PROJECT	MRPL0401
DATE	2016-06-29
DRAWING SCALE	AS NOTED
DRAWN BY	RKM
APPROVED BY	JAM
SHEET	1 OF 1



PROJECT DETAIL
TYPE: STREAMBANK STABILIZATION
DESCRIPTION: 580 LF BANK STABILIZATION

POLLUTANT LOADING TABLE

WATERSHED	DARBY CREEK
WATERSHED AREA	11.46 ACRES
TSS REDUCTION EFFICIENCY	44.88 LBS/FT/YR
REMOVAL CALCULATION	580 FT X 44.88 LBS/FT/YR
TOTAL POLLUTANT REMOVED	26,030 LBS/YR



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TOWNSHIP OF MARPLE
POLLUTION REDUCTION PLAN
DARBY CREEK STREAM BANK STABILIZATION
MARPLE TOWNSHIP, PA

PROJECT	MRPL0401
DATE	2016-06-29
DRAWING SCALE	AS NOTED
DRAWN BY	RKM
APPROVED BY	JAM
SHEET	1 OF 1



LOCATION MAP
USGS 7.5 QUADRANGLE LANSDOWNE, PA (2013)

LEGEND

- CRUM CREEK
- WATERSHED TO HOTLAND RUN
 - WATERSHED TO CRUM CREEK
 - WATERSHED TO TROUT RUN
- DARBY CREEK
- WATERSHED TO DARBY CREEK
 - WATERSHED TO LANGFORD RUN
 - WATERSHED TO WHETSTONE RUN
 - WATERSHED TO HUNTER RUN
 - WATERSHED TO EXISTING BMP
 - WATERSHED TO STATE ROAD/PRIVATE STORM SEWER
 - WATERSHED TO PROPOSED BMP
- MUNICIPAL BOUNDARY
- CONTOURS 5-FT INTERVAL
- STORM SEWER
- STORM SEWER STATE ROAD/PRIVATE STORM SEWER
- MAJOR WATERSHED DIVIDE
- STREAM
- OUTFALL
- TR-TROUT RUN
DO-GARBY CREEK
DO-CRUM CREEK
- MR-HOTLAND RUN
MR-HUNTER RUN
MR-SPRING RESERVOIR
- MR-WHETSTONE RUN
MR-LANGFORD RUN

PROJECT DETAIL
TYPE: STREAMBANK STABILIZATION
DESCRIPTION: 806 LF BANK STABILIZATION

WATERSHED MAP



POLLUTANT LOADING TABLE

WATERSHED	DARBY CREEK
WATERSHED AREA	9.65 ACRES
TSS REDUCTION EFFICIENCY	44.88 LBS/FT/YR
REMOVAL CALCULATION	806 FT X 44.88 LBS/FT/YR
TOTAL POLLUTANT REMOVED	36,173 LBS/YR

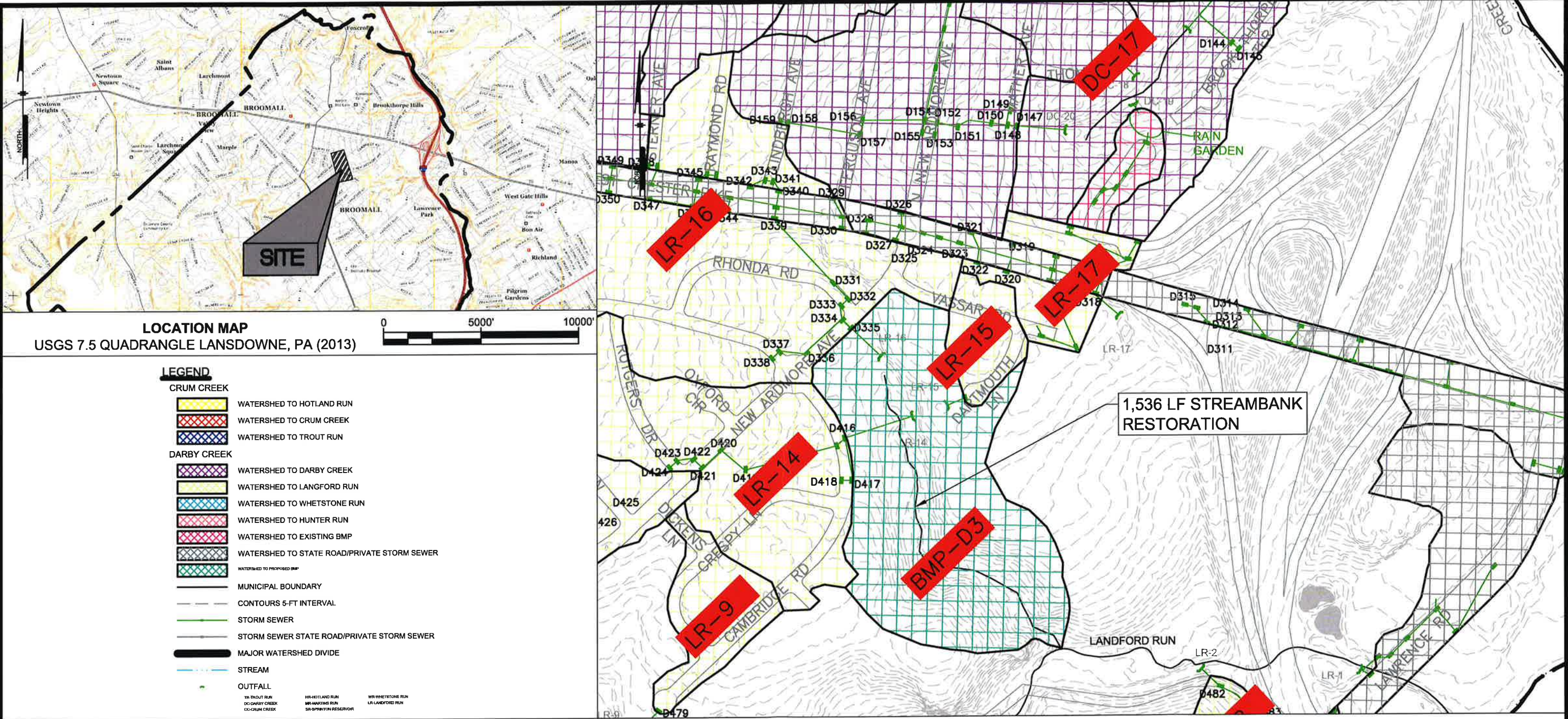


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TOWNSHIP OF MARPLE
POLLUTION REDUCTION PLAN
DARBY CREEK STREAM BANK STABILIZATION
MARPLE TOWNSHIP, PA

PROJECT	MRPL0401
DATE	2016-06-29
DRAWING SCALE	AS NOTED
DRAWN BY	RKM
APPROVED BY	JAM



PROJECT DETAIL
TYPE: STREAMBANK STABILIZATION
DESCRIPTION: 1,536 LF BANK STABILIZATION

POLLUTANT LOADING TABLE

WATERSHED	DARBY CREEK
WATERSHED AREA	21.58 ACRES
TSS REDUCTION EFFICIENCY	44.88 LBS/FT/YR
REMOVAL CALCULATION	1,536 FT X 44.88 LBS/FT/YR
TOTAL POLLUTANT REMOVED	68,936 LBS/YR

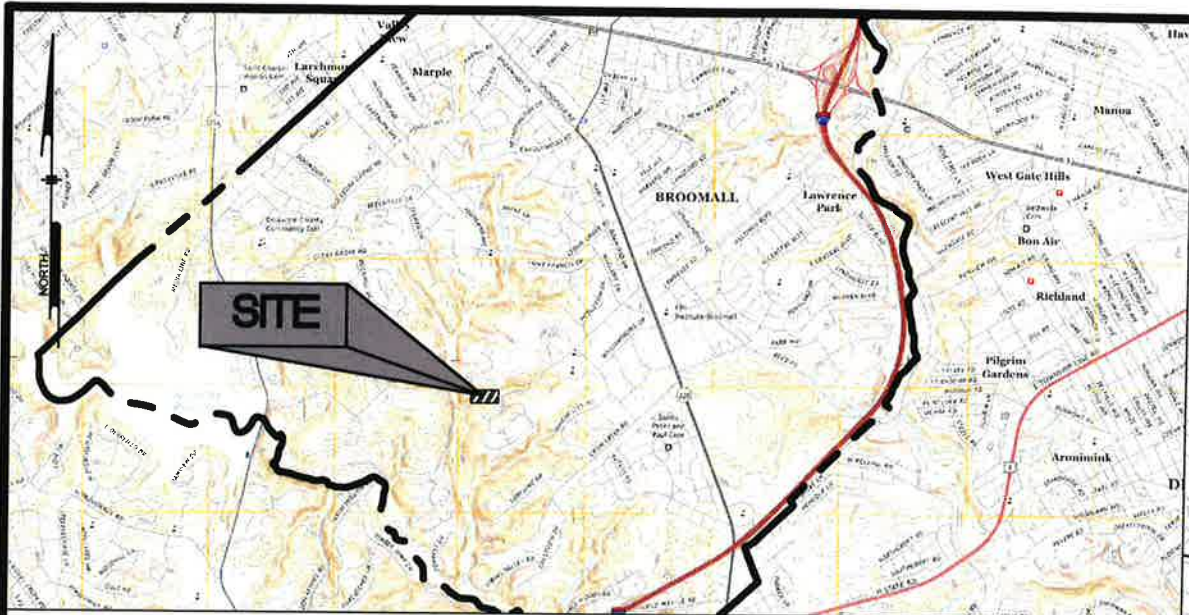


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**TOWNSHIP OF MARPLE
POLLUTION REDUCTION PLAN
DARBY CREEK STREAM BANK STABILIZATION
MARPLE TOWNSHIP, PA**

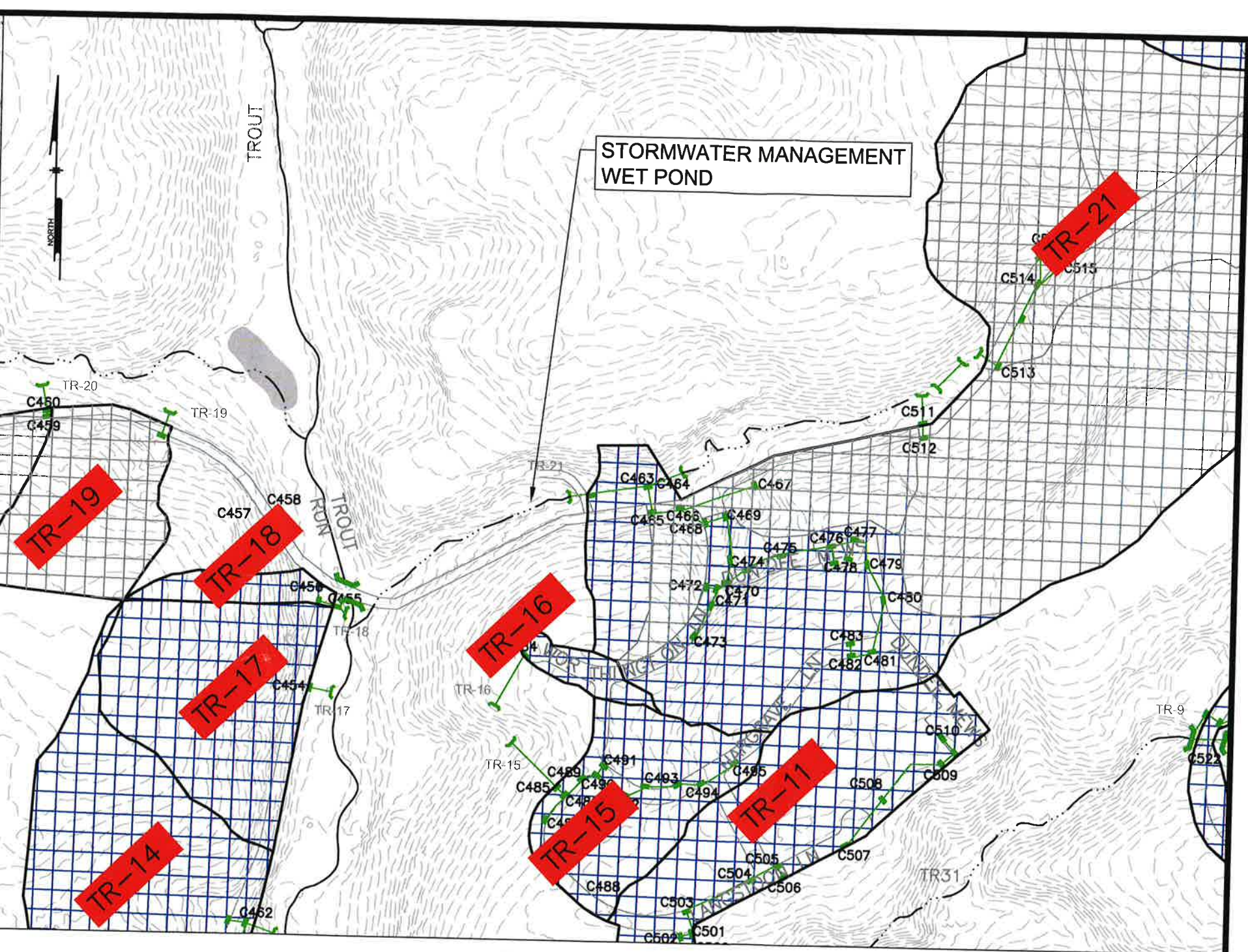
PROJECT	MRPL0401
DATE	2016-06-29
DRAWING SCALE	AS NOTED
DRAWN BY	RKM
APPROVED BY	JAM
SHEET	1 OF 1



LOCATION MAP
USGS 7.5 QUADRANGLE LANSDOWNE, PA (2013)

LEGEND

- CRUM CREEK**
- WATERSHED TO HOTLAND RUN
 - WATERSHED TO CRUM CREEK
 - WATERSHED TO TROUT RUN
- DARBY CREEK**
- WATERSHED TO DARBY CREEK
 - WATERSHED TO LANGFORD RUN
 - WATERSHED TO WHETSTONE RUN
 - WATERSHED TO HUNTER RUN
 - WATERSHED TO EXISTING BMP
 - WATERSHED TO STATE ROAD/PRIVATE STORM SEWER
 - WATERSHED TO PROPOSED BMP
- MUNICIPAL BOUNDARY**
- CONTOURS 5-FT INTERVAL**
- STORM SEWER**
- STORM SEWER STATE ROAD/PRIVATE STORM SEWER**
- MAJOR WATERSHED DIVIDE**
- STREAM**
- OUTFALL**
- TR-TROUT RUN
CR-DARBY CREEK
CR-CRUM CREEK
- TR-HOTLAND RUN
MR-HARTING RUN
SR-SPRINGTON RESERVOIR
- WR-WHETSTONE RUN
LR-LANGFORD RUN



WATERSHED MAP

PROJECT DETAIL
TYPE: STORMWATER MANAGEMENT WET POND
DESCRIPTION: TR-21

POLLUTANT LOADING TABLE

WATERSHED	CRUM CREEK
WATERSHED AREA	13.56 ACRES
TSS REDUCTION EFFICIENCY	60 %
REMOVAL CALCULATION	7,965 LBS/YR X 60 %
TOTAL POLLUTANT REMOVED	4,779 LBS/YR



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1900 Market Street, Suite 300
Philadelphia, PA 19103
T 215.222.3000 F 215.222.3588

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TOWNSHIP OF MARPLE
POLLUTION REDUCTION PLAN
CRUM CREEK SWM WET POND
MARPLE TOWNSHIP, PA

PROJECT	MRPL0401
DATE	2016-06-29
DRAWING SCALE	AS NOTED
DRAWN BY	RKM
APPROVED BY	JAM

SHEET 1 OF 1

APPENDIX D

Public Comment and Responses

No comments were received by the Township in response to the advertisement or public meeting regarding the proposed Pollution Reduction Plan.

AFFIDAVIT OF PUBLICATION
639 S. Chester Rd. • Swarthmore, PA 19081

MARPLE TOWNSHIP
227 S. SPROUL RD
BROOMALL, PA 19008
Attention:

**STATE OF PENNSYLVANIA,
COUNTY OF DELAWARE**

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

MARPLE TOWNSHIP**Published in the following edition(s):**

Daily Times and Sunday Times	06/29/17
Daily & Sunday Times Digital	06/29/17

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

Sworn to the subscribed before me this June 27, 2017.

Dianne McCormick
Notary Public, State of Pennsylvania
Acting in County of Delaware

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

**TOWNSHIP of MARPLE
Delaware County, PA**

NOTICE IS HEREBY GIVEN that beginning July 6, 2017, the Board of Commissioners of Marple Township, Delaware County, will accept written comments for 40 days on plans (available at the Marple Township Building) for the NPDES Stormwater Discharges from the Small Municipal Separate Storm Sewer Systems (MS4) Pollutant Reduction Plan (PRP). Interested persons will also be able to provide comments at the scheduled public meeting on Monday, August 14, 2017 at 7:00 P.M. (EDT) at the Township Building, 227 South Sproul Road, Broomall, PA 19008. The public is invited to attend.

Sharon Angelaccio
Township Secretary
DCT, June 29, a-1

Advertisement Information

Client Id: 881505

Ad Id: 1372518

PO:

Sales Person: 066305

177.78