COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

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)				DEP USE ONLY
Client ID#	78155	**APS ID#**		Date Received
Site ID#	613963	**Auth ID#**	943453	
Facility ID#				PA_____ PDG?

GENERAL INFORMATION

Type of Permit: ☐ New Permit ☒ Renewal of Permit Permit No.: PAG130047

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		
78155	**MUNI**		
Organization Name or Registered Fictitious Name		Employer ID# (EIN)	Dun & Bradstreet ID#
Birmingham Township		**231715259**	
Mailing Address Line 1	Mailing Address Line 2		
1040 West Street Road			
Address Last Line – City	State	ZIP+4	Country
West Chester	**PA**	**19382-8012**	**United States**
Client Contact Last Name	First Name	MI	Suffix
Nelling	**Quina**		
Client Contact Title	Phone	Ext	
Township Secretary/Treasurer	**610.793.2600**		
Email Address	FAX		
birminghamtwp@comcast.net or quinanelling@comcast.net			

MS4 SITE INFORMATION

DEP Site ID#	Site Name					
613963	**Birmingham Township MS4**					
Urbanized Area (UA) Name(s)		UA Area (specify acres or mi^2)				
Philaelphia, Southwest Portion		**2,412 ac+/- within TWP boundaries**				
County Name	Municipality Name	City	Boro	Twp	State	
Chester	**Birmingham**	☐	☐	☒		
County Name	Municipality Name	City	Boro	Twp	State	
		☐	☐	☐		
Site Location Address Line 1	Site Location Address Line 2					

Site Location City	State	ZIP+4	
Detailed Written Directions to Site			
Site Contact Last Name	First Name	MI	Suffix
Site Contact Title	Site Contact Firm		
Mailing Address Line 1	Mailing Address Line 2		
Address Last Line – City	State	ZIP+4	
Phone Ext	FAX	Email Address	
SIC Code(s) (List All That Apply)		NAICS Code(s)	
Site-to-Client Relationship			

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?
Brandywine Creek (B15, via tributary)	no direct discharge	WWF	Y	Y	Y
Radley Run (02040205000806)	050	WWF	Y	Y	Y
SB Radley Run (02040205003201)	041	WWF	Y	Y	Y
Brandywine Creek (B16, via tributary)	no direct discharge	WWF	Y	Y	N
NB Wylie Run (02040205000810)	066	WWF	Y	Y	N
SB Wylie Run (02040205003203)	102	WWF	Y	Y	N
Chester Creek	096	Aquatic Life	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
050	39	45	18.43	75	37	11.75
041	39	54	15.14	75	36	42.71
066	39	53	52.61	75	35	30.97
102	39	53	36.02	75	35	36.30
096	39	54	5.78	75	33	58.72
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.

Surface Water Name	TMDL Name	Pollutant Name	TMDL WLA (lbs/yr)	Specific or General
Radley Run	Municipal	Sediment	LA 260700	Specific
SB Radley Run	Municipal	Sediment	LA 260700	Specific
Brandywine Creek (B15)	Municipal	Sediment	LA 260700	Specific

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.	Birmingham Twp.	Quina Nelling	610.793.2600	☐
	2	Develop and maintain lists of target audience groups that are present within the areas served by the permittee's regulated small MS4.	Birmingham Twp.	Quina Nelling	610.793.2600	☐
	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.	Birmingham Twp.	Quina Nelling	610.793.2600	☐
	4	Distribute stormwater educational materials and/or information to the target audiences using two methods annually.	Birmingham Twp.	Quina Nelling	610.793.2600	☐
#2 – Public Participation and Involvement	1	Develop, implement and maintain a written Public Involvement and Participation Program (PIPP).	Township Engineer	James Hatfield, PE	302.764.7635	☐
	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.	Township Engineer	James Hatfield, PE	302.764.7635	☐
	3	Regularly solicit public involvement and participation from the target audience groups using available distribution and outreach methods.	Township Engineer	James Hatfield, PE	302.764.7635	☐
#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.	Township Engineer	James Hatfield, PE	302.764.7635	☐
	2	Develop and maintain a map of the regulated small MS4's outfalls and surface waters.	Township Engineer	James Hatfield, PE	302.764.7635	☐
	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.	Township Engineer	James Hatfield, PE	302.764.7635	☐

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.	Township Engineer	James Hatfield, PE	302.764.7635	☐
	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.	Township Engineer	James Hatfield, PE	302.764.7635	☐
	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.	Township Engineer	James Hatfield, PE	302.764.7635	☐
#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.	Township Engineer	James Hatfield, PE	302.764.7635	☐
	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.	Township Engineer	James Hatfield, PE	302.764.7635	☐
	3	Enact, implement, and enforce an ordinance to require the implementation of erosion and sediment control BMPs, as well as sanctions to ensure compliance.	Township Engineer	James Hatfield, PE	302.764.7635	☐
	4	Review Erosion and Sediment (E&S) control plans to ensure that such plans adequately consider water quality impacts and meet regulatory requirements.				☐
	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.				☐
	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.				☐
	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.				☐

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.				☐
#5, Post-Construction Stormwater Management in New Development and Redevelopment	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.	Township Engineer	James Hatfield, PE	302.764.7635	☐
	2	Develop and implement measures to encourage and expand the use of Low Impact Development (LID) in new development and redevelopment.	Township Engineer	James Hatfield, PE	302.764.7635	☐
	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.	Township Engineer	James Hatfield, PE	302.764.7635	☐
	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.				☐
	5	Inspect all qualifying development or redevelopment projects to ensure proper installation of the approved structural PCSM BMPs.				☐
	6	Develop a written program that describes how the permittee shall implement and enforce all required components of this MCM.				☐
#6 – Pollution Prevention / Good Housekeeping	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.	Chief of Police	Thomas Nelling	610.793.3333	☐
	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.	Chief of Police	Thomas Nelling	610.793.3333	☐
	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.	Chief of Police	Thomas Nelling	610.793.3333	☐

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:	**11/4/2013**	☐ 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
NPDES	SEWPA0053449	11/30/2011	PADEP
WQM	1514401	8/5/2014	PADEP

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: Permit No.:

Brief Description of Non-Compliance:

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 am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

John L. Conklin	Chairman - Board of Supervisors
Name (type or print legibly)	**Official Title**
Signature	**Date Signed**

TOTAL MAXIMUM DAILY LOAD PLAN
AND
POLLUTANT REDUCTION PLANS

For

BIRMINGHAM TOWNSHIP
CHESTER COUNTY
SEPTEMBER 16, 2017

Prepared By: VanDemark & Lynch, Inc.
4305 Miller Road
P.O. Box 2047
Wilmington, DE 19899
(302) 764-7635

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Total Maximum Daily Load Plan and Pollutant Reduction Plan

Birmingham Township

Chester County, Pennsylvania

Renewal of Municipal Separate Storm Sewer Permit #PAG-130047

as an Individual Permit

September 16, 2017

Executive Summary

The regulated portion of Birmingham Township consists of portions of two watersheds draining into the Brandywine Creek, a watershed draining to the Brandywine Creek itself, and a watershed draining to the Chester Creek. The northern half (and a small part of the east end) of the Township drains to Radley Run (an impaired stream). This area is referred to as watershed B15 in this report, consistent with the terminology of the TMDL document. The southern and western parts of the Township drain to Renwick, Wylie, and/or Brinton Runs (all of which are impaired streams) and this area is referred to as watershed B16 in this report. Both of these watersheds drain to the Brandywine Creek. A small area in the southwest corner of the Township drains to Chester Creek, which does not have an approved sediment or nutrient TMDL, but is listed as impaired. The Chester Creek watershed does not drain to the Christina River, and is therefore not represented in the TMDL document. The TMDL document requires a 58% reduction in sediment discharged to TMDL watershed B15 over the long term (10% reduction in this 5 year permit cycle). The TMDL document requires no reduction in TMDL watershed B16. Per the requirements of the MS4 permit, Birmingham is required to achieve a 10% reduction in sediment discharged to impaired streams for which no TMDL has been approved, or to impaired streams where no load allocation is assigned to the Township.

The TMDL document attributed pollution loadings to municipalities based solely on the municipal land area within each watershed. No attempt was made to determine what areas actually drain through municipally owned facilities, or what effect any stormwater management practices present in the municipality might have. In accordance with guidance from DEP, we re-calculated the existing pollutant loads, based on areas tributary to municipally owned outfalls. This revised loading data will be the starting point from which the required pollutant reduction percentages will be calculated.

Birmingham is proposing to construct Best Management Practices (BMPs) to treat stormwater runoff and remove the required amounts of pollutants. Locations and types of BMPs have been selected, but design and engineering for these facilities has not been started. Progress on construction, and calculations indicating progress towards the goals identified in the MS4 permit, will be included in annual reports.

This report outlines Birmingham Township's plans to address the pollutant reduction requirements of the Municipal Separate Storm Sewer System permit. This report is broken into two sections:

Section 1 - Total Maximum Daily Load (TMDL) Plan

Section 1 lays out plans for addressing the pollutant reductions required by a document titled *Total Maximum Daily Loads for Bacteria and Sediment in the Christina River Basin, Pennsylvania, Delaware, and Maryland*, published in September 2006 by the Environmental Protection Agency (TMDL Document).

In summary, Birmingham plans to retrofit three stormwater facilities in existing subdivision open space in watershed B15 to achieve a reduction of 10% or more in pollutants discharged from the MS4 system in this watershed.

Section 2 – Pollutant Reduction Plans (PRP)

Section 2 lays out plans for addressing pollutant reductions required by the MS4 permit for waters in which no TMDL has been developed (Chester Creek), or where no load allocation is assigned to the Township in the TMDL document (B16).

Section 2a – Chester Creek PRP

For the Chester Creek watershed, Birmingham Township plans to retrofit an existing stormwater facility on a commercial parcel to achieve a reduction of 10% or more in pollutants discharged from the MS4 system in this watershed. Alternately, it is possible that Birmingham may decide to enter a cooperative effort with another Township to address the Chester Creek PRP. This option is in the informal discussion stage. If it becomes apparent that the Township will benefit from pursing this option, a revised PRP will be submitted with details.

Section 2b – TMDL Watershed B16 PRP

For watershed B16, Birmingham plans to retrofit three existing stormwater facilities in subdivision open space to achieve a reduction of 10% or more in pollutants discharged from the MS4 system in this watershed.

Section 1 - TMDL Plan : Watershed B15

A. PUBLIC PARTICIPATION

The public was given opportunity to comment on and contribute to this plan. Special Meetings of the Board of Supervisors were advertised as required, and held on March 22 and May 9 2017, to discuss the ramifications of this new MS4 permit.

The Township Engineer presented a draft TMDL/PRP Plan to the public and Board of Supervisors at a public meeting on July 10, 2017. The draft Plan was also posted on the Township website. This date serves as the starting point of the 30 day comment period.

written comments were received by the Township during the comment period. Each was considered and responded to.

Documentation of the above, including a list of comments received and the Township's responses, can be found in Appendix 1-A.

B. MAP

The existing MCM 3 map from prior permit cycles had been updated to illustrate areas tributary to each municipally owned outfall. A copy of the map is included in the rear pocket of this report.

C. POLLUTANTS OF CONCERN

The only pollutant identified in watershed B15 (for Birmingham Township) in the TMDL document is sediment.

D. EXISTING LOAD FOR POLLUTANTS OF CONCERN

Section 2.1.3 of the TMDL document notes that; "The delineation of the stormwater collection system contributing areas within each municipality has not been completed at the present time. Therefore it is not possible to assign a WLA specific to the storm sewer collection areas within each MS4 municipality. Instead the TMDL will be presented as a WLA for the entire land area of the township, borough, or county. In the future, when the storm sewer collection systems have been delineated, it is anticipated that the State's storm water program will revise the WLA into the appropriate WLA and LA as part of storm water permit issuance. Note that the overall reductions in the TMDL will not change. "

The TMDL made no attempt to determine the amount of sediment actually discharged from municipal facilities; rather it assumed that the Township was responsible for all sediment from

all land area within the Township. We have defined the areas actually discharging from municipal facilities, and applied unit loading rates derived from the TMDL document to these areas, to establish the existing load from municipal facilities.

The procedure used to calculate existing pollutant loading is summarized below. Printouts of the spreadsheet used are included in Appendix 1-B. Since the spreadsheets are difficult to digest on their own, we have also provided a sample calculating illustrating the function of the spreadsheets in Appendix 1-B, to facilitate DEP review.

- A USGS quad map was overlaid on a Township outfall map, and the areas tributary to each outfall were delineated.
- The land use for each tributary area was determined, based on Zoning districts. In Birmingham, all of the tributary areas happen to be residential.
- Unit loadings derived from Appendix C in the TMDL Document were applied to the delineated drainage areas. The unit loadings were calculated by dividing the total mass of pollutant for each land use in Table C-5b by the area of the land use in Table C-1. For example, Table C-5b indicates that 37.30 tons of sediment per year come from residential areas in Birmingham in watershed B15. Table C-1 indicates that there are 546.14 acres of residential land in watershed B15 in Birmingham. The residential area unit loading is therefore 37.30 tons/546.14 acres = 0.0678 tons per acre.

Birmingham is not considering any load reductions from existing BMPs.

E. Wasteload Allocations

The tables in Appendix C of the TMDL Document give the following data for Watershed B15 in Birmingham Township:

	Residential (Tons/year)	Agricultural (Tons/yr)	Open (Tons/yr)	Forested (Tons/yr	Wetland (Tons/yr)	Urban (Tons/yr)	Sub Total (Tons /yr)	Total (Tons/yr)
Sediment Baseline Load	37.3	253.09	7.99	3.11	0	9.32	310.81	310.81
Sediment MS4 Reduction	58.06%	58.78%	58.06%	58.06%	0.00%	0.00%	58.06%	58.06%
Sediment MS4 Load Allocation	15.64	104.33	3.35	3.11	0	3.91	130.35	130.35
Sediment Waste Load Allocation*	21.66	148.76	4.64	0	0	5.41	180.46	180.46

*Calculated from data above

As noted in part D above, these allocations bear no relation to the amount of sediment actually discharged from municipal facilities. Using the procedure detailed above, we calculate the existing sediment load from municipally owned facilities in watershed B15 to be 64,288 pounds (32.14 tons) per year. Per DEP, we are to focus on the % reduction required, rather than the tonnage reported in the TMDL document. In the long term, the Township's obligation is to reduce its sediment contribution to watershed B15 by 58.06% . DEP's goal for this permit cycle is a minimum 10% reduction in the calculated existing load.

F. Analysis of TMDL Objectives

Watershed B15

1. Permit Cycle Reduction: 10% existing load (0.10 x 64,288 = 6,428 pounds)
2. Long Term Reduction: 58.06% existing load (0.5806 x 64,288 = 37,325 pounds)

Various compliance scenarios were analyzed to determine if the ultimate TMDL goal could be achieved in a single permit cycle. The analysis indicated that approach would be cost prohibitive. We have therefore set the goal of removing 10% of the existing load in this permit cycle, in accordance with the guidance given in the TMDL and PRP plan instructions.

G. Select BMPs to Achieve the Minimum Required Reductions in Pollutant Load

After analyzing multiple options to comply with the permit requirements, it was determined that retrofitting existing stormwater management facilities would be the most cost effective way for the Township to achieve the goals of the permit. For this permit cycle, we are focusing on retrofits to existing stormwater management basins located in open space in residential subdivisions.

The calculated effectiveness of the proposed BMPs, and therefore the calculated percentage reductions in pollutants achieved, are based on a document titled *Recommendations of the Expert Panel to define removal Rates for Urban Stormwater Retrofit Projects*, prepared by the Chesapeake Stormwater Network.

All proposed retrofits are classified as "Runoff Reduction" measures. The calculations indicate that the proposed retrofits will result in a 10.62% reduction in sediment discharged from the MS4 system in watershed B15.

H. Funding Mechanism

Cost estimates for the current plan suggest that the proposed improvements can be constructed using money out of the General Fund.

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

Negotiations with the effected property owners are not complete. Presently the property owners are responsible for O&M. We anticipate that after the basin retrofits are implemented there may be some sharing of the O&M responsibilities between the property owners and the Township. Final delineation of these responsibilities will be agreed to during the design phase and information will be provided in subsequent reports.

Section 2 - Pollutant Reduction Plans : Chester Creek Watershed and TMDL Watershed B16

Section 2a – Chester Creek PRP

A. PUBLIC PARTICIPATION

The public was given opportunity to comment on and contribute to this plan. Special Meetings of the Board of Supervisors were advertised as required, and held on March 22 and May 9 2017, to discuss the ramifications of this new MS4 permit.

The Township Engineer presented a draft TMDL/PRP Plan to the public and Board of Supervisors at a public meeting on July 10, 2017. The draft Plan was also posted on the Township website. This date serves as the starting point of the 30 day comment period.

written comments were received by the Township during the comment period. Each was considered and responded to.

Documentation of the above, including a list of comments received and the Township's responses, can be found in Appendix 1-A.

B. MAP

The existing MCM 3 map from prior permit cycles had been updated to illustrate areas tributary to each municipally owned outfall. A copy of the map is included in the rear pocket of this report.

C. POLLUTANTS OF CONCERN

The DEP's GIS site identifies the portion of Chester Creek in Birmingham Township as impaired by sediment.

D. EXISTING LOAD FOR POLLUTANTS OF CONCERN

The procedure used to calculate existing pollutant loading is summarized below. Printouts of the spreadsheet used are included in Appendix 1-B.

- A USGS quad map was overlaid on a Township outfall map, and the areas tributary to each outfall were delineated.
- The land use for each tributary area was determined, based on Zoning districts.
- The unit loading rates given in Attachment B of the DEP's PRP Instructions (Document #3800-PM-BWC0100k, dated 5/2016) were applied to the delineated drainage areas to generate the existing load, which is calculated to be 4,658 pounds per year

E. Select BMPs to Achieve the Minimum Required Reductions in Pollutant Load

The portion of Chester Creek within Birmingham is impaired for sediment. Per DEP direction we are to implement a Pollution Reduction Plan (PRP) in accordance with Appendix E of the PAG-13 Authorization to Discharge (DEP document #3800-PM-BCW0100d dated 5/2016) which requires a 10% reduction in sediment discharged from the MS4.

We plan to construct a runoff reduction retrofit practice in an existing stormwater management facility on a commercial property. Our calculations indicate that this will result in a 14% reduction in sediment discharged from Birmingham's MS4 system into the Chester Creek watershed. Detailed calculations are in Appendix 1-B

F. Identify Funding Mechanism

Cost estimates based on the current plan indicate that the proposed retrofit can be constructed using money out of the General Fund.

G. Identify Responsible Parties for Operation and Maintenance

Negotiations with the effected property owners are not complete. Presently the property owners are responsible for O&M. We anticipate that after the basin retrofits are implemented there may be some sharing of the O&M responsibilities between the property owners and the Township. Final delineation of these responsibilities will be agreed to during the design phase and information will be provided in subsequent reports.

Section 2b – Watershed B16 PRP

A. PUBLIC PARTICIPATION

The public was given opportunity to comment on and contribute to this plan. Special Meetings of the Board of Supervisors were advertised as required, and held on March 22 and May 9 2017, to discuss the ramifications of this new MS4 permit.

The Township Engineer presented a draft TMDL/PRP Plan to the public and Board of Supervisors at a public meeting on July 10, 2017. The draft Plan was also posted on the Township website. This date serves as the starting point of the 30 day comment period.

written comments were received by the Township during the comment period. Each was considered and responded to.

Documentation of the above, including a list of comments received and the Township's responses, can be found in Appendix 1-A.

B. MAP

The existing MCM 3 map from prior permit cycles had been updated to illustrate areas tributary to each municipally owned outfall. A copy of the map is included in the rear pocket of this report.

C. POLLUTANTS OF CONCERN

The DEP's GIS site identifies Birmingham's portion of watershed B16 to be impaired by sediment.

D. EXISTING LOAD FOR POLLUTANTS OF CONCERN

The procedure used to calculate existing pollutant loading is summarized below. Printouts of the spreadsheet used are included in Appendix 1-B.

- A USGS quad map was overlaid on a Township outfall map, and the areas tributary to each outfall were delineated.
- The land use for each tributary area was determined, based on Zoning districts. In Birmingham, all of the tributary areas happen to be residential.
- The unit loading rates given in Attachment B of the DEP's PRP Instructions (Document #3800-PM-BWC0100k, dated 5/2016) were applied to the delineated drainage areas to generate the existing load, which is calculated to be 85,903 pounds per year.

E. Select BMPs to Achieve the Minimum Required Reductions in Pollutant Load

The portion of watershed B16 within Birmingham is impaired for sediment. Per DEP direction we are to implement a Pollution Reduction Plan (PRP) in accordance with Appendix E of the PAG-13 Authorization to Discharge (DEP document #3800-PM-BCW0100d dated 5/2016) which requires a 10% reduction in sediment discharged from the MS4.

We plan to construct three runoff reduction retrofit practices in existing stormwater management facilities in residential subdivisions. Our calculations indicate that this will result in a 14% reduction in sediment discharged from Birmingham's MS4 system into watershed B16. Detailed calculations are in Appendix 1-**B**

F. Identify Funding Mechanism

Cost estimates based on the current plan indicate that the proposed retrofit can be constructed using money out of the General Fund.

G. Identify Responsible Parties for Operation and Maintenance

Negotiations with the effected property owners are not complete. Presently the property owners are responsible for O&M. We anticipate that after the basin retrofits are implemented there may be some sharing of the O&M responsibilities between the property owners and the Township. Final delineation of these responsibilities will be agreed to during the design phase and information will be provided in subsequent reports.

APPENDIX 1-A

PUBLIC COMMENTS AND REPSPONSES

21ST CENTURY media

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AFFIDAVIT OF PUBLICATION

307 Derstine Avenue • Lansdale, PA 19446

BIRMINGHAM TOWNSHIP
1040 WEST STREET ROAD
WEST CHESTER, PA 19382
Attention:

STATE OF PENNSYLVANIA,
COUNTY OF MONTGOMERY

The undersigned Kathy Yurkanin, being duly sworn the he/she is the principal clerk of Daily Local News, Daily Local News 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:

BIRMINGHAM TOWNSHIP

Published in the following edition(s):

Daily Local News	03/10/17
Daily Local News Digital	03/10/17

A Special Public Meeting of the Board of Supervisors of Birmingham Township will be held Wednesday March 22, 2017, at 4:30 pm at the Township Municipal Building, 1040 West Street Road, West Chester, PA 19382. The purpose of the meeting is to discuss the Municipal Separate Storm Sewer program, and the Township's pending permit renewal application. Anyone needing special accommodations, as provided for in the Americans with Disabilities Act of 1990, should contact the Township Office at 610-793-2600
dln. 3/10 - 1a.

Sworn to the subscribed before me this 3/14/2017.

Maureen Schmid

Notary Public, State of Pennsylvania
Acting in County of Montgomery

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
MAUREEN SCHMID, Notary Public
Lansdale Boro., Montgomery County
My Commission Expires March 31, 2021

Advertisement Information

Client Id: 884434 **Ad Id:** 1278920 **PO:** MS4 Work Session **Sales Person:** 093304

APPENDIX 1-B

SAMPLE CALCULATION AND SPREADSHEET PRINTOUTS

VANDEMARK & LYNCH, INC.
ENGINEERS • PLANNERS • SURVEYORS
4305 Miller Road
Wilmington, DE 19802-1901
(302) 764-7635 / Fax (302) 764-4170

Job No. 19190.8 Job Name BT MS4/TMDL Date 6/5/17
Temp _____ Location _____ Crew _____
Weather _____ Description TMDL Sample Calcs JAC

Sample Calculations to Illustrate Spreadsheet function

Outfall #91 is in Watershed B15 and the R2 residential zoning district

Total Drainage area to #91 = 37.47 Acres per delineation based on USGS quad map

Maximum permitted impervious in R2 District is 20%.

∴ Impervious Area + Pervious Area = Total Area

(0.2)(37.47) + (0.8)(37.47) = 37.47

7.49 Ac + 29.97 Ac = 37.47

per TMDL document 546.14 acres of residential land in Birmingham (Table C.1) in B15

Those 546.14 acres generate 37.3 tons of sediment per year (Table C-5b)

So a given acre of residential generates

$$\frac{37.3 \text{ tons}}{546.14 \text{ acres}} = 0.068 \text{ tons/acre} = 136.59 \text{ \#/acre}$$

∴ $136.59 \frac{\#}{Ac}(37.47 Ac) = 5118.02 \#/yr$ @ outfall #91

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4305 Miller Road
Wilmington, DE 19802-1901
(302) 764-7635 / Fax (302) 764-4170

Job No. _____ Job Name _____ Date _____
Temp _____ Location _____ Crew _____
Weather _____ Description _____

Outfall #91 is a discharge from a 1990's era Dry Detention pond in the Birmingham Hunt subdivision

It is assumed to provide no water quality treatment per pg 17 of the Chesapeake Bay Panel urban retrofit recommendations

We plan to modify the outlet structure to retain 14,000 cubic feet of runoff for infiltration

Per the Bay Panel Retrofit equation

$$\frac{(RS)(12)}{(I_A)}$$

$\frac{14000}{43560} = RS = \text{Storage in acre feet} = 0.32$

$I_A = \text{Impervious Acres} = 7.49$

$$\frac{(.32)(12)}{(7.49)} = 0.512'' / \text{impervious acre}$$

which, per the retrofit curve, equates to a 55% reduction in sediment discharge

The retrofit will therefore remove

$(0.55)(5118) = 2814\#$ of sediment

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ENGINEERS • PLANNERS • SURVEYORS
4305 Miller Road
Wilmington, DE 19802-1901
(302) 764-7635 / Fax (302) 764-4170

Job No. _____ Job Name _____ Date _____
Temp _____ Location _____ Crew _____
Weather _____ Description _____

Using the previously detailed process we calculate the total MS4 load to BIS to be 64288 #/year, 5,118 # of which come from outfall #91. From last page we are removing 55% of that 5,118 #, or 2814 # of removal

Long term goal is 58% of 64288 # = 37287 # which is cost prohibative. Goal for permit cycle is 10% of existing load or (0.1)(64288#) = 6428 #

The retrofits at outfall #91 remove 2814 # or

$\frac{2814}{6428}$ = 43% of our permit cycle goal in BIS

The remaining reduction in BIS are from similar retrofits at outfall #s 11 and 89

Outfall #	Watershed	Zoning	Land Use	Total Area (ac)	% Impervious	Pervious Area (ac)	Impervious Area (ac)
1	B15	R1	Residential	5.33	0.12	4.69	0.64
2	B15	R1	Residential	4.41	0.12	3.88	0.53
3	B15	RA	Residential	12.77	0.12	11.24	1.53
4	B15	R1	Residential	1.07	0.12	0.94	0.13
5	B15	R1	Residential	1.14	0.12	1.01	0.14
6	B15	R1	Residential	5.84	0.12	5.14	0.70
7	B15	R1	Residential	4.00	0.12	3.52	0.48
8	B15	R1	Residential	0.93	0.12	0.82	0.11
9	B15	R1	Residential	1.02	0.12	0.90	0.12
10	B15	R1	Residential	3.05	0.12	2.68	0.37
11	B15	R1	Residential	29.84	0.12	26.26	3.58
12	B15	R1	Residential	1.88	0.12	1.65	0.23
13	B15	R1	Residential	3.81	0.12	3.35	0.46
14	B15	R1	Residential	0.57	0.12	0.50	0.07
15	B15	R1	Residential	4.57	0.12	4.02	0.55
16	B15	R1	Residential	1.98	0.12	1.74	0.24
17	B15	R1	Residential	2.21	0.12	1.94	0.27
18	B15	R1	Residential	7.68	0.12	6.76	0.92
19	B15	R1	Residential	3.09	0.12	2.72	0.37
20	B15	R1	Residential	1.08	0.12	0.95	0.13
21	B15	R1	Residential	0.63	0.12	0.56	0.08
22	B15	R1	Residential	1.02	0.12	0.90	0.12
23	B15	R1	Residential	1.44	0.12	1.27	0.17
24	B15	R1	Residential	0.36	0.12	0.32	0.04
25	B15	R1	Residential	36.70	0.12	32.30	4.40
26	B15	R1	Residential	10.84	0.12	9.54	1.30
27	B15	R1	Residential	7.70	0.12	6.77	0.92
28	B15	R1	Residential	20.00	0.12	17.60	2.40
29	B15	RA	Residential	11.52	0.12	10.14	1.38
30	B15	RA	Residential	17.30	0.12	15.23	2.08
31	B15	RA	Residential	10.12	0.12	8.90	1.21
32	B15	RA	Residential	4.65	0.12	4.09	0.56
33	B15	RA	Residential	2.08	0.12	1.83	0.25
34	B15	RA	Residential	7.11	0.12	6.26	0.85
35	B15	RA	Residential	22.83	0.12	20.09	2.74
36	B15		#N/A	0.00	#N/A	#N/A	#N/A
37	B15		#N/A	0.00	#N/A	#N/A	#N/A
38	B15		#N/A	0.00	#N/A	#N/A	#N/A
39	B15	R1	Residential	11.75	0.12	10.34	1.41
40	B15	R1	Residential	2.79	0.12	2.45	0.33
41	B15	R1	Residential	5.64	0.12	4.96	0.68
42	B15	R1	Residential	12.63	0.12	11.11	1.52
43	B15	R1	Residential	4.03	0.12	3.55	0.48
44	B15	R1	Residential	5.36	0.12	4.71	0.64
45	B15	R1	Residential	0.83	0.12	0.73	0.10
46	B15	R1	Residential	2.38	0.12	2.10	0.29
47			#N/A	0.00	#N/A	#N/A	#N/A
48	B15	R1	Residential	3.45	0.12	3.04	0.41
49	B15	R1	Residential	4.36	0.12	3.84	0.52
50	B15	R1	Residential	5.52	0.12	4.86	0.66
51	B15	R1	Residential	2.05	0.12	1.80	0.25
52	B15	R1	Residential	1.35	0.12	1.19	0.16
53	B15	R1	Residential	0.46	0.12	0.40	0.05
54	B15	R1	Residential	5.26	0.12	4.62	0.63
55	B15	RA	Residential	3.15	0.12	2.77	0.38
56			#N/A	0.00	#N/A	#N/A	#N/A
57			#N/A	0.00	#N/A	#N/A	#N/A

Outfall #	Watershed	Zoning	Land Use	Total Area (ac)	% Impervious	Pervious Area (ac)	Impervious Area (ac)
58			#N/A	0.00	#N/A	#N/A	#N/A
59			#N/A	0.00	#N/A	#N/A	#N/A
60			#N/A	0.00	#N/A	#N/A	#N/A
61	B16	RA	Residential	5.03	0.12	4.43	0.60
62	B16	RA	Residential	11.09	0.12	9.76	1.33
63	B16	RA	Residential	0.42	0.12	0.37	0.05
64	B16	RA	Residential	1.13	0.12	0.99	0.14
65	B16	RA	Residential	1.70	0.12	1.50	0.20
66	B16	RA	Residential	1.42	0.12	1.25	0.17
67	B16	RA	Residential	0.64	0.12	0.57	0.08
68	B16	RA	Residential	5.26	0.12	4.63	0.63
69	B16	RA	Residential	10.43	0.12	9.18	1.25
70	B16	R1	Residential	9.94	0.12	8.75	1.19
71	B16	R2	Residential	7.66	0.2	6.13	1.53
72			#N/A	0.00	#N/A	#N/A	#N/A
73	B16	R1	Residential	7.90	0.12	6.95	0.95
74			#N/A	0.00	#N/A	#N/A	#N/A
75	B16	A-RT	Residential	19.07	0.12	16.78	2.29
76	B16	R1	Residential	10.91	0.12	9.60	1.31
77			#N/A	0.00	#N/A	#N/A	#N/A
78	B16	RA	Residential	1.56	0.12	1.37	0.19
79	B16	A-RT	Residential	15.84	0.12	13.94	1.90
80	B16	A-RT	Residential	19.41	0.12	17.08	2.33
81	B16	A-RT	Residential	7.69	0.12	6.77	0.92
82	B16	A-RT	Residential	4.12	0.12	3.63	0.49
83	B16	R2	Residential	2.77	0.2	2.21	0.55
84	B15	R2	Residential	50.43	0.2	40.34	10.09
85	B16	R2	Residential	6.18	0.2	4.94	1.24
86a	B15	R2	Residential	24.06	0.2	19.25	4.81
86b	B15	R2	Residential	1.22	0.2		
86c	B15	R2	Residential	5.63	0.2		
86d	B15	R2	Residential	2.27	0.2		
87			#N/A	0.00	#N/A	#N/A	#N/A
88	B15	R2	Residential	3.64	0.2	2.91	0.73
89	B15	R2	Residential	13.47	0.2	10.78	2.69
90	B15	R2	Residential	10.46	0.2	8.37	2.09
91	B15	R2	Residential	37.47	0.2	29.98	7.49
92	B15	R2	Residential	0.43	0.2	0.34	0.09
93	B15	C-2A	Commercial	4.61	0.5	2.31	2.31
94	B15	C-2A	Commercial	4.19	0.5	2.10	2.10
95	B15	C-2A	Commercial	2.00	0.5	1.00	1.00
96	Chester Creek	C-H	Commercial	5.51	0.5	2.76	2.76
97	B16	R1	Residential	1.83	0.12	1.61	0.22
98	B16	R1	Residential	3.19	0.12	2.80	0.38
99	B16	R1	Residential	0.81	0.12	0.71	0.10
100	B16	R1	Residential	2.12	0.12	1.87	0.25
101	B16	R1	Residential	2.08	0.12	1.83	0.25
102	B16	R1	Residential	21.73	0.12	19.12	2.61
103			#N/A	0.00	#N/A	#N/A	#N/A
104			#N/A	0.00	#N/A	#N/A	#N/A
105			#N/A	0.00	#N/A	#N/A	#N/A
106			#N/A	0.00	#N/A	#N/A	#N/A
107	B16	R1	Residential	11.84	0.12	10.42	1.42
108	B16	R1	Residential	7.31	0.12	6.43	0.88
109	B16	R1	Residential	7.62	0.12	6.70	0.91
110	B16	R1	Residential	12.96	0.12	11.40	1.55
111	B16	R1	Residential	12.94	0.12	11.39	1.55

Outfall #	Watershed	Zoning	Land Use	Total Area (ac)	% Impervious	Pervious Area (ac)	Impervious Area (ac)
112	B16	R1	Residential	10.37	0.12	9.13	1.24
113			#N/A	0.00	#N/A	#N/A	#N/A

Per Attachment B of 3800-PM-BCW0100k dated 5/2016			
Chester County			
	Impervious Developed	Pervious Developed	
Sed	1504.78	185.12	lbs/ac/yr
N	21.15	14.09	lbs/ac/yr
Phos	1.46	0.36	lbs/ac/yr

Outfall Type
Outfall
Obs. Point

BMP Type
Runoff Reduction
Stormwater Treatment

Presumtive Lookup Per 9/2016 DEP guidance		
% Sed redux	% P Redux	% N redux
0	0	0
1%	0.50%	0.30%
2%	1.00%	0.60%
3%	1.50%	0.90%
4%	2.00%	1.20%
5%	2.50%	1.50%
6%	3.00%	1.80%
7%	3.50%	2.10%
8%	4.00%	2.40%
9%	4.50%	2.70%
10%	5.00%	3.00%
100%	5.00%	3.00%

			%Redux Req'd		
	BT Watersheds	sed	Phos	N	
	B15		58.06%	No Allocation	No Allocation
No TMDL - PRP	B16		10.00%	No Allocation	No Allocation
No TMDL - PRP	Chester Creek		10.00%	No Allocation	No Allocation

Target Reduction%
10.00%

Yes
No

BT ZONING	Lot Size	% Impervious			
RA	3.5		12.00%	Residential	1
A-RT	4		12.00%	Residential	2
R1	2		12.00%	Residential	3
R2	1		20.00%	Residential	4
E1			40.00%	Institutional	5
C1			80.00%	Commercial 2	6
C2			80.00%	Commercial 1	7
C3			80.00%	Commercial	8
C-H			50.00%	Commercial	9
C-2A			50.00%	Commercial	10
OpenSpace			0.00%	Open	11

Per Chesapeake Bay Retrofit Expert Panel			
Stormwater Treatment		**Runoff Reduction**	
Retrofit Sediment Lookup		Retrofit Sediment Lookup	
Inches Captured Per Impervious Acre	%Sed Removal	Inches Captured Per Impervious Acre	%Sed Removal
0	0	0	0
0.015625	0.0021875	0.015625	0.0025
0.03125	0.004375	0.03125	0.005
0.0625	0.00875	0.0625	0.01
0.125	0.0175	0.125	0.02
0.25	0.035	0.25	0.04
0.5	0.07	0.5	0.08
0.1	0.14	0.1	0.16
0.2	0.27	0.2	0.29
0.3	0.38	0.3	0.4
0.4	0.44	0.4	0.49
0.5	0.52	0.5	0.55
0.6	0.565	0.6	0.615
0.7	0.618	0.7	0.64
0.8	0.668	0.8	0.695
0.9	0.688	0.9	0.725
1	0.698	1	0.75
1.1	0.715	1.1	0.765
1.2	0.73	1.2	0.78
1.3	0.745	1.3	0.795
1.4	0.75	1.4	0.805
1.5	0.76	1.5	0.815
1.55	0.764	1.55	0.8175
1.6	0.768	1.6	0.82
1.7	0.77	1.7	0.827
1.8	0.778	1.8	0.832
1.9	0.782	1.9	0.837
2	0.784	2	0.839
2.1	0.785	2.1	0.84
2.2	0.786	2.2	0.841
2.3	0.787	2.3	0.842
2.4	0.788	2.4	0.845
2.5	0.79	2.5	0.847
100	0.79	100	0.79

Retrofit Phos Lookup		Retrofit Phos Lookup	
Inches Captured Per Impervious Acre	%Phos Removal	Inches Captured Per Impervious Acre	%Phos Removal
0	0	0	0
0.1	0.11	0.1	0.147
0.2	0.212	0.2	0.27
0.3	0.295	0.3	0.375
0.4	0.358	0.4	0.455
0.5	0.41	0.5	0.525
0.6	0.45	0.6	0.575
0.7	0.485	0.7	0.62
0.8	0.51	0.8	0.65
0.9	0.532	0.9	0.678
1	0.545	1	0.695
1.1	0.562	1.1	0.715
1.2	0.575	1.2	0.731
1.3	0.582	1.3	0.742
1.4	0.59	1.4	0.751
1.5	0.598	1.5	0.75
1.6	0.605	1.6	0.768
1.7	0.608	1.7	0.772
1.8	0.61	1.8	0.778
1.9	0.612	1.9	0.78
2	0.615	2	0.782
2.1	0.618	2.1	0.784
2.2	0.619	2.2	0.785
2.3	0.62	2.3	0.787
2.4	0.621	2.4	0.788
2.5	0.622	2.5	0.79
100	0.622	100	0.622

Retrofit N Lookup		Retrofit N Lookup	
Inches Captured Per Impervious Acre	% N Removal	Inches Captured Per Impervious Acre	%N Removal
0	0	0	0
0.1	0.07	0.1	0.12
0.2	0.135	0.2	0.23
0.3	0.188	0.3	0.32
0.4	0.225	0.4	0.39
0.5	0.26	0.5	0.445
0.6	0.29	0.6	0.492
0.7	0.308	0.7	0.528
0.8	0.325	0.8	0.55

Zoning	Assumed avg house footprint
RA	3000
A-RT	
R1	2000
R2	

0.9	0.34	0.9	0.58
1	0.35	1	0.595
1.1	0.36	1.1	0.61
1.2	0.365	1.2	0.625
1.3	0.37	1.3	0.632
1.4	0.379	1.4	0.642
1.5	0.38	1.5	0.65
1.6	0.382	1.6	0.656
1.7	0.388	1.7	0.662
1.8	0.39	1.8	0.665
1.9	0.391	1.9	0.67
2	0.392	2	0.672
2.1	0.393	2.1	0.673
2.2	0.394	2.2	0.675
2.3	0.395	2.3	0.677
2.4	0.397	2.4	0.678
2.5	0.398	2.5	0.68
100	0.398	100	0.68

TMDL Document Data
B15

	Area (ac)	Load (t/yr)	Unit Acre Load (t/yr)	Unit Acre Load (#/yr)
Residential	546.14	37.3	0.068297506	136.5950123
Agriculture	741.19	253.09	0.341464402	682.9288037
Open Spacew	117.03	7.99	0.068273092	136.5461847
Forest	136.54	3.11	0.022777208	45.55441629
Water	19.51	0	0	0
Urban	136.54	9.32	0.068258386	136.5167716

	Total Sed Load	Total N Load		Total P load				
		calc		calc				
b15	64287.68053	7163.384673		249.2225927				
b16	85902.62712	3668.85175		121.9969212				
chester creek	4658.41729	97.14339624		5.017053949				
						Current BMPs		
Outfall ID #		Plan Type	Land Use	Drainage Area	Pervious Dev. Area	Total Sed Load	Total calc P Load	Total calc n Load
1	B15	TMDL	Residential	232190.00	4.69	728.10	2.62	79.62
2	B15	TMDL	Residential	192267.00	3.88	602.91	2.17	65.93
3	B15	TMDL	Residential	556281.00	11.24	1744.38	6.28	190.75
4	B15	TMDL	Residential	46561.00	0.94	146.01	0.53	15.97
5	B15	TMDL	Residential	49829.00	1.01	156.25	0.56	17.09
6	B15	TMDL	Residential	254221.00	5.14	797.18	2.87	87.18
7	B15	TMDL	Residential	174141.00	3.52	546.07	1.97	59.71
8	B15	TMDL	Residential	40555.00	0.82	127.17	0.46	13.91
9	B15	TMDL	Residential	44492.00	0.90	139.52	0.50	15.26
10	B15	TMDL	Residential	132731.00	2.68	416.22	1.50	45.51
11	B15	TMDL	Residential	1299701.00	26.26	4075.59	14.68	445.68
12	B15	TMDL	Residential	81861.00	1.65	256.70	0.92	28.07
13	B15	TMDL	Residential	165914.00	3.35	520.27	1.87	56.89
14	B15	TMDL	Residential	24652.00	0.50	77.30	0.28	8.45
15	B15	TMDL	Residential	198907.00	4.02	623.73	2.25	68.21
16	B15	TMDL	Residential	86158.00	1.74	270.17	0.97	29.54
17	B15	TMDL	Residential	96262.00	1.94	301.86	1.09	33.01
18	B15	TMDL	Residential	334734.00	6.76	1049.66	3.78	114.78
19	B15	TMDL	Residential	134525.00	2.72	421.84	1.52	46.13
20	B15	TMDL	Residential	47071.00	0.95	147.60	0.53	16.14
21	B15	TMDL	Residential	27489.00	0.56	86.20	0.31	9.43
22	B15	TMDL	Residential	44520.00	0.90	139.61	0.50	15.27
23	B15	TMDL	Residential	62833.00	1.27	197.03	0.71	21.55
24	B15	TMDL	Residential	15849.00	0.32	49.70	0.18	5.43
25	B15	TMDL	Residential	1598769.00	32.30	5013.40	18.06	548.24
26	B15	TMDL	Residential	472029.00	9.54	1480.18	5.33	161.86
27	B15	TMDL	Residential	335291.00	6.77	1051.40	3.79	114.97
28	B15	TMDL	Residential	871046.00	17.60	2731.42	9.84	298.69
29	B15	TMDL	Residential	501947.00	10.14	1574.00	5.67	172.12
30	B15	TMDL	Residential	753685.00	15.23	2363.40	8.51	258.45
31	B15	TMDL	Residential	440696.00	8.90	1381.93	4.98	151.12
32	B15	TMDL	Residential	202405.00	4.09	634.70	2.29	69.41
33	B15	TMDL	Residential	90434.00	1.83	283.58	1.02	31.01
34	B15	TMDL	Residential	309729.00	6.26	971.25	3.50	106.21
35	B15	TMDL	Residential	994613.00	20.09	3118.90	11.23	341.06
36	B15	TMDL	#N/A	0.00	0.00	0.00	0.00	0.00
37	B15	TMDL	#N/A	0.00	0.00	0.00	0.00	0.00
38	B15	TMDL	#N/A	0.00	0.00	0.00	0.00	0.00
39	B15	TMDL	Residential	511763.00	10.34	1604.78	5.78	175.49
40	B15	TMDL	Residential	121499.00	2.45	381.00	1.37	41.66
41	B15	TMDL	Residential	245659.00	4.96	770.34	2.77	84.24
42	B15	TMDL	Residential	550128.00	11.11	1725.09	6.21	188.64
43	B15	TMDL	Residential	175496.00	3.55	550.32	1.98	60.18
44	B15	TMDL	Residential	233379.00	4.71	731.83	2.64	80.03
45	B15	TMDL	Residential	36299.00	0.73	113.83	0.41	12.45
46	B15	TMDL	Residential	103801.00	2.10	325.50	1.17	35.59
47	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
48	B15	TMDL	Residential	150484.00	3.04	471.89	1.70	51.60
49	B15	TMDL	Residential	189900.00	3.84	595.49	2.14	65.12
50	B15	TMDL	Residential	240535.00	4.86	754.27	2.72	82.48
51	B15	TMDL	Residential	89102.00	1.80	279.41	1.01	30.55
52	B15	TMDL	Residential	58866.00	1.19	184.59	0.66	20.19
53	B15	TMDL	Residential	19928.00	0.40	62.49	0.23	6.83
54	B15	TMDL	Residential	228934.00	4.62	717.89	2.59	78.50
55	B15	TMDL	Residential	137319.00	2.77	430.60	1.55	47.09
56	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
57	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
58	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
59	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
60	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
61	B16	PRP	Residential	219133.00	4.43	1727.91	2.48	75.14
62	B16	PRP	Residential	483176.00	9.76	3809.94	5.46	165.69
63	B16	PRP	Residential	18159.00	0.37	143.19	0.21	6.23
64	B16	PRP	Residential	49208.00	0.99	388.01	0.56	16.87
65	B16	PRP	Residential	74149.00	1.50	584.68	0.84	25.43
66	B16	PRP	Residential	61947.00	1.25	488.46	0.70	21.24
67	B16	PRP	Residential	28020.00	0.57	220.94	0.32	9.61
68	B16	PRP	Residential	229186.00	4.63	1807.18	2.59	78.59
69	B16	PRP	Residential	454486.00	9.18	3583.71	5.13	155.85
70	B16	PRP	Residential	433072.00	8.75	3414.86	4.89	148.51
71	B16	PRP	Residential	333778.00	6.13	3440.86	4.44	118.78
72	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
73	B16	PRP	Residential	344114.00	6.95	2713.41	3.89	118.00
74	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
75	B16	PRP	Residential	830842.00	16.78	6551.35	9.38	284.90
76	B16	PRP	Residential	475287.00	9.60	3747.73	5.37	162.98
77	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
78	B16	PRP	Residential	68047.00	1.37	536.56	0.77	23.33
79	B16	PRP	Residential	690154.00	13.94	5442.00	7.80	236.66
80	B16	PRP	Residential	845486.00	17.08	6666.82	9.55	289.93
81	B16	PRP	Residential	335056.00	6.77	2641.98	3.78	114.89
82	B16	PRP	Residential	179652.00	3.63	1416.59	2.03	61.60
83	B16	PRP	Residential	120555.00	2.21	1242.78	1.61	42.90
84	B15	TMDL	Residential	2196627.00	40.34	6888.16	29.25	781.73

Outfall ID #		Plan Type	Land Use	Drainage Area	Pervious Dev. Area	Total Sed Load	Total calc P Load	Total calc n Load
85	B16	PRP	Residential	269180.00	4.94	2774.93	3.58	95.79
86a	B15	TMDL	Residential	1048158.00	19.25	3286.80	13.96	373.02
86b	B15	TMDL	Residential	53314.00	0.00	167.18	0.00	0.00
86c	B15	TMDL	Residential	245200.00	0.00	768.90	0.00	0.00
86d	B15	TMDL	Residential	98790.00	0.00	309.78	0.00	0.00
87	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
88	B15	TMDL	Residential	158478.00	2.91	496.95	2.11	56.40
89	B15	TMDL	Residential	586930.00	10.78	1840.49	7.81	208.87
90	B15	TMDL	Residential	455560.00	8.37	1428.54	6.07	162.12
91	B15	TMDL	Residential	1632212.00	29.98	5118.27	21.73	580.87
92	B15	TMDL	Residential	18522.00	0.34	58.08	0.25	6.59
93	B15	TMDL	Commercial	200942.00	2.31	0.00	4.20	81.28
94	B15	TMDL	Commercial	182723.00	2.10	0.00	3.82	73.91
95	B15	TMDL	Commercial	87207.00	1.00	0.00	1.82	35.28
96	Chester Creek	PRP	Commercial	240157.00	2.76	4658.42	5.02	97.14
97	B16	PRP	Residential	79839.00	1.61	629.55	0.90	27.38
98	B16	PRP	Residential	138741.00	2.80	1094.00	1.57	47.58
99	B16	PRP	Residential	35080.00	0.71	276.61	0.40	12.03
100	B16	PRP	Residential	92398.00	1.87	728.58	1.04	31.68
101	B16	PRP	Residential	90569.00	1.83	714.15	1.02	31.06
102	B16	PRP	Residential	946679.00	19.12	7464.75	10.69	324.63
103	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
104	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
105	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
106	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00
107	B16	PRP	Residential	515741.00	10.42	4066.72	5.83	176.85
108	B16	PRP	Residential	318238.00	6.43	2509.37	3.59	109.13
109	B16	PRP	Residential	331796.00	6.70	2616.28	3.75	113.78
110	B16	PRP	Residential	564413.00	11.40	4450.51	6.37	193.54
111	B16	PRP	Residential	563830.00	11.39	4445.91	6.37	193.34
112	B16	PRP	Residential	451771.00	9.13	3562.30	5.10	154.92
113	0	#N/A	#N/A	0.00	0.00	0.00	0.00	0.00

Outfall #	Current Sed Load	% Overall Load	Req'd Longterm Redux	Req'd Permit Term Redux	Ac Imp	Ac Pervious	Infiltration Vol	in/imp ac	#Redux	%Total Long Term Goal	% Total Permit Cycle Goal
1	728.0990794	1.13%	422.74	72.81	0.639641873	4.690707071	0	0	0.00	0.00%	0.00%
2	602.9089353	0.94%	350.06	60.29	0.529661157	3.884181818	0	0	0.00	0.00%	0.00%
3	1744.380395	2.71%	1012.81	174.44	1.532454545	11.238	0	0	0.00	0.00%	0.00%
4	146.005518	0.23%	84.77	14.60	0.128267218	0.940626263	0	0	0.00	0.00%	0.00%
5	156.2532798	0.24%	90.72	15.63	0.137269972	1.006646465	0	0	0.00	0.00%	0.00%
6	797.1836688	1.24%	462.85	79.72	0.700333333	5.135777778	0	0	0.00	0.00%	0.00%
7	546.0696059	0.85%	317.05	54.61	0.479727273	3.518	0	0	0.00	0.00%	0.00%
8	127.1719633	0.20%	73.84	12.72	0.111721763	0.819292929	0	0	0.00	0.00%	0.00%
9	139.5175685	0.22%	81.01	13.95	0.122567493	0.898828283	0	0	0.00	0.00%	0.00%
10	416.2165421	0.65%	241.66	41.62	0.365650138	2.681434343	0	0	0.00	0.00%	0.00%
11	4075.589395	6.34%	2366.34	407.56	3.580443526	26.25658586	10,000	0.769407733	2608.38	6.99%	40.57%
12	256.6989049	0.40%	149.04	25.67	0.225512397	1.653757576	0	0	0.00	0.00%	0.00%
13	520.2714616	0.81%	302.08	52.03	0.457063361	3.35179798	0	0	0.00	0.00%	0.00%
14	77.30349501	0.12%	44.88	7.73	0.067911846	0.498020202	0	0	0.00	0.00%	0.00%
15	623.7305809	0.97%	362.15	62.37	0.547953168	4.018323232	0	0	0.00	0.00%	0.00%
16	270.1733946	0.42%	156.87	27.02	0.237349862	1.740565657	0	0	0.00	0.00%	0.00%
17	301.8574167	0.47%	175.26	30.19	0.265184573	1.944686869	0	0	0.00	0.00%	0.00%
18	1049.655529	1.63%	609.44	104.97	0.922132231	6.76230303	0	0	0.00	0.00%	0.00%
19	421.8421493	0.66%	244.93	42.18	0.370592287	2.717676768	0	0	0.00	0.00%	0.00%
20	147.6047709	0.23%	85.70	14.76	0.129672176	0.950929293	0	0	0.00	0.00%	0.00%
21	86.19973123	0.13%	50.05	8.62	0.075727273	0.555333333	0	0	0.00	0.00%	0.00%
22	139.6053707	0.22%	81.06	13.96	0.122644628	0.899393939	0	0	0.00	0.00%	0.00%
23	197.0310929	0.31%	114.40	19.70	0.173093664	1.269353535	0	0	0.00	0.00%	0.00%
24	49.69913566	0.08%	28.86	4.97	0.043661157	0.320181818	0	0	0.00	0.00%	0.00%
25	5013.403838	7.80%	2910.84	501.34	4.404322314	32.29836364	0	0	0.00	0.00%	0.00%
26	1480.183816	2.30%	859.41	148.02	1.300355372	9.535939394	0	0	0.00	0.00%	0.00%
27	1051.402164	1.64%	610.46	105.14	0.923666667	6.773555556	0	0	0.00	0.00%	0.00%
28	2731.417334	4.25%	1585.89	273.14	2.399575758	17.59688889	0	0	0.00	0.00%	0.00%
29	1574.000382	2.45%	913.88	157.40	1.382774105	10.14034343	0	0	0.00	0.00%	0.00%
30	2363.397884	3.68%	1372.22	236.34	2.076267218	15.2259596	0	0	0.00	0.00%	0.00%
31	1381.930109	2.15%	802.37	138.19	1.214038567	8.902949495	0	0	0.00	0.00%	0.00%
32	634.6995743	0.99%	368.51	63.47	0.557589532	4.088989899	0	0	0.00	0.00%	0.00%
33	283.5820326	0.44%	164.65	28.36	0.249129477	1.826949495	0	0	0.00	0.00%	0.00%
34	971.2451	1.51%	563.92	97.12	0.853247934	6.257151515	0	0	0.00	0.00%	0.00%
35	3118.897496	4.85%	1810.87	311.89	2.739980716	20.09319192	0	0	0.00	0.00%	0.00%
36	0	0.00%	0.00	0.00	0	0	0	N/A	N/A	N/A	N/A
37	0	0.00%	0.00	0.00	0	0	0	N/A	N/A	N/A	N/A
38	0	0.00%	0.00	0.00	0	0	0	N/A	N/A	N/A	N/A
39	1604.781296	2.50%	931.76	160.48	1.409815427	10.33864646	0	0	0.00	0.00%	0.00%
40	380.9953488	0.59%	221.21	38.10	0.334707989	2.454525253	0	0	0.00	0.00%	0.00%
41	770.3350349	1.20%	447.27	77.03	0.676746556	4.962808081	0	0	0.00	0.00%	0.00%
42	1725.085879	2.68%	1001.61	172.51	1.515504132	11.11369697	0	0	0.00	0.00%	0.00%
43	550.3186013	0.86%	319.52	55.03	0.483460055	3.545373737	0	0	0.00	0.00%	0.00%
44	731.8275337	1.14%	424.91	73.18	0.642917355	4.714727273	0	0	0.00	0.00%	0.00%
45	113.8260411	0.18%	66.09	11.38	0.099997245	0.733313131	0	0	0.00	0.00%	0.00%
46	325.4981375	0.51%	188.99	32.55	0.285953168	2.096989899	0	0	0.00	0.00%	0.00%
48	471.8862219	0.73%	273.98	47.19	0.414556474	3.040080808	0	0	0.00	0.00%	0.00%
49	595.4865204	0.93%	345.75	59.55	0.523140496	3.836363636	0	0	0.00	0.00%	0.00%
50	754.2672469	1.17%	437.94	75.43	0.662630854	4.859292929	0	0	0.00	0.00%	0.00%
51	279.4051603	0.43%	162.23	27.94	0.245460055	1.800040404	0	0	0.00	0.00%	0.00%
52	184.591414	0.29%	107.18	18.46	0.162165289	1.189212121	0	0	0.00	0.00%	0.00%
53	62.49002306	0.10%	36.28	6.25	0.054898072	0.402585859	0	0	0.00	0.00%	0.00%
54	717.8889472	1.12%	416.81	71.79	0.630672176	4.624929293	0	0	0.00	0.00%	0.00%
55	430.6035466	0.67%	250.01	43.06	0.378289256	2.774121212	0	0	0.00	0.00%	0.00%
84	6888.160974	10.71%	3999.35	688.82	10.08552342	40.34209366	0	0	0.00	0.00%	0.00%
86a	3286.803372	5.11%	1908.36	328.68	4.812479339	19.24991736	0	0	0.00	0.00%	0.00%
86b	167.1815079	0.26%	97.07	16.72	0	0	0	N/A	N/A	N/A	N/A
86c	768.8957073	1.20%	446.43	76.89	0	0	0	N/A	N/A	N/A	N/A
86d	309.7846938	0.48%	179.86	30.98	0	0	0	N/A	N/A	N/A	N/A
88	496.9537271	0.77%	288.54	49.70	0.727630854	2.910523416	0	0	0.00	0.00%	0.00%
89	1840.489223	2.86%	1068.61	184.05	2.694811754	10.77924702	11,000	1.124495255	1407.97	3.77%	21.90%
90	1428.540491	2.22%	829.43	142.85	2.09164371	8.366574839	0	0	0.00	0.00%	0.00%
91	5118.274063	7.96%	2971.73	511.83	7.494086318	29.97634527	14,500	0.533018995	2815.05	7.54%	43.79%
92	58.08110232	0.09%	33.72	5.81	0.085041322	0.340165289	0	0	0.00	0.00%	0.00%
93	0	0.00%	0.00	0.00	2.306496786	2.306496786	0	0	0.00	0.00%	0.00%
94	0	0.00%	0.00	0.00	2.097371442	2.097371442	0	0	0.00	0.00%	0.00%
95	0	0.00%	0.00	0.00	1.000998623	1.000998623	0	0	0.00	0.00%	0.00%

B16

Scenario 1-Infiltration Bed

Outfall #	Current Sed Load	% Overall Load	Req'd Longterm Redux	Req'd Permit Term Redux	Ac Imp	Ac Pervious	Infiltration Vol	in/imp ac	#Redux	%Total Long Term Goa	% Total Permit Cycle G
61	1727.906968	2.01%	1003.24	172.79	0.603672176	4.426929293	#REF!	N/A	N/A	N/A	N/A
62	3809.938153	4.44%	2212.10	380.99	1.331063361	9.761131313	#REF!	N/A	N/A	N/A	N/A
63	143.1873001	0.17%	83.14	14.32	0.050024793	0.366848485	#REF!	N/A	N/A	N/A	N/A
64	388.0147951	0.45%	225.29	38.80	0.135559229	0.99410101	#REF!	N/A	N/A	N/A	N/A
65	584.6795042	0.68%	339.47	58.47	0.204267218	1.497959596	#REF!	N/A	N/A	N/A	N/A
66	488.4643251	0.57%	283.61	48.85	0.170652893	1.251454545	#REF!	N/A	N/A	N/A	N/A
67	220.943232	0.26%	128.28	22.09	0.077190083	0.566060606	#REF!	N/A	N/A	N/A	N/A
68	1807.176858	2.10%	1049.27	180.72	0.631366391	4.630020202	#REF!	N/A	N/A	N/A	N/A
69	3583.711839	4.17%	2080.75	358.37	1.252027548	9.181535354	#REF!	N/A	N/A	N/A	N/A
70	3414.858221	3.98%	1982.71	341.49	1.193035813	8.748929293	#REF!	N/A	N/A	N/A	N/A
71	3440.855796	4.01%	1997.80	344.09	1.532497704	6.129990817	#REF!	N/A	N/A	N/A	N/A
73	2713.406828	3.16%	1575.44	271.34	0.947972452	6.95179798	#REF!	N/A	N/A	N/A	N/A
75	6551.353202	7.63%	3803.79	655.14	2.288820937	16.78468687	#REF!	N/A	N/A	N/A	N/A
76	3747.73183	4.36%	2175.98	374.77	1.309330579	9.601757576	#REF!	N/A	N/A	N/A	N/A
78	536.5640294	0.62%	311.54	53.66	0.1874573	1.374686869	#REF!	N/A	N/A	N/A	N/A
79	5442.000546	6.34%	3159.69	544.20	1.901250689	13.94250505	#REF!	N/A	N/A	N/A	N/A
80	6666.824033	7.76%	3870.84	666.68	2.329162534	17.08052525	#REF!	N/A	N/A	N/A	N/A
81	2641.98271	3.08%	1533.97	264.20	0.923019284	6.768808081	#REF!	N/A	N/A	N/A	N/A
82	1416.591488	1.65%	822.49	141.66	0.494909091	3.629333333	#REF!	N/A	N/A	N/A	N/A
83	1242.779244	1.45%	721.57	124.28	0.553512397	2.214049587	#REF!	N/A	N/A	N/A	N/A
85	2774.926937	3.23%	1611.16	277.49	1.2359045	4.943617998	#REF!	N/A	N/A	N/A	N/A
97	629.5462775	0.73%	365.52	62.95	0.219942149	1.612909091	#REF!	N/A	N/A	N/A	N/A
98	1094.000176	1.27%	635.19	109.40	0.382206612	2.802848485	#REF!	N/A	N/A	N/A	N/A
99	276.6127258	0.32%	160.60	27.66	0.096639118	0.708686869	#REF!	N/A	N/A	N/A	N/A
100	728.576472	0.85%	423.02	72.86	0.254539945	1.866626263	#REF!	N/A	N/A	N/A	N/A
101	714.1544459	0.83%	414.65	71.42	0.249501377	1.829676768	#REF!	N/A	N/A	N/A	N/A
102	7464.750817	8.69%	4334.12	746.48	2.607931129	19.12482828	15,000	1.584486399	6102.43	71.04%	71.04%
107	4066.719607	4.73%	2361.19	406.67	1.420774105	10.4190101	3,500	0.678635206	2501.03	29.11%	29.11%
108	2509.369459	2.92%	1456.97	250.94	0.876688705	6.429050505	#REF!	N/A	N/A	N/A	N/A
109	2616.276966	3.05%	1519.04	261.63	0.914038567	6.702949495	#REF!	N/A	N/A	N/A	N/A
110	4450.507936	5.18%	2584.02	445.05	1.554856749	11.40228283	7,700	1.364249229	3538.15	41.19%	41.19%
111	4445.910866	5.18%	2581.35	444.59	1.553250689	11.39050505	#REF!	N/A	N/A	N/A	N/A
112	3562.303528	4.15%	2068.32	356.23	1.244548209	9.126686869	#REF!	N/A	N/A	N/A	N/A

Chester Creek

Scenario 1-Infiltration Bed

Outfall #	Current Sed Load	% Overall Load	Req'd Longterm Redux	Req'd Permit Term Redux	Ac Imp	Ac Pervious	Infiltration Vol	in/imp ac	#Redux	%Total Long Term Goa	% Total Permit Cycle G	Est Cost
96	4658.41729	100.00%	2704.73	465.84	2.756623049	2.756623049	1,100	0.109928089	652.18	140.00%	140.00%	#REF!

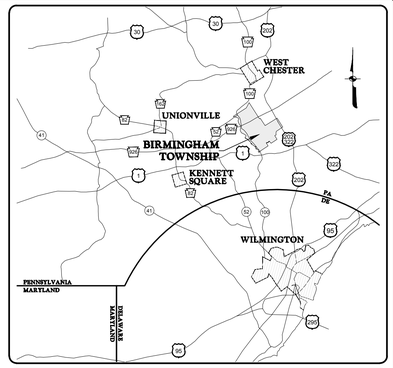
Watershed B15 (58% Reduction in Sediment required per TMDL)															
Outfall#	BMP Location	Outfall Load #/yr	Total Load #/yr	permit redux goal #	Longterm redux goal #	% Total Load	BMP Type	Ac Impervious	Volume (cf)	"/Imp Acre	% Reduction (at outfall)	# redux	% Goal (Permit Cycle)	% Goal (Long Term)	Est Cost
91	Birmingham Hunt Open Space (South of Heritage)	5,118	64,288	6429	37326	7.96%	RR Pond retrofit	7.49	14,500	0.53	55.00%	2,815	43.79%	7.54%	$17,500.00
89	Birmingham Hunt Open space (North of Sumner)	1,840	64,288			2.86%	RR Pond retrofit	2.69	11,000	1.12	76.50%	1,408	21.90%	3.77%	$17,500.00
11	Radley Run Open space (behind 1121 Independence)	4,076	64,288			6.34%	RR Pond retrofit	3.58	10,000	0.77	64.00%	2,608	40.57%	6.99%	$17,500.00
												6,831	106.26%	18.30%	**$52,500.00**
Watershed B16 (No WLA for BT in TMDL Document, 10% Sediment reduction required per Pollutant Reduction Plan)															
102	D-town Oak Estates Open space (Pheasant Run)	7,465	85,903	8590.2627	n/a	8.69%	RR Pond Retrofit	2.61	15,000	1.58	81.75%	6,102	71.04%	n/a	$17,500.00
107	Reserve at Chadds Ford (Masters Way loop)	4,067	85,903			4.73%	RR Pond Retrofit	1.42	3,500	0.68	61.50%	2,501	29.11%	n/a	$17,500.00
110	Reserve at Chadds Ford (open space)	4,451	85,903			5.18%	RR Pond Retrofit	1.55	7,700	1.36	79.50%	3,538	41.19%	n/a	$17,500.00
													141.34%		**$52,500.00**
Chester Creek (No TMDL for Chester Creek, 10% Sediment reduction required per Pollutant Reduction Plan)															
96	Carousel Hyundai Pond	4,658	4,658	465.84173	n/a	100.00%	ST Pond Retrofit	2.76	1,100	0.11	14.00%	652	140.00%	n/a	**$17,500.00**
														Total Est. Cost =	**$122,500.00**

Cost Basis

Est. construction cost to reconfigure outfall structure=	$10,000.00
Est construction cost /cf infiltration constructed=	$10.25
Incidental (access, legal, etc.) Multiplier=	1.75
Est. total cost to reconfigure outfall structure=	$17,500.00
Est total cost /cf infiltration constructed	$17.94

LEGEND

- STORM SEWER W/OUTFALL
- STORMWATER MANAGEMENT FACILITY
- URBANIZED AREA
- PROPERTY LINE
- STREAM



LOCATION PLAN NOT TO SCALE

CHART OF DISCHARGE POINTS

⊕ OUTLET LOCATION

NO.	PAGE	LOCATION	RECEIVING BODIES OF WATER	OWNERSHIP	NPDES PH2 PERMIT (Y/N)
1	2	804 N WASHINGTON RIDGE	PLUM RUN	TOWNSHIP	N
2	2	813 GENERAL CORNWALLIS DRIVE	PLUM RUN	TOWNSHIP	N
3	2	804 GENERAL STERLING DRIVE	RADLEY RUN	TOWNSHIP	Y
4	2	804 HESSIAN CIRCLE	BRANDYWINE RIVER	TOWNSHIP	N
5	2	816 HESSIAN CIRCLE	PLUM RUN	TOWNSHIP	N
6	2	1131 COUNTRY CLUB DRIVE	RRCC LAGOON	TOWNSHIP	N
7	2	1121 COUNTRY CLUB DRIVE	RRCC LAGOON	TOWNSHIP	N
8	2	1072 COUNTRY CLUB DRIVE	RADLEY RUN	TOWNSHIP	N
9	2	1070 COUNTRY CLUB DRIVE	RADLEY RUN	TOWNSHIP	N
10	2	1053 COUNTRY CLUB DRIVE	RADLEY RUN	TOWNSHIP	N
11	2	1121 INDEPENDENCE DRIVE	RADLEY RUN	HOA	N
12	2	1107 INDEPENDENCE DRIVE	RADLEY RUN	TOWNSHIP	N
13	2	1103 INDEPENDENCE DRIVE	RADLEY RUN	TOWNSHIP	N
14	2	1101 INDEPENDENCE DRIVE	RADLEY RUN	TOWNSHIP	Y
15	2	1007 MANSION VIEW DRIVE	RADLEY RUN	TOWNSHIP	N
16	2	1007 MANSION VIEW DRIVE	RADLEY RUN	TOWNSHIP	N
17	2	1005 MANSION VIEW DRIVE	RADLEY RUN	TOWNSHIP	N
18	2	1112 FORSYTH LANE	RADLEY RUN	TOWNSHIP	N
19	2	1007 GENERAL LAFAYETTE BLVD	RADLEY RUN	TOWNSHIP	N
20	2	1000 LAKEVIEW DRIVE	RADLEY RUN	TOWNSHIP	N
21	2	1006 MATHER LANE	RADLEY RUN	TOWNSHIP	N
22	2	1006 SABER ROAD	RADLEY RUN	TOWNSHIP	N
23	2	1019 RADLEY DRIVE	RADLEY RUN	TOWNSHIP	N
24	2	1028 RADLEY DRIVE	RADLEY RUN	TOWNSHIP	N
25	2	1000 ARTILLERY POINT ROAD	RADLEY RUN	HOA	N
26	2	1003 LAMBOURNE ROAD	RADLEY RUN	PRIVATE	N
27	2	988 E. REGIMENTAL DRIVE	PLUM RUN	PRIVATE	N
28	2	909 GENERAL HOWE DRIVE	PLUM RUN	TOWNSHIP	Y
29	2	BIRMINGHAM RD. & RADLEY RUN	RADLEY RUN	PaDOT	N
30	2	989 WHITETAIL LANE	RADLEY RUN	HOA	N
31	2	934 SIDNEY RUN DRIVE	RADLEY RUN	HOA	N
32	2	1001 CEDAR MILL LANE	RADLEY RUN	TOWNSHIP	N
33	2	1061 CEDAR MILL LANE	RADLEY RUN	HOA	N
34	2	1135 ALEXANDER LANE	RADLEY RUN	HOA	N
35	2	1111 DANIEL DAVIS LANE	RADLEY RUN	PRIVATE	N
36	2	1013 REVOLUTIONARY DRIVE	RADLEY RUN S.	TOWNSHIP	N
37	3	1013 REVOLUTIONARY DRIVE	RADLEY RUN S.	TOWNSHIP	N
38	3	1021 REVOLUTIONARY DRIVE	RADLEY RUN S.	TOWNSHIP	N
39	3	1116 GENERAL LAFAYETTE BLVD	RADLEY RUN S.	TOWNSHIP	Y
40	3	1108 RADLEY DRIVE	RADLEY RUN S.	TOWNSHIP	N
41	3	1101 SHERBROOKE DRIVE	RADLEY RUN S.	PaDOT	N
42	3	1101 SHERBROOKE DRIVE	RADLEY RUN S.	TOWNSHIP	N
43	3	1107 HAMPSHIRE PLACE	RADLEY RUN S.	TOWNSHIP	N
44	3	1111 SHERBROOKE DRIVE	RADLEY RUN S.	TOWNSHIP	N
45	3	1181 HAMPSHIRE PLACE	RADLEY RUN S.	TOWNSHIP	N
46	3	1149 DORSET DRIVE	RADLEY RUN S.	TOWNSHIP	N
47	3	1140 DORSET DRIVE	RADLEY RUN S.	TOWNSHIP	Y
48	3	1129 DORSET DRIVE	RADLEY RUN	TOWNSHIP	N
49	3	1121 DORSET DRIVE	RADLEY RUN	TOWNSHIP	N
50	3	1111 DORSET DRIVE	RADLEY RUN	TOWNSHIP	Y
51	3	905 GENERAL WAYNE DRIVE	RADLEY RUN	TOWNSHIP	Y
52	3	913 GENERAL WAYNE DRIVE	RADLEY RUN	TOWNSHIP	Y
53	3	918 GENERAL WAYNE DRIVE	RADLEY RUN	TOWNSHIP	Y
54	3	1102 DORSET DRIVE	RADLEY RUN	TOWNSHIP	Y
55	3	1161 ARROWHEAD DRIVE	RADLEY RUN S.	HOA	N
56	3	1168 ARROWHEAD DRIVE	RENWICK RUN	HOA	N
57	3	1178 ARROWHEAD DRIVE	RENWICK RUN	HOA	N
58	3	1167 RENWICK DRIVE	RENWICK RUN	TOWNSHIP	N
59	3	1165 RENWICK DRIVE	RENWICK RUN	HOA	N
60	3	1025 MEETINGHOUSE ROAD	RENWICK RUN	TOWNSHIP	Y
61	3	1088 HEARTSEASE DRIVE	WYLIE RUN N.	HOA	N
62	3	1065 WYLIE ROAD	WYLIE RUN N.	PRIVATE	N
63	3	1063 WYLIE ROAD	WYLIE RUN N.	PaDOT	N
64	3	1063 WYLIE ROAD	WYLIE RUN N.	PaDOT	N

⊕ OUTLET LOCATION

NO.	PAGE	LOCATION	RECEIVING BODIES OF WATER	OWNERSHIP	NPDES PH2 PERMIT (Y/N)
65	4	1065 HEARTSEASE DRIVE	WYLIE RUN N.	TOWNSHIP	N
66	4	145 FIRETHORNE DRIVE	WYLIE RUN N.	HOA	N
67	4	12 FIRETHORNE DRIVE	WYLIE RUN N.	TOWNSHIP	N
68	4	270 FIRETHORNE DRIVE	WYLIE RUN N.	TOWNSHIP	N
69	4	330 FIRETHORNE DRIVE	WYLIE RUN N.	HOA	N
70	4	811 PHEASANT RUN	WYLIE RUN S.	HOA	N
71	4	1324 CREST DRIVE	RADLEY RUN	TOWNSHIP	Y
72	4	648 KADAR DRIVE	BRINTON RUN	TOWNSHIP	Y
73	4	645 GENERAL WEEDON DRIVE	BRINTON RUN	TOWNSHIP	Y
74	4	643 GENERAL WEEDON DRIVE	BRINTON RUN	TOWNSHIP	Y
75	4	630 GENERAL WEEDON DRIVE	BRINTON RUN	TOWNSHIP	Y
76	4	620 GENERAL WEEDON DRIVE	BRINTON RUN	TOWNSHIP	Y
77	4	580 WINTURFORD DRIVE	BRINTON RUN	HOA	N
78	4	625 GENERAL WEEDON DRIVE	BRINTON RUN	TOWNSHIP	N
79	4	1347 FIELDPOINT DRIVE	BRINTON RUN	HOA	N
80	4	1306 FIELDPOINT DRIVE	WYLIE RUN N.	TOWNSHIP	Y
81	4	1304 FIELDPOINT DRIVE	WYLIE RUN N.	HOA	N
82	4	678 FARMSTEAD DRIVE	BRINTON RUN	TOWNSHIP	N
83	4	1368 BRINTON RUN DRIVE	RADLEY RUN	HOA	N
84	4	405 KNOLLS ROAD	RADLEY RUN	HOA	N
85	4	355 KNOLLS ROAD	RADLEY RUN	TOWNSHIP	Y
86A	4	340 LEA DRIVE	RADLEY RUN	TOWNSHIP	Y
86B	4	1321 LEA DRIVE	RADLEY RUN	TOWNSHIP	Y
86C	4	1315 LEA DRIVE	RADLEY RUN	TOWNSHIP	Y
86D	4	1293 SUMNER WAY	RADLEY RUN	TOWNSHIP	Y
87	4	310 LEA DRIVE	RADLEY RUN	TOWNSHIP	Y
88	4	301 LEA DRIVE	RADLEY RUN	TOWNSHIP	Y
89	4	430 SUMNER WAY	RADLEY RUN	HOA	N
90	4	924 ADAMS WAY	RADLEY RUN	HOA	N
91	4	730 HERITAGE DRIVE	RADLEY RUN	HOA	N
92	4	1023 ADAMS WAY	RADLEY RUN	HOA	N
93	4	1288 WILMINGTON PIKE	RADLEY RUN	TOWNSHIP	Y
94	4	1288 WILMINGTON PIKE	RADLEY RUN	TOWNSHIP	Y
95	4	1288 WILMINGTON PIKE	RADLEY RUN	TOWNSHIP	Y
96	4	1379 FAUCETT DRIVE	W. BR. CHESTER CR.	TOWNSHIP	N
97	5	845 DEER CROSSING	WYLIE RUN S.	TOWNSHIP	N
98	5	869 DEER CROSSING	WYLIE RUN S.	TOWNSHIP	Y
99	5	875 DEER CROSSING	WYLIE RUN S.	TOWNSHIP	Y
100	5	835 DEER CROSSING	WYLIE RUN S.	TOWNSHIP	Y
101	5	829 DEER CROSSING	WYLIE RUN S.	TOWNSHIP	Y
102	5	875 DEER CROSSING	WYLIE RUN S.	HOA	N
103	5	876 SILVERWOOD DRIVE	BRINTON RUN	HOA	N
104	5	872 PENNS WAY	BRINTON RUN	HOA	N
105	5	856 PENNS WAY	BRINTON RUN	TOWNSHIP	Y
106	5	678 KADAR DRIVE	BRINTON RUN	TOWNSHIP	Y
107	5	1826 MASTERS WAY	BRINTON RUN	HOA	N
108	5	1812 MASTERS WAY	BRANDYWINE RIVER	HOA	N
109	5	1708 ROSEWOOD LANE	BRANDYWINE RIVER	HOA	N
110	5	1612 MASTERS WAY	BRANDYWINE RIVER	HOA	N
111	5	MASTERS WAY & CREEK ROAD	BRANDYWINE RIVER	HOA	N
112	5	717 PHEASANT RUN	BRINTON RUN	HOA	N
113	5	11 LAFAYETTE PLACE	BRINTON RUN	TOWNSHIP	Y

BODIES OF WATER: BRANDYWINE RIVER
BRINTON RUN
PLUM RUN
RENWICK RUN
RADLEY RUN S.
RENWICK RUN
RRCC LAGOON
WEST BRANCH CHESTER CREEK
WYLIE RUN N.
WYLIE RUN S.

HOA: HOME OWNERS ASSOCIATION
PRIVATE: PRIVATE SYSTEM
TOWNSHIP: BIRMINGHAM TOWNSHIP
PaDOT: PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

INVENTORY OF DISCHARGE POINTS & STORMWATER MANAGEMENT FACILITIES FOR BIRMINGHAM TOWNSHIP

SCALE: 1"=900' FEBRUARY 19, 2004

900 0 450 900 1800 3600

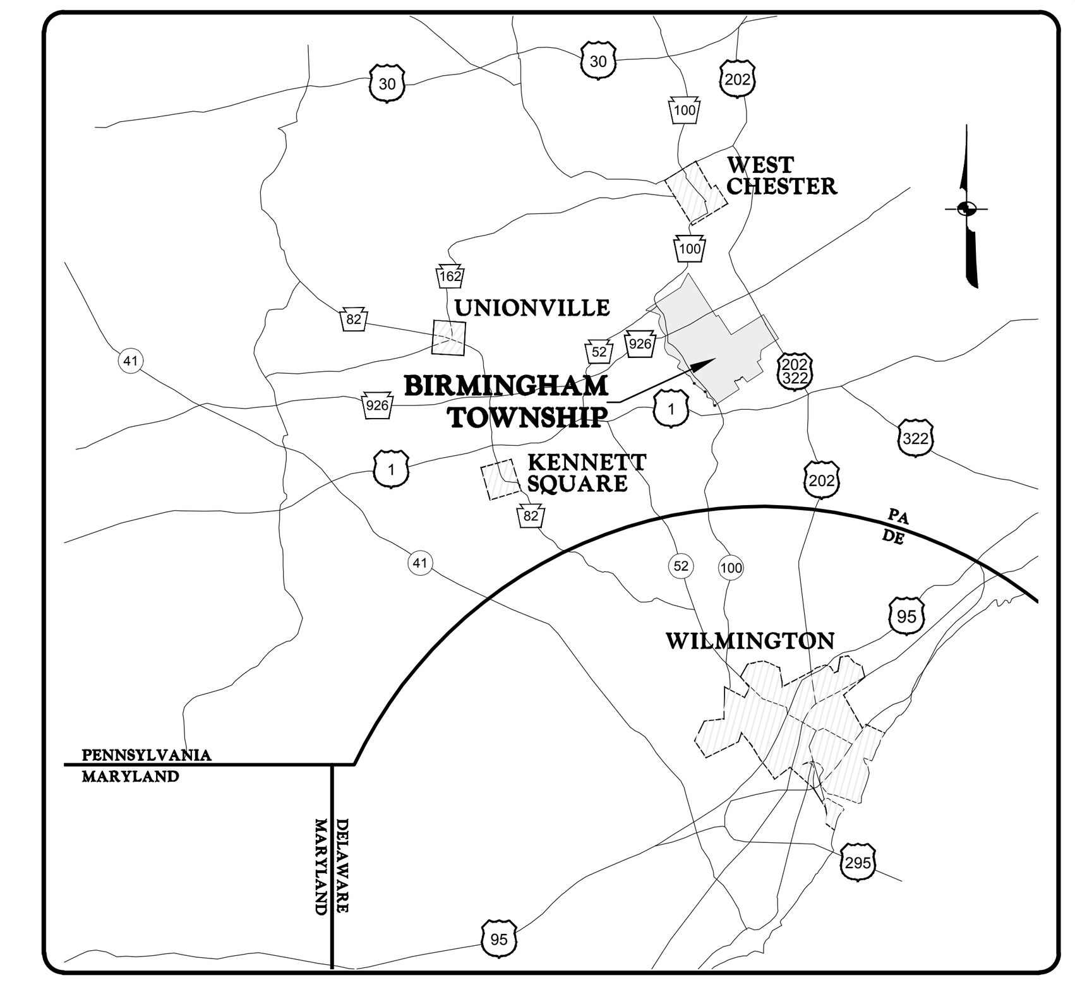
GRAPHIC SCALE (FEET)

NO.	DATE	REVISION	BY	APPROVED
2	7/5/2017	ADDED DRAINAGE AREAS	NAC	JWH
1	08/22/07	STORMWATER MANAGEMENT FACILITIES ADDED	KDM	JWH

VANDEMARK & LYNCH, INC.
ENGINEERS – PLANNERS – SURVEYORS
4305 MILLER RD./PO BOX 2047
WILMINGTON, DE 19899/(302) 764-7635

PERMANENT FILE	QA REVIEW	APPROVED BY
BIRMINGHAM TOWNSHIP		
SURVEYED BY	PROJECT MANAGER	
	J. HATFIELD	
COMPUTED BY	DRAWN BY	
	D. KOWALCH	
PROJECT NO.	FILE NO.	REVISION
19190.80	36774-L	2

1 OF 7



LOCATION PLAN NOT TO SCALE

CHART OF STORMWATER BASINS

STORMWATER BASIN LOCATION

ID #	V&L PROJECT NUMBER	NAME / SUBDIVISION	LOCATION	DESCRIPTION	OWNER / RESPONSIBLE PARTY
SB-1	8863.02	Roundelay	Roundelay Drive, House #911	Subsurface Bed	TOWNSHIP
RB-2	8863.04	Spring Meadows	Dorset Drive between House #1102 & #1112	Retention Basin	HOA
DB-3	8863.05	Heartease	Heartsease Drive, rear of House #1086 & #1088	Detention Basin	HOA
DB-4	8863.07	Firethorne Estates	Firethorne Drive open space, north side of entrance	Detention Basin	HOA
DB-5	8863.07	Firethorne Estates	Firethorne Drive, rear of House #360 & #330	Detention Basin	HOA
DB-6	8863.08	Dilworthtown Estates	Brinton Run Road, House #1368	Detention Basin	OWNER of House #1368
DB-7	8863.09	Radley Run Phase II	Independence Drive, House #1121	Detention Basin	HOA
DB-8	8863.10	Woodside	Penns Way entrance open space (House #872)	Detention Basin	HOA
DB-9	8863.12	Radley Run Phase III	Radley Drive, rear of House #1008 & #1010	Detention Basin	HOA
RB-10	8863.12	Radley Run Phase III	Mather Lane, rear open space behind House #1007 & #1008	Retention Basin	HOA
DB-11	8863.15	Century Farms	Arrowhead Drive, entrance near House #1161	Detention Basin	OWNER of House #1161
DB-12	8863.15	Century Farms	Arrowhead Drive, rear of House #1166 & #1168	Detention Basin	OWNER of House #1166 & #1168
DB-13	8863.15	Century Farms	Arrowhead Drive, House #1178	Detention Basin	OWNER of House #1178
SB-14	8863.17	Keystone Honda (Acura)	1340 Wilmington Pike, SB Route 202, NW rear of lot	Subsurface Bed	OWNER of Establishment
DB-15	8863.17	Keystone Honda (Acura)	1360 Wilmington Pike, SB Route 202, SE side of lot	Detention Basin	OWNER of Establishment
DB-16	8863.18	Fair Meadows	Daniel Davis Drive, House #1111	Detention Basin	OWNER of House #1111
DB-17	8863.19	Stillman Automotive	1290 Wilmington Pike, SB Route 202, rear of lot	Detention Basin	OWNER of Establishment
DB-18	8863.21	Silverwood	Silverwood Drive east open space behind House #872, #874 & #876	Detention Basin	HOA
DB-19	8863.23	Sheehy Ford	1330 Wilmington Pike, SB Route 202, open space at entrance	Detention Basin	OWNER of Establishment
DB-20	8863.23	Sheehy Ford	1330 Wilmington Pike, SB Route 202, open space at entrance	Detention Basin	OWNER of Establishment
DB-21	8863.26	Radley Run Phase IV	East Regimental Drive, House #988	Detention Basin	OWNER of House #988 (VEG) / HOA (OS)
DB-22	8863.28	Birmingham Hunt	Adams Way, southeast open space, House #924	Detention Basin	HOA
DB-23	8863.28	Birmingham Hunt	Sumner Way, northern open space, House #430	Detention Basin	HOA
DB-24	8863.28	Birmingham Hunt	Open space behind Heritage Drive, House #730 & #732	Detention Basin	HOA
DB-25	8863.30	Reserve at Chadds Ford, Phase I	Masters Way entrance open space	Detention Basin	HOA
DB-26	8863.30	Reserve at Chadds Ford, Phase I	Masters Way behind #House 1608, #1610 & #1612	Detention Basin	HOA
DB-27	8863.41	The Knolls of Birmingham	Open space next to inter. of Knolls Rd. & Sumner Way	Detention Basin	HOA
RB-28	8863.41	The Knolls of Birmingham	Open space along Knolls Road	Retention Basin	HOA
SB-29	8863.44	Wenner Ford	1309 Wilmington Pike, NB Route 202	Subsurface Bed	OWNER of Establishment
DB-30	8863.45	Wylie Farm, Robert Kane	Continental Line Lane, House #1285	Detention Basin	OWNER of House #1285
DB-31	8863.45	Wylie Farm	Queen's Rangers' Lane, #1145	Detention Basin	OWNER of House #1145
DB-32	8863.45	Wylie Farm	Queen's Rangers' Lane, #1135	Detention Basin	OWNER of House #1135
DB-33	8863.45	Wylie Farm	Queen's Rangers' Lane, #1125	Detention Basin	OWNER of House #1125
DB-34	8863.45	Wylie Farm	Queen's Rangers' Lane, #1130	Detention Basin	OWNER of House #1130
DB-35	8863.45	Wylie Farm	Queen's Rangers' Lane, #1130	Detention Basin	OWNER of House #1130
DB-36	8863.45	Wylie Farm	Queen's Rangers' Lane, #1140	Detention Basin	OWNER of House #1140
DB-37	8863.45	Wylie Farm	Queen's Rangers' Lane, #1150	Detention Basin	OWNER of House #1150
DB-38	8863.45	Wylie Farm	Continental Drive, #1280	Detention Basin	OWNER of House #1280
DB-39	8863.45	Wylie Farm	Continental Drive, #1290	Detention Basin	OWNER of House #1290
DB-40	8863.48	Ashwell	Lambourne Lane, #1003	Detention Basin	OWNER of House #1003
DB-41	8863.63	Hamilton Place, Phase I	Alexander Lane, rear of House #1135	Detention Basin	HOA
DB-42	8863.63	Hamilton Place, Phase I	Little Ridge Drive, #1000 & #1010	Detention Basin	HOA
DB-43	8863.64	Fernbank Farm	Country Club Drive, House #1031, rear of lot	Detention Basin	OWNER of House #1031
RB-44	8863.64	Fernbank Farm	Squire Cheyney Drive, House #1045, rear of lot	Retention Basin	OWNER of House #1045
DB-45	8863.70	Reserve at Chadds Ford, Phase II	Open space inside loop of Masters Way, between House #1811 & #1813	Detention Basin	HOA
DB-46	8863.70	Reserve at Chadds Ford, Phase II	Rosewood Lane, open space behind House #1704, #1706 & #1708	Detention Basin	HOA
DB-47	8863.70	Reserve at Chadds Ford, Phase II	Masters Way, open space behind Hosue #1812 & #1814	Detention Basin	HOA
SB-48	8863.74	Winturford	Open Space near House #580	Subsurface Bed	OWNER of House #580
DB-49	8863.79	Hamilton Place, Phase II	Cedar Mill Lane, rear of #1061 & #1051	Detention Basin	HOA
DB-50	8863.83	Hamilton Place, Phase III	White Tail Drive, rear of #988 & #992	Detention Basin	HOA
DB-51	8863.83	Hamilton Place, Phase III	Stoney Run Drive, open space near entrance and rear of House #910	Detention Basin	HOA
DB-52	8863.84	Renwick	Renwick Drive, House #1165	Detention Basin	OWNER of House #1165
DB-53	8863.87	Roberta M. O'Dell	Meetinghouse Road, House #1050, corner of Meetinghouse Rd. & Birmingham Rd.	Detention Basin	OWNER of House #1050
DB/SB-54	8863.88	Robert & Diane Coppick	Lot 2 of Hineman subdivision Meetinghouse Road, House #1142	Detention / Infiltration Basin	OWNER of House #1142
DB-55	8863.91	Mobil / "On the Run"	1311 Old Wilmington Pike, SB Route 202, open space near Old Wilm. Pike	Detention Basin	OWNER of Establishment
SB-56	8863.91	Mobil / "On the Run"	1302 Wilmington Pike, SB Route 202, under entrance at Old Wilm. Pike	Subsurface Bed	OWNER of Establishment
DB/SB-57	8863.92	Legacy Lane	Legacy Lane, open space near entrance & House #1100	Detention / Infiltration Basin	OWNER of House #1100
SB-58	8863.92	Legacy Lane	Legacy Lane, House #1108 & #1110	Subsurface Bed	OWNER of Houses #1108 & #1110
SB-59	8863.92	Legacy Lane	Legacy Lane, Manhole 3, between House #1115 & #1117	Subsurface Bed	TOWNSHIP
SB-60	19190.09	Dilworthtown Inn	1388 Old Wilmington Pike, West Parking lot near Old Wilmington Pike (Reserve parking)	Subsurface Bed	OWNER of Establishment
SB-61	19190.09	Dilworthtown Inn	1391 Old Wilmington Pike, East Parking lot near Brinton's Bridge Road	Subsurface Bed	OWNER of Establishment
DB/SB-62	19190.12	Beechwood Motel	1310 Wilmington Pike, SB Route 202, west side of lot	Detention / Infiltration Basin	OWNER of Establishment
SB-63	19190.14	Sunoco	1301 Wilmington Pike, NB Route 202, beneath entrance	Subsurface Bed	OWNER of Establishment
SB-64	19190.34	Merecedes	1260 Wilmington Pike, SB Route 202, southeast parking lot	Subsurface Bed	OWNER of Establishment
SB-65	19190.34	Merecedes	1260 Wilmington Pike, SB Route 202, northwest parking lot	Subsurface Bed	OWNER of Establishment
DB-66	19190.37	Howard Harris, Lot 3 of Jones Subdivision"	1401 Creek Road, Intersection of Brinton's Bridge Rd. & Creek Rd.	Detention Basin	OWNER of House #1401
DB-67	19190.46	Dilworthtown Oak Estates	Pheasant Run, rear of House #719 & #717	Detention Basin	HOA
DB-68	19190.46	Dilworthtown Oak Estates	Pheasant Run, rear of House #817 & #811	Detention Basin	HOA
DB-69	19190.46	Dilworthtown Oak Estates	Open space between Deer Crossing & Pheasant Run	Detention Basin	HOA
SB-70	19190.47	Wylie Farm, Robert Kane	Continental Line Lane, House #1285	Subsurface Bed	OWNER of House #1285
SB-71	19190.47	Wylie Farm, Robert Kane	Continental Line Lane, House #1285	Subsurface Bed	OWNER of House #1285
DB-72	19190.55	Otto's BMW	1275 Wilmington Pike, NB Route 202, open space near southern entrance	Detention Basin	OWNER of Establishment
PP-73	19190.55	Otto's BMW	1275 Wilmington Pike, NB Route 202, north inventory parking lot	Porous Paving	OWNER of Establishment
SB-74	19190.55	Otto's BMW	1275 Wilmington Pike, NB Route 202, north inventory parking lot	Subsurface Bed	OWNER of Establishment
DB/SB-75	19190.62	Carol & Eric Metzker	1190 W. Street Road, SE Route 926, behind House #1164 & #1166 of Century Farms (Arrowhead Drive)	Detention / Infiltration Basin	OWNER of House #1190
SB-76	19190.62	Carol & Eric Metzker	1190 W. Street Road, SE Route 926, lot driveway"	Subsurface Bed	OWNER of House #1190
DB-77	19190.70	Plazza West Chester (former site of Brandywine Motel)	1320 Wilmington Pike, SB 202, open space near Route 202 & entrance	Detention Basin	OWNER of Establishment
SB-78	19190.70	Plazza West Chester (former site of Brandywine Motel)	1320 Wilmington Pike, SB 202, below entrance at Route 202	Subsurface Bed	OWNER of Establishment
SB-79	19190.70	Plazza West Chester (former site of Brandywine Motel)	1320 Wilmington Pike, SB 202, below entrance at Route 202	Subsurface Bed	OWNER of Establishment
SB-80	19190.72	Roundelay Associates	1479 Creek Road, Rear of House #917 of Roundelay SD	Subsurface Bed	OWNER of Establishment
SB-81	19190.72	Roundelay Associates	1479 Creek Road, Rear of House #917 of Roundelay SD	Subsurface Bed	OWNER of Establishment

KEY:
DB Detention Basin
DB/SB Detention / Infiltration Basin
PP Porous Paving
RB Retention Basin
SB Subsurface Bed

900 0 450 900 1800 3600

GRAPHIC SCALE (FEET)

NO.	DATE	REVISION	BY	APPROVED
2	7/5/2017	ADDED DRAINAGE AREAS	NAC	JWH
1	08/22/07	STORMWATER MANAGEMENT FACILITIES ADDED	KDM	JWH

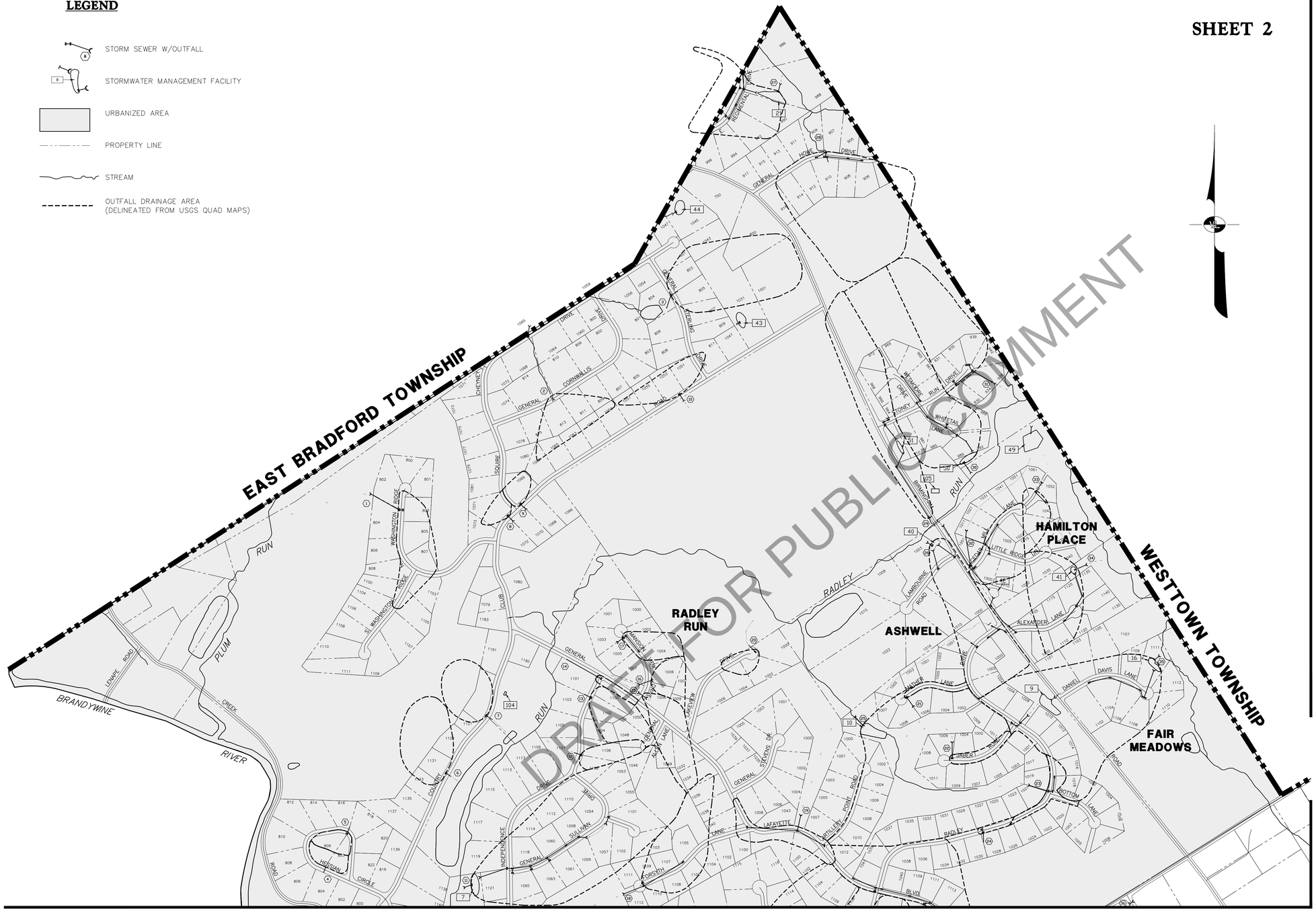
VANDEMARK & LYNCH, INC.
ENGINEERS – PLANNERS – SURVEYORS
4305 MILLER RD./PO BOX 2047
WILMINGTON, DE 19899/(302) 764–7635

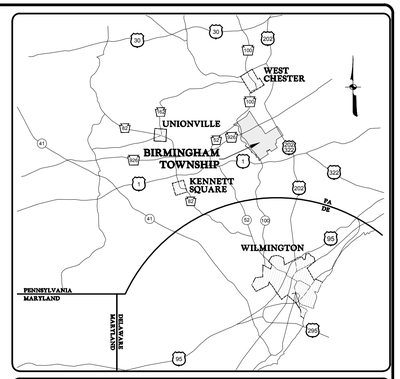
PERMANENT FILE: BIRMINGHAM TOWNSHIP
QA REVIEW:
APPROVED BY:
SURVEYED BY:
COMPUTED BY:
PROJECT MANAGER: J. HATFIELD
DRAWN BY: D. KUKULICH
PROJECT NO.: 19190.80
FILE NO.: 36774–L
2 OF 7
REVISION: 2

LEGEND

- STORM SEWER W/OUTFALL
- STORMWATER MANAGEMENT FACILITY
- URBANIZED AREA
- PROPERTY LINE
- STREAM
- OUTFALL DRAINAGE AREA (DELINEATED FROM USGS QUAD MAPS)

SHEET 2





LOCATION PLAN NOT TO SCALE

MATCH SHEET 4

900 0 450 900 1800 3600

GRAPHIC SCALE (FEET)

MATCH SHEET 3

NO.	DATE	REVISION	BY	APPROVED
2	7/5/2017	ADDED DRAINAGE AREAS	NAC	JWH
1	08/22/07	STORMWATER MANAGEMENT FACILITIES ADDED	KDM	JWH

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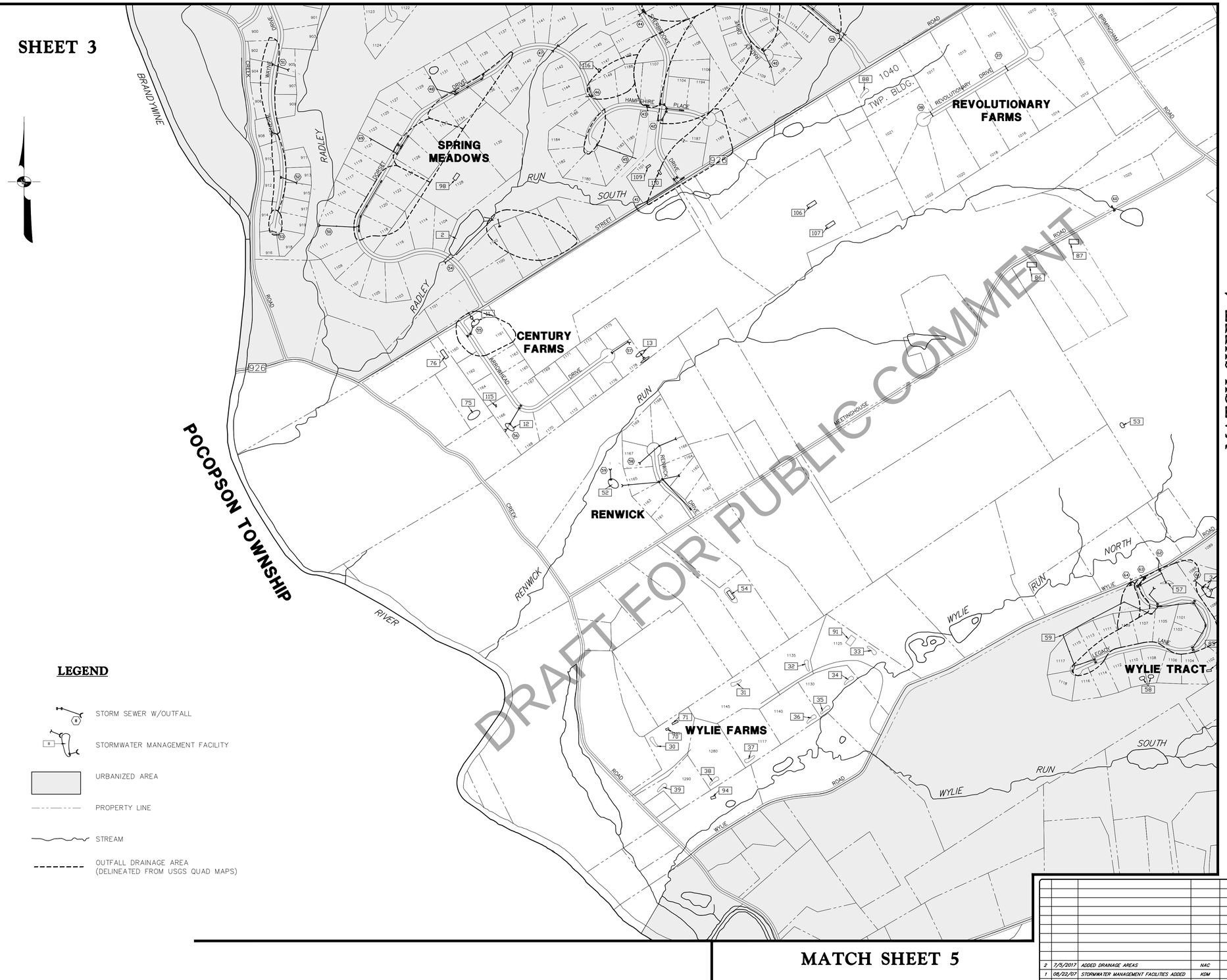
ENGINEERS – PLANNERS – SURVEYORS
4305 MILLER RD./PO BOX 2047
WILMINGTON, DE 19899/(302) 764-7635

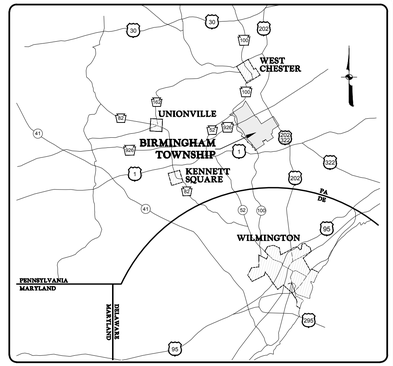
PERMANENT FILE: BIRMINGHAM TOWNSHIP	QA REVIEW	APPROVED BY	
SURVEYED BY	PROJECT MANAGER: J. MATTIELO		
COMPUTED BY	DRAWN BY: D. KURULICH		
PROJECT NO.: 19190.80	FILE NO.: 36774-L	3 OF 7	REVISION: 2

MATCH SHEET 2

SHEET 3



MATCH SHEET 4



LOCATION PLAN NOT TO SCALE

LEGEND

- STORM SEWER W/OUTFALL
- STORMWATER MANAGEMENT FACILITY
- URBANIZED AREA
- PROPERTY LINE
- STREAM
- OUTFALL DRAINAGE AREA (DELINEATED FROM USGS QUAD MAPS)

900 0 450 900 1800 3600

GRAPHIC SCALE (FEET)

MATCH SHEET 5

NO.	DATE	REVISION	BY	APPROVED
2	7/5/2017	ADDED DRAINAGE AREAS	NAC	JWH
1	08/22/07	STORMWATER MANAGEMENT FACILITIES ADDED	KDM	JWH

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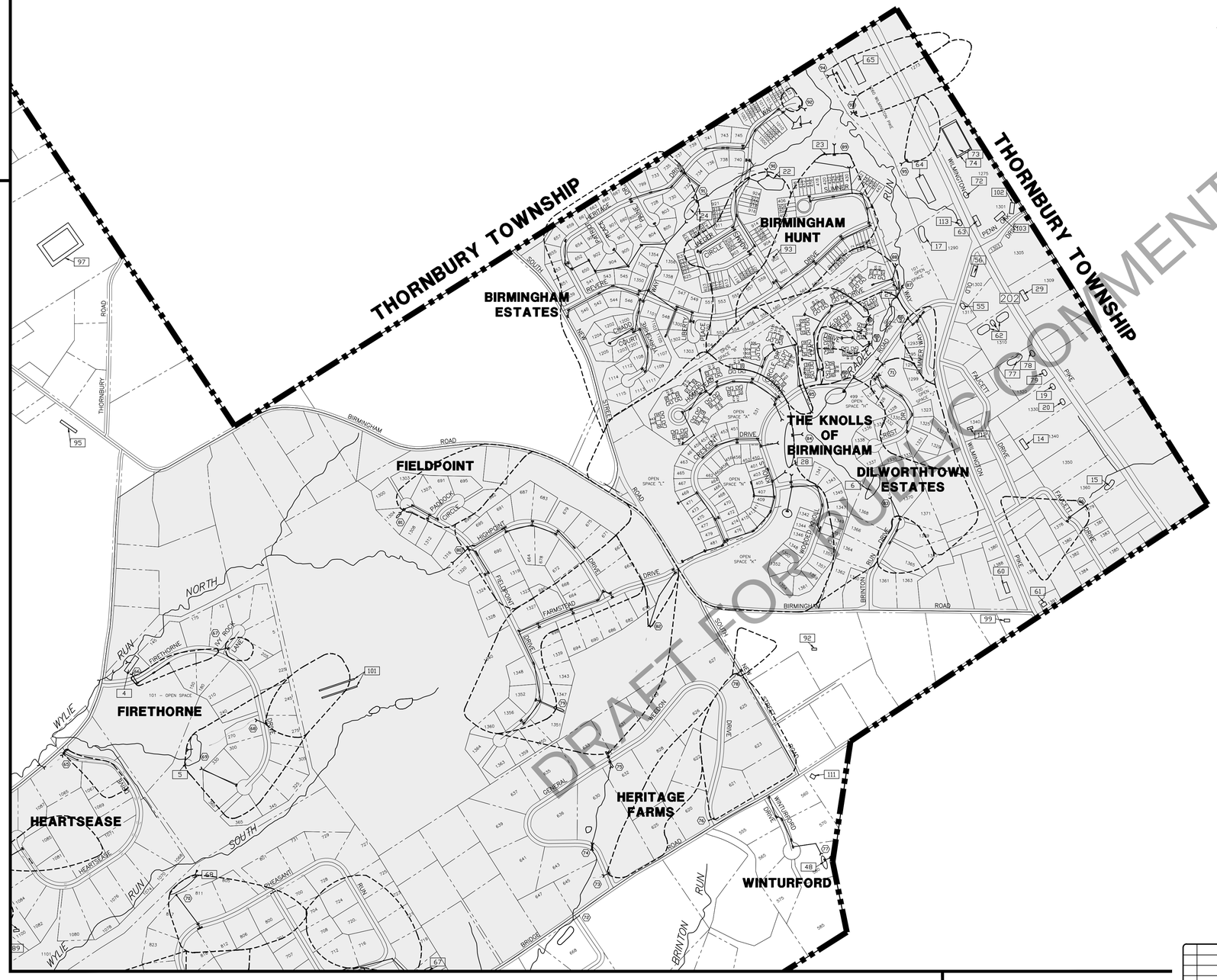
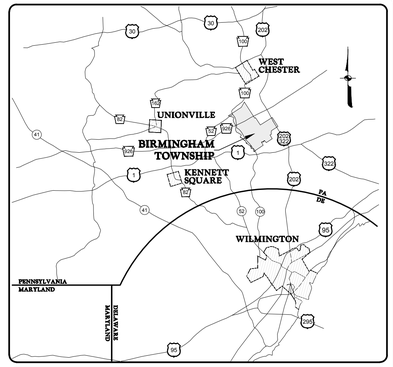
PERMANENT FILE: BIRMINGHAM TOWNSHIP	QA REVIEW	APPROVED BY
SURVEYED BY / COMPUTED BY	PROJECT MANAGER: J. HATFIELD / DRAWN BY: D. KUKULICH	
PROJECT NO.: 19190.80	FILE NO.: 36774-L	4 OF 7
		REVISION: 2

MATCH SHEET 2

MATCH SHEET 3

SHEET 4





LOCATION PLAN NOT TO SCALE

LEGEND

- STORM SEWER W/OUTFALL
- STORMWATER MANAGEMENT FACILITY
- URBANIZED AREA
- PROPERTY LINE
- STREAM
- OUTFALL DRAINAGE AREA (DELINEATED FROM USGS QUAD MAPS)

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GRAPHIC SCALE (FEET)

MATCH SHEET 5

NO.	DATE	REVISION	BY	APPROVED
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1	08/22/07	STORMWATER MANAGEMENT FACILITIES ADDED	KDM	JWH

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4305 MILLER RD./PO BOX 2047
WILMINGTON, DE 19899/(302) 764-7635

PERMANENT FILE: BIRMINGHAM TOWNSHIP	QA REVIEW	APPROVED BY	
SURVEYED BY / COMPUTED BY	PROJECT MANAGER: J. HATFIELD; DRAWN BY: D. KURULICH		
PROJECT NO.: 19190.80	FILE NO.: 36774-L	5 OF 7	REVISION: 2

LEGEND

- STORM SEWER W/OUTFALL
- STORMWATER MANAGEMENT FACILITY
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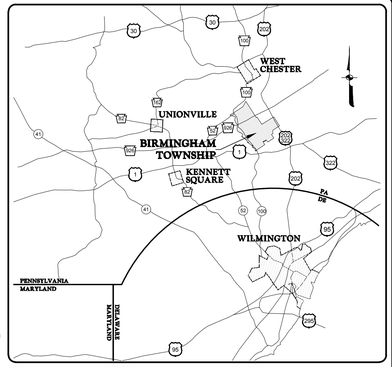

LOCATION PLAN NOT TO SCALE

MATCH SHEET 3

MATCH SHEET 4

SHEET 5

PENNSBURY TOWNSHIP

DELAWARE COUNTY

DILWORTHTOWN OAK ESTATES

SILVERWOOD

WOODSIDE

ROUNDELAY

RESERVE AT CHADDS FORD

BRINTON'S BRIDGE ROAD

BRINTON RUN

BRANDYWINE CREEK

BRANDYWINE RIVER

DEER CROSSING

PAGEANT DRIVE

SILVERWOOD DRIVE

ROUNDELAY DRIVE

HIDDEN VALLEY LANE

JOHNNY WAY

MASTERS WAY

ROSEWOOD LANE

CEDAR DRIVE

LAFAYETTE PLACE

WEBB ROAD

DRAFT FOR PUBLIC COMMENT

NO.	DATE	REVISION	BY	APPROVED
2	7/5/2017	ADDED DRAINAGE AREAS	NAC	JWH
1	08/22/07	STORMWATER MANAGEMENT FACILITIES ADDED	KDM	JWH

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PERMANENT FILE: BIRMINGHAM TOWNSHIP	QA REVIEW	APPROVED BY	
SURVEYED BY	PROJECT MANAGER: J. HATFIELD		
COMPUTED BY	DRAWN BY: D. KUKULICH		
PROJECT NO.: 19190.80	FILE NO.: 36774-L	6 OF 7	REVISION: 2

OUTLET LOCATION

NO.	PAGE	LOCATION	RECEIVING BODIES OF WATER	OWNERSHIP	NPDES PH.2 PERMIT (Y/N)
1	2	804 N. WASHINGTON RIDGE	PLUM RUN	TOWNSHIP	N
2	2	813 GENERAL CORNWALLIS DRIVE	PLUM RUN	TOWNSHIP	N
3	2	804 GENERAL STERLING DRIVE	RADLEY RUN	TOWNSHIP	Y
4	2	804 HESSIAN CIRCLE	BRANDYWINE RIVER	TOWNSHIP	N
5	2	816 HESSIAN CIRCLE	PLUM RUN	TOWNSHIP	N
6	2	1131 COUNTRY CLUB CRIVE	RRCC LAGOON	TOWNSHIP	N
7	2	1121 COUNTRY CLUB DRIVE	RRCC LAGOON	TOWNSHIP	N
8	2	1072 COUNTRY CLUB DRIVE	RADLEY RUN	TOWNSHIP	N
9	2	1070 COUNTRY CLUB DRIVE	RADLEY RUN	TOWNSHIP	N
10	2	1053 COUNTRY CLUB DRIVE	RADLEY RUN	TOWNSHIP	N
11	2	1121 INDEPENDENCE DRIVE	RADLEY RUN	HOA	N
12	2	1107 INDEPENDENCE DRIVE	RADLEY RUN	TOWNSHIP	N
13	2	1103 INDEPENDENCE DRIVE	RADLEY RUN	TOWNSHIP	N
14	2	1101 INDEPENDENCE DRIVE	RADLEY RUN	TOWNSHIP	Y
15	2	1007 MANSION VIEW DRIVE	RADLEY RUN	TOWNSHIP	N
16	2	1007 MANSION VIEW DRIVE	RADLEY RUN	TOWNSHIP	N
17	2	1005 MANSION VIEW DRIVE	RADLEY RUN	TOWNSHIP	N
18	2	1112 FORSYTH LANE	RADLEY RUN	TOWNSHIP	N
19	2	1007 GENERAL LAFAYETTE BLVD.	RADLEY RUN	TOWNSHIP	N
20	2	1000 LAKEVIEW DRIVE	RADLEY RUN	TOWNSHIP	N
21	2	1006 MATHER LANE	RADLEY RUN	TOWNSHIP	N
22	2	1006 SABER ROAD	RADLEY RUN	TOWNSHIP	N
23	2	1019 RADLEY DRIVE	RADLEY RUN	TOWNSHIP	N
24	2	1028 RADLEY DRIVE	RADLEY RUN	TOWNSHIP	N
25	2	1000 ARTILLERY POINT ROAD	RADLEY RUN	HOA	N
26	2	1003 LAMBOURNE ROAD	RADLEY RUN	PRIVATE	N
27	2	988 E. REGIMENTAL DRIVE	PLUM RUN	PRIVATE	N
28	2	909 GENERAL HOWE DRIVE	PLUM RUN	TOWNSHIP	Y
29	2	BIRMINGHAM RD. & RADLEY RUN	RADLEY RUN	PaDOT	N
30	2	989 WHITETAIL LANE	RADLEY RUN	HOA	N
31	2	934 STONEY RUN DRIVE	RADLEY RUN	HOA	N
32	2	1001 CEDAR MILL LANE	RADLEY RUN	TOWNSHIP	N
33	2	1061 CEDAR MILL LANE	RADLEY RUN	HOA	N
34	2	1125 ALEXANDER LANE	RADLEY RUN	HOA	N
35	2	1111 DANIEL DAVIS LANE	RADLEY RUN	PRIVATE	N
36	2	1013 REVOLUTIONARY DRIVE	RADLEY RUN S.	TOWNSHIP	N
37	3	1013 REVOLUTIONARY DRIVE	RADLEY RUN S.	TOWNSHIP	N
38	3	1021 REVOLUTIONARY DRIVE	RADLEY RUN S.	TOWNSHIP	N
39	3	1116 GENERAL LAFAYETTE BLVD.	RADLEY RUN S.	TOWNSHIP	Y
40	3	1108 RADLEY DRIVE	RADLEY RUN S.	TOWNSHIP	N
41	3	1101 SHERBROOKE DRIVE	RADLEY RUN S.	PaDOT	N
42	3	1101 SHERBROOKE DRIVE	RADLEY RUN S.	TOWNSHIP	N
43	3	1107 HAMPSHIRE PLACE	RADLEY RUN S.	TOWNSHIP	N
44	3	1111 SHERBROOKE DRIVE	RADLEY RUN S.	TOWNSHIP	N
45	3	1181 HAMPSHIRE PLACE	RADLEY RUN S.	TOWNSHIP	N
46	3	1149 DORSET DRIVE	RADLEY RUN S.	TOWNSHIP	N
47	3	1140 DORSET DRIVE	RADLEY RUN S.	TOWNSHIP	Y
48	3	1129 DORSET DRIVE	RADLEY RUN	TOWNSHIP	N
49	3	1121 DORSET DRIVE	RADLEY RUN	TOWNSHIP	Y
50	3	1111 DORSET DRIVE	RADLEY RUN	TOWNSHIP	Y
51	3	905 GENERAL WAYNE DRIVE	RADLEY RUN	TOWNSHIP	Y
52	3	913 GENERAL WAYNE DRIVE	RADLEY RUN	TOWNSHIP	Y
53	3	918 GENERAL WAYNE DRIVE	RADLEY RUN	TOWNSHIP	Y
54	3	1102 DORSET DRIVE	RADLEY RUN	TOWNSHIP	Y
55	3	1161 ARROWHEAD DRIVE	RADLEY RUN S.	HOA	N
56	3	1168 ARROWHEAD DRIVE	RENWICK RUN	HOA	N
57	3	1170 ARROWHEAD DRIVE	RENWICK RUN	HOA	N
58	3	1167 RENWICK DRIVE	RENWICK RUN	TOWNSHIP	N
59	3	1165 RENWICK DRIVE	RENWICK RUN	HOA	N
60	3	1025 MEETINGHOUSE ROAD	RENWICK RUN	TOWNSHIP	Y
61	3	1088 HEARTSEASE DRIVE	WYLIE RUN N.	HOA	N
62	3	1065 WYLIE ROAD	WYLIE RUN N.	PRIVATE	N
63	3	1065 WYLIE ROAD	WYLIE RUN N.	PaDOT	N
64	3	1065 WYLIE ROAD	WYLIE RUN N.	PaDOT	N

OUTLET LOCATION

NO.	PAGE	LOCATION	RECEIVING BODIES OF WATER	OWNERSHIP	NPDES PH.2 PERMIT (Y/N)
65	4	1065 HEARTSEASE DRIVE	WYLIE RUN N.	TOWNSHIP	N
66	4	145 FIRETHORNE DRIVE	WYLIE RUN N.	HOA	N
67	4	12 FIRETHORNE DRIVE	WYLIE RUN N.	TOWNSHIP	N
68	4	270 FIRETHORNE DRIVE	WYLIE RUN N.	TOWNSHIP	N
69	4	330 FIRETHORNE DRIVE	WYLIE RUN N.	HOA	N
70	4	811 PHEASANT RUN	WYLIE RUN S.	HOA	N
71	4	1324 CREST DRIVE	RADLEY RUN	TOWNSHIP	Y
72	4	668 KADAR DRIVE	BRINTON RUN	TOWNSHIP	Y
73	4	645 GENERAL WEEDON DRIVE	BRINTON RUN	TOWNSHIP	Y
74	4	643 GENERAL WEEDON DRIVE	BRINTON RUN	TOWNSHIP	Y
75	4	632 GENERAL WEEDON DRIVE	BRINTON RUN	TOWNSHIP	Y
76	4	620 GENERAL WEEDON DRIVE	BRINTON RUN	TOWNSHIP	Y
77	4	580 WINTURFORD DRIVE	BRINTON RUN	HOA	N
78	4	625 GENERAL WEEDON DRIVE	BRINTON RUN	TOWNSHIP	N
79	4	1347 FIELDPOINT DRIVE	BRINTON RUN	HOA	N
80	4	1316 FIELDPOINT DRIVE	WYLIE RUN N.	TOWNSHIP	Y
81	4	1304 FIELDPOINT DRIVE	WYLIE RUN N.	HOA	N
82	4	678 FARMSTEAD DRIVE	BRINTON RUN	TOWNSHIP	N
83	4	1368 BRINTON RUN DRIVE	RADLEY RUN	HOA	N
84	4	405 KNOLLS ROAD	RADLEY RUN	HOA	N
85	4	355 KNOLLS ROAD	RADLEY RUN	TOWNSHIP	Y
86A	4	340 LEA DRIVE	RADLEY RUN	TOWNSHIP	Y
86B	4	1321 LEA DRIVE	RADLEY RUN	TOWNSHIP	Y
86C	4	1315 LEA DRIVE	RADLEY RUN	TOWNSHIP	Y
86D	4	1293 SUMNER WAY	RADLEY RUN	TOWNSHIP	Y
87	4	310 LEA DRIVE	RADLEY RUN	TOWNSHIP	Y
88	4	301 LEA DRIVE	RADLEY RUN	TOWNSHIP	Y
89	4	430 SUMNER WAY	RADLEY RUN	HOA	N
90	4	924 ADAMS WAY	RADLEY RUN	HOA	N
91	4	732 HERITAGE DRIVE	RADLEY RUN	HOA	N
92	4	1023 ADAMS WAY	RADLEY RUN	HOA	N
93	4	1288 WILMINGTON PIKE	RADLEY RUN	TOWNSHIP	Y
94	4	1288 WILMINGTON PIKE	RADLEY RUN	TOWNSHIP	Y
95	4	1288 WILMINGTON PIKE	RADLEY RUN	TOWNSHIP	Y
96	4	1379 FAUCETT DRIVE	W. BR. CHESTER CR.	TOWNSHIP	N
97	5	845 DEER CROSSING	WYLIE RUN S.	TOWNSHIP	N
98	5	869 DEER CROSSING	WYLIE RUN S.	TOWNSHIP	Y
99	5	875 DEER CROSSING	WYLIE RUN S.	TOWNSHIP	Y
100	5	835 DEER CROSSING	WYLIE RUN S.	TOWNSHIP	Y
101	5	829 DEER CROSSING	WYLIE RUN S.	TOWNSHIP	Y
102	5	875 DEER CROSSING	WYLIE RUN S.	HOA	N
103	5	876 SILVERWOOD DRIVE	BRINTON RUN	HOA	N
104	5	872 PENNS WAY	BRINTON RUN	HOA	N
105	5	856 PENNS WAY	BRINTON RUN	TOWNSHIP	Y
106	5	678 KADAR DRIVE	BRINTON RUN	HOA	N
107	5	1826 MASTERS WAY	BRINTON RUN	HOA	N
108	5	1812 MASTERS WAY	BRANDYWINE RIVER	HOA	N
109	5	1708 ROSEWOOD LANE	BRANDYWINE RIVER	HOA	N
110	5	1612 MASTERS WAY	BRANDYWINE RIVER	HOA	N
111	5	MASTERS WAY & CREEK ROAD	BRANDYWINE RIVER	HOA	N
112	5	717 PHEASANT RUN	BRINTON RUN	HOA	N
113	5	11 LAFAYETTE PLACE	BRINTON RUN	TOWNSHIP	Y

BODIES OF WATER:
BRANDYWINE RIVER
BRINTON RUN
PLUM RUN
RADLEY RUN
RADLEY RUN S.
RENWICK RUN
RRCC LAGOON
WEST BRANCH CHESTER CREEK
WYLIE RUN N.
WYLIE RUN S.

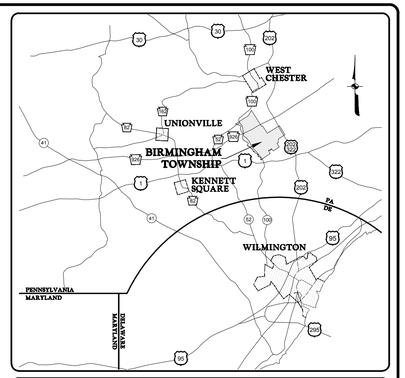
HOA: HOME OWNERS ASSOCIATION
PRIVATE: PRIVATE SYSTEM
TOWNSHIP: BIRMINGHAM TOWNSHIP
PaDOT: PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CHART OF STORMWATER BASINS

STORMWATER BASIN LOCATION

ID #	PA PROJECT NUMBER	NAME / SUBDIVISION	LOCATION	DESCRIPTION	OWNER / RESPONSIBLE PARTY
EB-1	896328	Roundabout	Roundabout Drive, House #90	Subsurface Bed	TOWNSHIP
EB-2	896334	Spring Meadows	Sorrell Drive between House #200 & #201	Retention Basin	HOA
EB-3	896328	Westfields	Northbrook Drive, rear of House #284 & #288	Retention Basin	HOA
EB-4	896327	Firethorne Estates	Firethorne Drive open space, north side of entrance	Retention Basin	HOA
EB-5	896327	Firethorne Estates	Firethorne Drive, rear of House #282 & #283	Retention Basin	HOA
EB-6	896328	Steerthrown Estates	Brinton Run Road, House #1268	Retention Basin	OWNER of House #1268
EB-7	896328	Radley Run Phase II	Independence Drive, House #220	Retention Basin	HOA
EB-8	896331	Woodside	Penns Way entrance open space (House #8781)	Retention Basin	HOA
EB-9	896332	Radley Run Phase III	Radley Drive, rear of House #1288 & #1292	Retention Basin	HOA
EB-10	896332	Radley Run Phase III	Nutter Lane, rear open space behind House #1287 & #1288	Retention Basin	HOA
EB-11	896325	Century Farms	Arrowhead Drive, entrance open space	Retention Basin	OWNER of House #1050 & #1068
EB-12	896325	Century Farms	Arrowhead Drive, rear of House #1066 & #1068	Retention Basin	OWNER of House #1066 & #1068
EB-13	896325	Century Farms	Arrowhead Drive, House #1078	Retention Basin	OWNER of House #1078
EB-14	896327	Keystone Honda (Acura)	1240 Wilmington Pike, SB Route 202, NW rear of lot	Subsurface Bed	OWNER of Establishment
EB-15	896327	Keystone Honda (Acura)	1240 Wilmington Pike, SB Route 202, SE side of lot	Subsurface Bed	OWNER of Establishment
EB-16	896328	Fair Meadows	Bartel Duck Drive, House #202	Retention Basin	OWNER of House #202
EB-17	896329	Dilliken Automotive	1290 Wilmington Pike, SB Route 202, rear of lot	Retention Basin	OWNER of Establishment
EB-18	896330	Silverwood	Silverwood Drive east open space behind House #870, #874 & #876	Retention Basin	HOA
EB-19	896329	Sheehy Ford	1220 Wilmington Pike, SB Route 202, open space at entrance	Retention Basin	OWNER of Establishment
EB-20	896329	Sheehy Ford	1220 Wilmington Pike, SB Route 202, open space at entrance	Retention Basin	OWNER of Establishment
EB-21	896326	Radley Run Phase IV	East Regiments Drive, House #988	Retention Basin	OWNER of House #988 (402) / HOA (551)
EB-22	896328	Brimington Hunt	Maine Way, southwest open space (#629)	Retention Basin	HOA
EB-23	896328	Brimington Hunt	Sumner Way, northern open space, (Open #630)	Retention Basin	HOA
EB-24	896328	Brimington Hunt	Open space behind Heritage Drive, House #730 & #732	Retention Basin	HOA
EB-25	896328	Reserve at Chadds Ford, Phase I	Masters Way entrance open space	Retention Basin	HOA
EB-26	896328	Reserve at Chadds Ford, Phase I	Masters Way behind House #1268, #1262 & #1258	Retention Basin	HOA
EB-27	896241	The Knolls of Birmingham	Open space next to Sumner Way, #430 Sumner Way	Retention Basin	HOA
EB-28	896241	The Knolls of Birmingham	Open space along Knolls Road	Retention Basin	HOA
EB-29	896244	Vernon Ford	1301 Wilmington Pike, NB Route 202	Subsurface Bed	OWNER of Establishment
EB-30	896245	Vyle Farm, Robert Kane	Continental Line Lane, House #6280	Retention Basin	OWNER of House #6285
EB-31	896245	Vyle Farm	Queen's Rangers Lane, #6277	Retention Basin	OWNER of House #6277
EB-32	896245	Vyle Farm	Queen's Rangers Lane, #6277	Retention Basin	OWNER of House #6275
EB-33	896245	Vyle Farm	Queen's Rangers Lane, #6281	Retention Basin	OWNER of House #6281
EB-34	896245	Vyle Farm	Queen's Rangers Lane, #6281	Retention Basin	OWNER of House #6283
EB-35	896245	Vyle Farm	Queen's Rangers Lane, #6285	Retention Basin	OWNER of House #6285
EB-36	896245	Vyle Farm	Queen's Rangers Lane, #6287	Retention Basin	OWNER of House #6287
EB-37	896245	Vyle Farm	Queen's Rangers Lane, #6289	Retention Basin	OWNER of House #6289
EB-38	896245	Vyle Farm	Continental Line, #6290	Retention Basin	OWNER of House #6290
EB-39	896245	Vyle Farm	Continental Line, #6292	Retention Basin	OWNER of House #6292
EB-40	896244	Hunton Place, Phase I	Alexander Lane, rear of House #6129	Retention Basin	HOA
EB-41	896244	Hunton Place, Phase I	Little Ridge Drive, #1285 & #1283	Retention Basin	HOA
EB-42	896244	Fernbank Farm	Country Club Drive, House #1225, rear of lot	Retention Basin	OWNER of House #1225
EB-43	896244	Fernbank Farm	Squire Downey Drive, House #2405, rear of lot	Retention Basin	OWNER of House #2405
EB-45	896172	Reserve at Chadds Ford, Phase II	Open space inside loop of Masters Way, between House #283 & #283	Retention Basin	HOA
EB-46	896172	Reserve at Chadds Ford, Phase II	Rosewood Lane, open space behind house #2764, #2765 & #2768	Retention Basin	HOA
EB-47	896172	Reserve at Chadds Ford, Phase II	Masters Way, open space behind house #2821 & #2824	Retention Basin	HOA
EB-48	896174	Willowforge	Open Space near House #1188	Subsurface Bed	OWNER of House #1188
EB-49	896179	Hunton Place, Phase III	Cedar Mill Lane, rear of #1001 & #1010	Retention Basin	HOA
EB-50	896180	Hunton Place, Phase III	White Tail Drive, rear of #1088 & #1090	Retention Basin	HOA
EB-51	896182	Hunton Place, Phase III	Stoney Run Drive, open space near entrance and rear of House #950	Retention Basin	HOA
EB-52	896349	Renwick	Renwick Drive, House #1005	Retention Basin	OWNER of House #1005
EB-53	896387	Regents At Brandywine	Meetinghouse Road, House #1090, corner of Meetinghouse Rd & Brimington Rd.	Retention Basin	OWNER of House #1090
EB-53-54	896388	Regents At Brandywine	Lot 2 of Renwick subdivision - Meetinghouse Road, House #1040	Retention / Infiltration Basin	OWNER of House #1040
EB-55	896635	Mall / On the Run	1351 Old Wilmington Pike, SB Route 202, open space near Old Wm. Pike	Retention Basin	OWNER of Establishment
EB-56	896635	Mall / On the Run	1301 Wilmington Pike, SB Route 202, under entrance at Old Wm. Pike	Retention Basin	OWNER of Establishment
EB-56-57	896350	Legacy Lane	Legacy Lane, open space near entrance & House #1200	Retention / Infiltration Basin	OWNER of House #1200
EB-58	896350	Legacy Lane	Legacy Lane, House #1208 & #1210	Subsurface Bed	OWNER of House #1208 & #1210
EB-59	896350	Legacy Lane	Legacy Lane, Markets 3, between House #1215 & #1217	Subsurface Bed	TOWNSHIP
EB-60	896349	Steerthrown Inn	1288 Old Wilmington Pike, west Parking lot near Old Wilmington Pike (Reserve parking)	Subsurface Bed	OWNER of Establishment
EB-61	896628	Steerthrown Inn	1315 Old Wilmington Pike, East Parking lot near Brinton's Bridge Road	Subsurface Bed	OWNER of Establishment
EB-62 EB-62-72	896628 896628	Steerthrown Inn Steerthrown Inn	1301 Wilmington Pike, SB Route 202, west rear of lot 1301 Wilmington Pike, SB Route 202, beneath entrance	Retention / Infiltration Basin Subsurface Bed	OWNER of Establishment OWNER of Establishment
EB-63	896628	Steerthrown Inn	1301 Wilmington Pike, SB Route 202, southwest parking lot	Subsurface Bed	OWNER of Establishment
EB-64	896628	Mercedes	1260 Wilmington Pike, SB Route 202, northwest parking lot	Subsurface Bed	OWNER of Establishment
EB-65	896628	Mercedes	1260 Wilmington Pike, SB Route 202, northeast parking lot	Subsurface Bed	OWNER of Establishment
EB-66	896631	Howard Harris, Lot 3 of James Subdivision	140 Creek Road, Intersection of Brinton's Bridge Rd & Creek Rd	Retention Basin	OWNER of House #140
EB-67	896628	Steerthrown Inn Estates	Pheasant Run, rear of House #773 & #777	Retention Basin	HOA
EB-68	896628	Steerthrown Inn Estates	Pheasant Run, rear of House #857 & #861	Retention Basin	HOA
EB-69	896628	Steerthrown Inn Estates	Open space between Deer Crossing & Pheasant Run	Retention Basin	HOA
EB-70	896631	Century Farms, Robert Kane	Continental Line Lane, House #6285	Subsurface Bed	OWNER of House #6285
EB-71	896631	Vyle Farm, Robert Kane	Continental Line Lane, House #6285	Subsurface Bed	OWNER of House #6285
EB-72	896635	Dilick's BMW	1275 Wilmington Pike, SB Route 202, open space near southern entrance	Retention Basin	OWNER of Establishment
FP-73	896635	Dilick's BMW	1275 Wilmington Pike, SB Route 202, north inventory parking lot	Porous Paving	OWNER of Establishment
EB-74	896635	Dilick's BMW	1275 Wilmington Pike, SB Route 202, north inventory parking lot	Subsurface Bed	OWNER of Establishment
EB-75-75	896662	Carol & Eric Nelsbet	295 W. Street Road, SE Route 926, behind House #264 & #266 of Century Farms (Unnamed Drive)	Retention / Infiltration Basin	OWNER of House #295
EB-76	896662	Carol & Eric Nelsbet	295 W. Street Road, SE Route 926, lot driveway	Subsurface Bed	OWNER of House #295
EB-77	896670	Pazzo Vert Dexter (Former site of Brandywine Hotel)	1320 Wilmington Pike, SB 202, open space near Route 202 & entrance	Retention Basin	OWNER of Establishment
EB-78	896670	Pazzo Vert Dexter (Former site of Brandywine Hotel)	1320 Wilmington Pike, SB 202, below entrance at Route 202	Subsurface Bed	OWNER of Establishment
EB-79	896670	Pazzo Vert Dexter (Former site of Brandywine Hotel)	1320 Wilmington Pike, SB 202, below entrance at Route 202	Subsurface Bed	OWNER of Establishment
EB-80	896672	Roundway Associates	1470 Creek Road, Rear of House #917 of Roundway 33	Subsurface Bed	OWNER of Establishment
EB-81	896672	Roundway Associates	1470 Creek Road, Rear of House #917 of Roundway 33	Subsurface Bed	OWNER of Establishment

KEY:
EB Retention Basin
EB-R Retention / Infiltration Basin
FP Porous Paving
SB Subsurface Bed



STORMWATER MANAGEMENT FACILITIES INVENTORY MAP

FOR

BIRMINGHAM TOWNSHIP

SCALE: 1"=900' FEBRUARY 19, 2004

0 450 900 1800

GRAPHIC SCALE (FEET)

NO.	DATE	REVISION	BY	APPROVED
2	7/5/2017	ADDED DRAINAGE AREAS	NAC	JVH
1	08/22/07	STORMWATER MANAGEMENT FACILITIES ADDED	KDM	JVH

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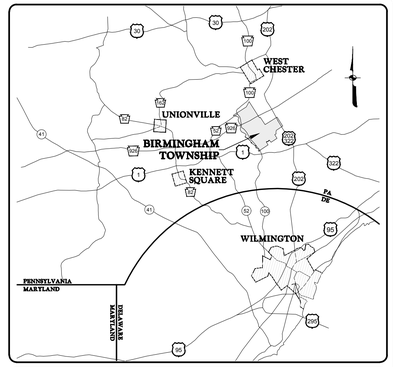
VANDEMARK & LYNCH, INC.
ENGINEERS – PLANNERS – SURVEYORS
4305 MILLER RD./PO BOX 2047
WILMINGTON, DE 19899/(302) 764-7635

PERMANENT FILE: BIRMINGHAM TOWNSHIP	QA REVIEW	APPROVED BY	
SURVEYED BY	PROJECT MANAGER: J. HATFIELD		
COMPUTED BY	DRAWN BY: D. KUKULICH / K. MAGUIGAN		
PROJECT NO.: 19190.80	FILE NO.: 36774-L	7 OF 7	REVISION: 2



LOCATION PLAN NOT TO SCALE

PROPOSED 11,000 CF BASIN RETROFIT

PROPOSED 14,000 CF BASIN RETROFIT

PROPOSED 11,000 CF BASIN RETROFIT

PROPOSED 1,100 CF BASIN RETROFIT

PROPOSED 10,000 CF BASIN RETROFIT

PROPOSED 3,500 CF BASIN RETROFIT

PROPOSED 7,700 CF BASIN RETROFIT

TO CHESTER CREEK

TO CHESTER CREEK

EAST BRADFORD TOWNSHIP

WESTTOWN TOWNSHIP

THORNBURY TOWNSHIP

THORNBURY TOWNSHIP

POCOPSON TOWNSHIP

PENNSBURY TOWNSHIP

DELAWARE COUNTY

B15

B16

B15

B16

B15

B16

B15

B16

RADLEY RUN

ASHWELL

HAMILTON PLACE

FAIR MEADOWS

SPRING MEADOWS

CENTURY FARMS

RENWICK

BIRMINGHAM ESTATES

BIRMINGHAM HUNT

THE KNOLLS OF BIRMINGHAM

DILWORTHTOWN ESTATES

FIELDPOINT

FIRETHORNE

HEARTSEASE

WYLIE TRACT

WYLIE FARMS

DILWORTHTOWN OAK ESTATES

HERITAGE FARMS

WINTURFORD

SILVERWOOD

WOODSIDE

ROUNDELAY

RESERVE AT CHADDS FORD

DRAFT FOR PUBLIC COMMENT

PROPOSED BMPs TO ADDRESS TMDL REQUIREMENTS

BIRMINGHAM TOWNSHIP

SCALE: 1"=900' JULY 07, 2017

900 0 450 900 1800 3600

GRAPHIC SCALE (FEET)

NO.	DATE	REVISION	BY	APPROVED
				JVH

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SURVEYED BY	PROJECT MANAGER: J. HATFIELD	
COMPUTED BY	DRAWN BY: N. CARLSON	
PROJECT NO. 19190.80	FILE NO. 19190.80-EXHIB-03	1 OF 1 — REVISION