



Pollutant Reduction Plan

West Branch Brandywine Creek

September 11, 2017

Updated September 2018

Prepared For:

Caln Township

Chester County, PA
253 Municipal Drive
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Prepared By:



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1.0 Purpose and Scope

Caln Township is required to develop and implement a Pollutant Reduction Plan (PRP) for Municipal Separate Storm Sewer System (MS4) discharges to West Branch Brandywine Creek as part of the 2018 National Pollutant Discharge Elimination System (NPDES) MS4 General Permit Notice of Intent filing to the Pennsylvania Department of Environmental Protection (PA DEP). This plan has been prepared based on the best and most current guidance made available by PA DEP. Definitions of relevant regulatory terms have been provided in Section 6.0 of this report.

2.0 Permit Requirements

To develop a PRP, it is important to have an understanding of the Township’s requirements. Caln Township is required by the PA DEP and United States Environmental Protection Agency (EPA) to reduce sediment and nutrient pollution from stormwater discharges to surface waters impaired by sediment by ten (10) percent and nutrients [Total Phosphorous (TP)] by five (5) percent within five (5) years of the PA DEP approval date of this Pollutant Reduction Plan (PRP), by implementing projects or Best Management Practices (BMPs).

Caln has MS4 discharges or “outfalls” to unnamed tributaries (UNTs) to West Branch Brandywine Creek, which flow to the impaired downstream waters of the West Branch Brandywine Creek. The West Branch Brandywine Creek is listed by the 2014 Pennsylvania Integrated Water Quality Monitoring and Assessment Report (Integrated Report) as impaired for siltation (i.e. sediment), nutrients, and PCBs as highlighted in Table 1 below.

Table 1: MS4 Requirements Table (Municipal) Excerpt (last revised 6/26/17)

MS4 Name	NPDES ID	Individual Permit Required?	Reason	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment
Caln Township	PAG130053	No		Beaver Creek		Cause Unknown (4a), Other Habitat Alterations, Water/Flow Variability (4c)
				UNT to West Branch Brandywine Creek		Cause Unknown (4a)
				West Branch Brandywine Creek	Appendix C-PCB (4a), Appendix E-Nutrients, Siltation (4a)	Water/Flow Variability (4c)
				East Branch Brandywine Creek		Cause Unknown (4a), Other Habitat Alterations, Water/Flow Variability (4c)

Caln Township is required to reduce the sediment loading to the UNTs to West Branch Brandywine Creek by ten (10) percent and TP by five (5) percent within five (5) years of the PA DEP approval date of this Pollutant Reduction Plan (PRP).

3.0 Background/Setting

Caln Township comprises approximately 8.8 square miles located near the center of Chester County, in southeast Pennsylvania. The 2010 Urbanized Area (U.S. Census Bureau) covers 100 percent of the land area of the Township.

Figure 1: Caln Township Location Map

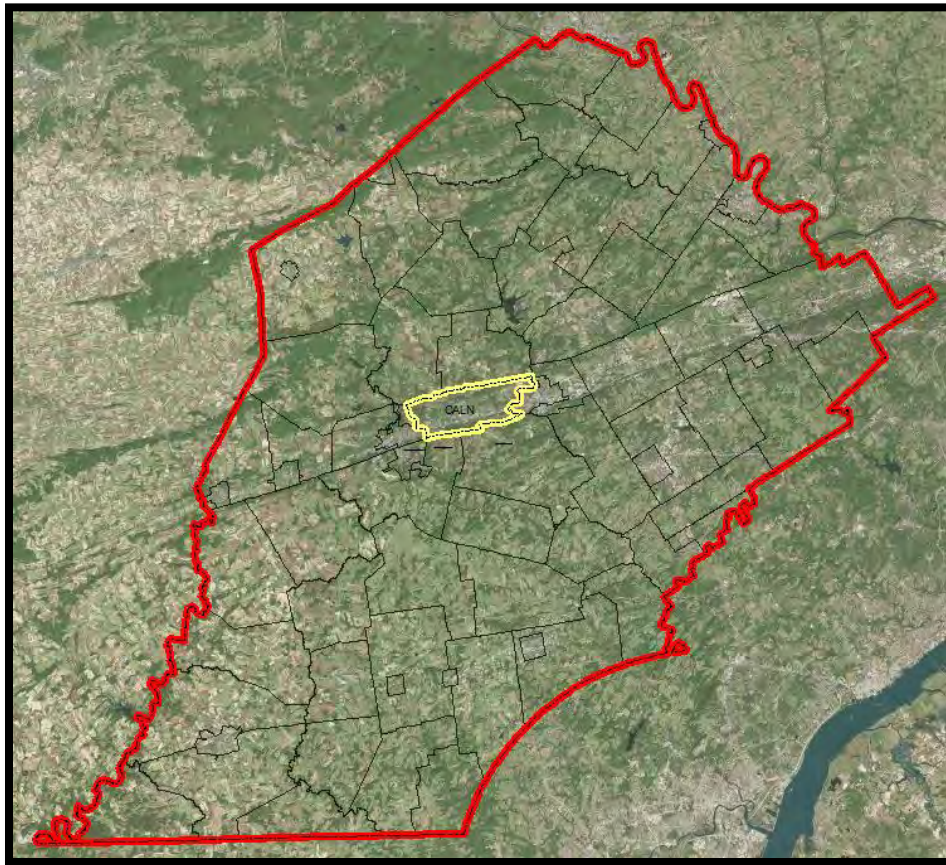
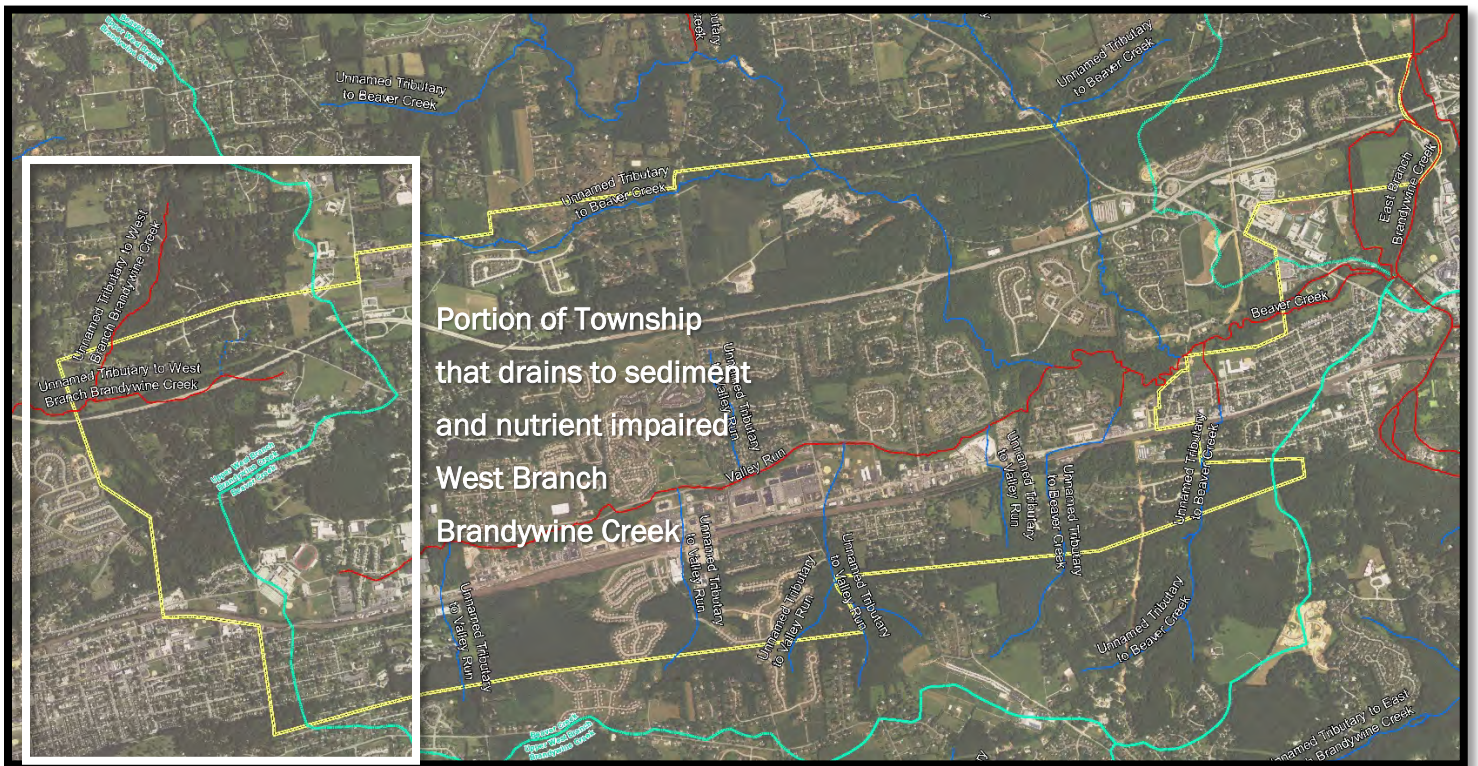


Figure 2 below displays a map of the streams that flow through Caln Township along with the Hydrologic Unit Code (HUC) 12 watershed boundary in turquoise. Stream segments colored red indicate impaired portions of streams. A total of thirteen (13) MS4 outfalls discharge to the impaired portions of UNTs to West Branch Brandywine Creek.

Figure 2: Caln Township Impaired Streams



3.1 West Branch Brandywine Creek

Within Caln Township, the UNTs to West Branch Brandywine Creek are located in the northwest corner of the township and flow in a west/southwesterly direction into Valley Township, the City of Coatesville, then into the West Branch Brandywine Creek. The UNTs themselves are not listed as impaired for sediment or nutrients. However, the West Branch Brandywine Creek is listed as impaired for sediment and nutrients within 5 miles downstream of Caln Township’s most downstream outfall, and therefore, the Township is required to develop a PRP. Table 2 below lists the impairment information of the West Branch Brandywine Creek from the 2014 Integrated Report within 5 miles downstream of Caln Township’s most downstream outfall.

There are thirteen (13) MS4 outfalls that discharge to the section of the UNTs of West Branch Brandywine Creek. Refer to Appendices for MS4 mapping.

Table 2: 2014 Integrated Report – West Branch Brandywine Creek (5 miles downstream)

Impairment Cause	Impairment Source	Category	Assessed Use	Date Listed
Water/Flow Variability	Urban Runoff/Storm Sewers	4c	Aquatic Life	2010
Siltation	Urban Runoff/Storm Sewers	4a	Aquatic Life	2010
PCB	Source Unknown	4a	Fish Consumption	1996
Siltation	Agriculture	4a	Aquatic Life	2002
Nutrients	Agriculture	4a	Aquatic Life	1996

4.0 Pollutant Reduction

Per the MS4 permit and PRP Instructions document (3800-PM-BCW0100k Rev. 3/2017), the following sections are addressed and described below: Public Participation, Storm Sewersheds, Pollutants of Concern, Existing Sediment Loading, Proposed Best Management Practices (BMPs), Funding Mechanisms, and Operations and Maintenance.

4.1 Public Participation

The PRP was updated in September 2018 to address comments received from the PA DEP in a letter dated January 18, 2018. The proposed BMP has changed as a result of addressing these comments. The Township plans to go through the required public participation process once the updated PRP is approved by PA DEP. Once complete, documentation will be forwarded to PA DEP under separate cover.

Caln Township made the original submission PRP available to the public to review and provide comment for thirty (30) days, initiated by a public notice published on August 31, 2017 in the Daily Local News. A copy of the public notice published in the Daily Local News is in Appendix A.

The PRP was presented at the Stormwater Advisory Committee meeting on July 24, 2017 and at a Board of Commissioners meeting on August 10, 2017. A PRP status update was also presented at a Board of Commissioners on August 9, 2018. Comments were accepted at this meeting from any interested members of the public. No written comments were received. Any verbal comments received at the Board of Commissioners meeting are documented in the meeting minutes in Appendix A.

4.2 Storm Sewersheds

Storm sewersheds that drain to each of the thirteen (13) outfalls, the additional planning area added in for the proposed BMP, and the planning area that drains into neighboring municipalities were manually delineated in ArcMap 10.5 using two (2) foot topographic contours from the 2006-2008 PAMAP Program data published by the Pennsylvania Department of Conservation and Natural Resources (DCNR), while referencing Google Street View and multiple sources of aerial imagery. The terms “Storm Sewershed” and “Planning Area” will be used interchangeably throughout this report.

“Parsing” is defined by the PRP Instructions Attachment A, entitled “Parsing Guidelines for MS4s in Pollutant Reduction Plans”, as a “process in which land area is removed from a Planning Area in order to calculate the actual or target pollutant loads that are applicable to an MS4.” The examples cited include:

- 1) The land area associated with non-municipal stormwater NPDES permit coverage that exists within the urbanized area of a municipality;

- 2) Land area associated with PennDOT roadways and the Pennsylvania Turnpike (roads and right of ways);
- 3) Lands associated with the production area of a Concentrated Animal Feeding Operation that is covered by an NPDES permit;
- 4) Land areas in which stormwater runoff does not enter the MS4. If an accurate storm sewershed map is developed, these lands may be parsed or excluded as part of that process.

Land areas that have been parsed from the Planning Area during the development of this PRP fall under categories #2 and #4 as describe above. These parsed areas have been categorized and identified on the Storm Sewershed Map in Appendix E.

Conversely, because the proposed BMP is located outside of the Planning Area, the drainage area to this BMP was added to the Planning Area (i.e. Stream Restoration).

The following table (Table 3) includes a list of outfalls and the associated storm sewershed acreage that drain to each outfall. Also listed is the receiving water for each outfall and United States Geological Survey (USGS) National Hydrography Dataset (NHD) Hydrologic Unit Code (HUC) 12 watershed.

Table 3: Storm Sewershed Acreage by Outfall

Receiving Water	HUC 12	Outfall Number	Storm Sewershed (acres)
UNT to West Branch Brandywine Creek	West Branch Brandywine Creek	1A	60.17
		2A	10.85
		3A	29.78
		4A	41.78
		5A	0.24
		6A	15.55
		7A	4.12
		8A	5.93
		116	6.74
		119	47.95
		120	10.42
		121	2.38
		122	22.44
		Drains to Neighboring Twp	2.55
		Drains to Neighboring Twp	0.93
		Drains to Neighboring Twp	60.28
		Drains to Neighboring Twp	32.79
		Drains to Neighboring Twp	39.76
Stream Restoration	34.03		
TOTAL:			428.69

4.3 Pollutants of Concern

There are two (2) pollutants of concern that Caln Township is required to address: sediment (TSS) and nutrients (TP). To meet the requirements, a minimum ten (10) percent sediment and five (5) percent TP reduction has been demonstrated.

Per the MS4 permit and PRP Instructions document (3800-PM-BCW0100k Rev. 3/2017), “PRPs may use a presumptive approach in which it is assumed that a 10% sediment reduction will also accomplish a 5% TP reduction.” Therefore, a minimum of ten (10) percent sediment reduction is what is needed to meet the requirements. Though not required, existing loading and BMP reduction calculations were also provided for nitrogen (TN) (Appendix C).

4.4 Existing Pollutant Loading

To determine existing pollutant loading to West Branch Brandywine Creek, the general methodology described in the DEP guidance document entitled “Pollution Reduction Plan: A Methodology” was utilized.

Per the “Pollutant Aggregation Suggestions for MS4 Requirements Table Instructions” (dated April 4, 2017) and the “Pollutant Aggregation Suggestions for MS4 Requirements Table (Municipal)” (revised April 25, 2017), Caln may achieve the ten (10) percent sediment pollutant reduction across the entire Planning Area, as opposed to a ten (10) percent reduction in the Planning Areas for each receiving impaired surface water.

Utilizing ArcGIS 10.5, 2011 National Land Cover Dataset (NLCD) data, the acreage of each land cover classification type within the storm sewersheds was calculated. The aggregate NLCD statistics within the planning area for the impaired receiving water are compiled below with a breakdown of the area by land cover classification type. Refer to Appendix F for the Land Cover Map.

Table 4: NLCD 2011 Land Cover to Impervious/Pervious Conversion

Receiving Waters Impaired by Sediment	HUC 12	HUC 10	Number of Storm Sewersheds	NLCD 2011 Land Cover within Storm Sewersheds	Planning Area ¹ (acres)	Percent Impervious	Impervious Area (acres)	Pervious Area (acres)
UNTs to West Branch Brandywine Creek	West Branch Brandywine Creek	West Branch Brandywine Creek	19	Developed, Open Space	112.85	19	21.44	91.41
				Developed, Low Intensity	70.61	49	34.60	36.01
				Developed, Medium Intensity	17.72	79	14.00	3.72
				Developed, High Intensity	4.70	100	4.70	
				Pasture/Hay	30.05	0	-	30.05
				Cultivated Crops	8.19	0	-	8.19
				Shrub/Scrub	35.29	0	-	35.29
				Grasslands/Herbaceous	0.04	0	-	0.04
				Deciduous Forest	148.54	0	-	148.54
				Evergreen Forest	0.71	0	-	0.71
TOTAL:					428.70		74.74	353.96

¹Planning Area acreage is greater than storm sewershed acreage because the selected proposed BMP is located outside of the storm sewershed boundary, and was therefore added to the Planning Area as required to determine existing loading.

“Developed” land cover classifications were then converted to percent impervious coverage based on the NLCD 2011 definitions. The impervious percentages used are as follows:

- Developed, Open Space – 19% impervious
- Developed, Low Intensity – 49% impervious
- Developed, Medium Intensity – 79% impervious
- Developed, High Intensity – 100% impervious

All other land cover classifications were assumed to be 100 percent pervious. The “Developed Land Loading Rates for PA Counties” (Attachment B of the PRP Instructions) for Chester County were then applied for impervious developed and pervious developed. This table is attached as Appendix B.

The existing sediment and phosphorous loading quantified from the entire Planning Area was 177,992.33 and 236.55 lbs/yr, respectively. A more detailed breakdown is in Table 5 below. Please refer to Appendix D for supporting calculations

Table 5: Existing Sediment Loading for Stormwater Outfalls to Sediment Impaired Streams

Receiving Waters Impaired by Sediment	Category	Area (ac)	TSS [Sediment] (lbs/yr)	TP [Phosphorous] (lbs/yr)
West Branch Brandywine Creek	Impervious, Developed	74.74	112467.26	109.12
	Pervious, Developed	353.96	65525.08	127.43
SUBTOTAL:			177,992.33	236.55
Existing BMP Reduction:			7,481.03	6.05
TOTAL:			170,511.30	230.50
Required Reduction			17,051.31	11.53

Four (4) existing BMPs were credited to reduce the existing sediment loading. Each BMP is described below and summarized in Table 7. Please refer to Appendix D for supporting calculations and the Storm Sewershed Map in Appendix E for BMP locations.

Kingswood Basin

This extended detention basin is located in the Kingswood Crossing development, north of E Kings Hwy and west of Kingswood Lane. The basin is associated with Outfall #121, is functioning, and is operated and maintained by the property owners, Thomas and Yong Davidson. Refer to the photograph below as documentation.



Millwood Basin

This extended detention basin is located in the Kingswood Crossing development, north of E Kings Hwy and west of the cul de sac at the end of Millwood Lane. The basin is associated with Outfall #120, is functioning, and is operated and maintained by the property owners, Robert and Suzanna Crouch. Refer to the photograph below as documentation.



VA Medical Center Infiltration Trench

This infiltration trench is located on the Coatesville Veterans Affairs Medical Center grounds off north of Blackhorse Hill Road. The infiltration trench is associated with Outfall #1A, is functioning, and is

operated and maintained by Coatesville VA Medical Center. Refer to the photograph below as documentation.



CMR Residential Subdivision Bioswale

This bioswale is located on the east side of Colins Way, north of Kings Highway. The bioswale is associated with Outfall #1A, is functioning, and is operated and maintained by the property owner, Mark Hargraves. Refer to the photograph below as documentation.



Table 7: Existing BMP Sediment Reduction

BMP Name	Drainage Area (ac)	TSS [Sediment] Reduction	TP [Phosphorus] Reduction
		lbs/yr	lbs/yr
Kingswood Basin	2.38	519.23	0.24
VA Medical Center Infiltration Trench	5.42	3,348.08	3.44
Millwood Basin	10.43	2,637.48	1.16
CMR Residential Subdivision Bioswale	2.90	976.24	1.21
TOTAL:	21.13	7,481.03	6.05

4.5 Proposed Best Management Practices (BMPs)

Caln Township proposes to meet the required ten (10) percent sediment and five (5) percent phosphorous load reduction for West Branch Brandywine Creek by implementing one (1) BMP within the Planning Area during the five (5) year permit term, a stream restoration project along an unnamed tributary to West Branch Brandywine Creek.

The stream restoration project proposed is located in the southwest quadrant of the intersection of Kings Highway (Route 340) and Moore Road. A map of the proposed BMP and its drainage area is in Appendix D. The BMP location is also illustrated on the Storm Sewershed/Planning Area Map in Appendix E and the Land Cover Map in Appendix F.

The proposed BMP was identified by analyzing the most fiscally responsible solutions that will provide a water quality improvement and real-world benefit, while meeting the mandated pollutant reduction requirements. This analysis was performed in ArcMap 10.5 using aerial imagery, two (2)-foot topographic contours, and hydrologic data. Site visits were conducted to verify project viability and collect information and measurements of existing BMPs where applicable.

Existing BMPs on Township-owned property within the Planning Area were assessed for retrofit, then new BMPs on Township-owned property within the Planning Area were explored. As there were no viable retrofit or new projects on Township-owned property identified within the Planning Area, a project on private property was explored. The Unnamed Tributary to the West Branch Brandywine Stream Restoration project was identified as the most viable option. The proposed BMP was located to reduce pollutant loading to the maximum extent practicable. The drainage area to the proposed stream restoration project was added to the Planning Area and incorporated into the existing pollutant loading.

Pollutant reductions resulting from the proposed BMP were quantified using the same methodology described above for existing sediment loading with the drainage area for the BMP. Reductions from the stream restoration were calculated using the methodology in the “Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects” (December 17, 2012). Please refer to Appendix C for supporting calculations. Calculations for nitrogen loading have also been provided, though not required.

Sediment and phosphorous load reductions achieved through the proposed implementation of the BMP are located in Table 6 below. A total sediment reduction of 10.5 percent and a total phosphorous reduction of 11.8 percent have been achieved, exceeding the minimum requirements of ten (10) and five (5) percent, respectively.

Table 6: Load Reductions from Proposed BMPs

Receiving Waters Impaired By Sediment	BMP Name	Drainage Area (ac)	TSS Reduction			TP Reduction		
			lbs/yr	% Reduction	% of Required Reduction	lbs/yr	% Reduction	% of Required Reduction
West Branch Brandywine Creek	UNT to W. Branch Brandywine Creek Stream Restoration (400 LF)	59.15	17,952	10.5	105	27.20	11.8	236

The proposed BMP is described in more detail below.

Unnamed Tributary to West Branch Brandywine Stream Restoration

A minimum of 400 linear feet of stream restoration is proposed along an unnamed tributary (UNT) to West Branch Brandywine Creek on a property currently owned by Jane and Alray Johnson. A portion of the project extends to the south onto an adjacent property currently owned by Daniel and Kelly Johnson.

This reach of stream is eroded and actively incising. Some of the drainage area to the proposed project location was already included in the Planning Area. The portions of the drainage area to the proposed stream restoration project location that were not included in the Planning Area were added. Therefore, the existing pollutant load reflects the entire drainage area to the proposed project location within the Township boundary.

This stream restoration project will meet the qualifying criteria outlined in the document published by PA DEP on June 22, 2017 entitled “Considerations of Stream Restoration Projects in Pennsylvania for eligibility as an MS4 Best Management Practice”. A feasibility study will be conducted to identify specific design recommendations, ideal project length, and potential project partners.

4.6 Funding Mechanisms

The funding mechanisms and estimated costs for the implementation of the proposed BMP are included in Table 7. The costs provided are conceptual, to be utilized for preliminary planning purposes only, and subject to change. If the linear feet of the UNT to West Branch Brandywine Creek stream restoration project increases, the total estimated cost will increase. It is anticipated that Caln Township will be funding all proposed BMPs unless grant money is secured.

Table 7: Proposed BMP Funding Mechanisms

Proposed BMP	Property Owner	Funding Mechanism	Estimated Design Cost ¹	Estimated Construction Cost ²	Total Estimated Cost
UNT to W. Branch Brandywine Creek Stream Restoration	Jane and Alray Johnson; Daniel and Kelly Hughes	Caln Township	\$82,500	\$192,500	\$275,000

¹Estimated Design Cost includes survey, design, engineering, any anticipated permitting, bid administration, and construction inspection. Developed based on 2018 costs/rates.

²Estimated Construction Cost includes construction, materials, and as-built survey. Developed based on 2018 costs/rates. It does NOT include costs associated with operations and maintenance (O&M).

4.7 Operations and Maintenance

To ensure the long-term effectiveness of this proposed BMP, operation and maintenance (O&M) is crucial. The chart below (Table 8) outlines the responsible party and the necessary O&M practices required for the proposed BMP (Pennsylvania Stormwater BMP Manual, December 30, 2006).

Table 8: Proposed BMP O&M Responsibilities

Proposed BMP	Property Owner	Responsible Party for O&M	O&M Responsibilities
UNT to W. Branch Brandywine Creek Stream Restoration	Jane and Alray Johnson; Daniel and Kelly Hughes	Caln Township	<ul style="list-style-type: none"> • Inspect at least 2x per year • Avoid excess use of fertilizers, pesticides, or other chemicals • Mow surrounding area as appropriate (remove clippings) • Remove invasive species • Remove debris

5.0 Conclusion

The required ten (10) percent sediment and five (5) percent phosphorous reductions have been achieved through the proposed implementation of the Unnamed Tributary to West Branch Brandywine Creek Stream Restoration project. The BMP will be implemented within five (5) years of the PA DEP approval date of this Pollutant Reduction Plan (PRP).

6.0 Definitions

Best Management Practices (BMPs): Schedules of activities, prohibitions of practices, structural controls (e.g., infiltration trenches), design criteria, maintenance procedures, and other management practices to prevent or reduce pollution to the waters of the Commonwealth. BMPs include Erosion and Sedimentation Control Plans, Post Construction Stormwater Management Plans, MS4 TMDL Plans, Stormwater Management Act Plans, and other treatment requirements, operating procedures and practices to control runoff, spillage or leaks, sludge or waste disposal, drainage from raw material storage, and methods to reduce pollution, to recharge groundwater, to enhance stream base flow and to reduce the threat of flooding and stream bank erosion. [NPDES Stormwater Discharges from Small MS4s General Permit 5/2016 (PAG-13)]

Municipal Separate Storm Sewer System (MS4): All separate storm sewers that are defined as “large” or “medium” or “small” municipal separate storm sewer systems pursuant to 40 CFR §§ 122.26(b)(18), or designated as regulated under 40 CFR § 122.26(a)(1)(v). [PAG-13]

National Pollutant Discharge Elimination System (NPDES): A permit issued under 25 Pa. Code Chapter 92a (relating to National Pollutant Discharge Elimination System permitting, monitoring and compliance) for the discharge or potential discharge of pollutants from a point source to surface waters. [PAG-13]

Outfall: A “Point Source” as defined by 40 CFR § 122.2 is the point where an MS4 discharges stormwater to other surface waters of this Commonwealth. This does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream and are used to convey waters of the Commonwealth (40 CFR § 122.26 (b) (9)). [PAG-13]

Owner or operator: The owner or operator of any “facility” or “activity” subject to regulation under the NPDES program. [PAG-13]’

Parsing: A process in which land area is removed from a Planning Area in order to calculate the actual or target pollutant loads that are applicable to an MS4. [NPDES from Small MS4 PRP Instructions- Attachment A]

Planning Area: All of the storm sewersheds that an MS4 must calculate existing loads and plan load reductions for. [NPDES from Small MS4 PRP Instructions]

Point Source: A discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, Concentrated Aquatic Animal Production Facility (CAAP), Concentrated Animal Feeding Operation (CAFO), landfill leachate

collection system, or vessel or other floating craft from which pollutants are or may be discharged. (25 Pa. Code § 92a.2). [PAG-13]

Pollutant: Any contaminant or other alteration of the physical, chemical, biological, or radiological integrity of surface water which causes or has the potential to cause pollution as defined in section 1 of The Clean Streams Law, 35 P.S. § 691.1. [PAG-13]

Storm Sewershed: The catchment area that drains into the storm sewer system based on the surface topography in the area served by the storm sewer. (Source: NPDES Stormwater Discharges from Small MS4s General Permit [PAG-13])

Stormwater: Runoff from precipitation, snow melt runoff and surface runoff and drainage. “Stormwater” has the same meaning as “Storm Water.” (Source: NPDES Stormwater Discharges from Small MS4s General Permit [PAG-13])

Urbanized Area (UA): Land area comprising one or more places (central place(s)) and the adjacent densely settled surrounding area (urban fringe) that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile, as defined by the United States Bureau of the Census and as determined by the latest available decennial census. The UA outlines the extent of automatically regulated areas. UA maps are available at: <http://www.epa.gov/npdes/stormwater/urbanmaps>, or at: <http://www.epa.gov/enviro/html/em/index.html>. [PAG-13]

Appendix A

Public Comment and Responses

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PUBLIC NOTICE

The Caln Township Pollutant Reduction Plan for the West Branch Brandywine Creek is available for public review on the Township website at <http://www.calntownship.org/> and by request at the Township Building at 253 Municipal Drive, Thorndale, PA 19372. Written comments from the public will be accepted for a period of 30 days from the date of this public notice. The Pollutant Reduction Plan describes proposed measures to be taken to reduce sediment and nutrient pollution to the West Branch Brandywine Creek within Caln Township and is a requirement of the Borough's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit.
dln. 8/31 - 1a.

CALN TOWNSHIP

Published in the following edition(s):

Daily Local News 08/31/17
Daily Local News Digital 08/31/17

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[Click here to download a copy of the Township's Pollutant Reduction Plan \(PDF\) \(/uploads/9/9/7/5/99755464/caln_township_pollutant_reduction_plan.pdf\)](#)

Caln Township is required to submit a Pollutant Reduction Plan to the DEP. The plan details projects that will reduce the stormwater discharge of nutrients and/or sediment into specified local waterways.

This Pollutant Reduction Plan is available for public viewing here at Calntownship.org or in person at the Township offices at 253 Municipal Dr. Thorndale, PA 19372. Public comments on the plan are welcome until August 25th, 2017 and should be directed to:

Kristen Denne, Township Manager
Email: kdenne@calntownship.org
Phone: 610-384-0600 x114

Comments will also be accepted at the Caln Township Board of Commissioners meeting on August 10th, 2017 at 7:30 pm.

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[June 2017 \(/news/archives/06-2017\)](/news/archives/06-2017)

[May 2017 \(/news/archives/05-2017\)](/news/archives/05-2017)

[April 2017 \(/news/archives/04-2017\)](/news/archives/04-2017)

[March 2017 \(/news/archives/03-2017\)](/news/archives/03-2017)

[January 2017 \(/news/archives/01-2017\)](/news/archives/01-2017)

[December 2016 \(/news/archives/12-2016\)](/news/archives/12-2016)

Call to order and pledge of allegiance.

Attendance – Jennifer Breton-President, George Chambers-Vice President, John Contento-Commissioner, Kristen Denne-Township Manager, Kristin Camp-Township Solicitor, Carol Schuehler-Township Engineer and Jennifer Schwed-Recording Secretary.

Absent– Joshua Young-Commissioner, Chuck Kramer-Commissioner, Chuck Wilson-Township Treasurer

Citizens to be heard

6 Caln Township residents including: Abram and Linda Morris of 29&31 Quarry St., Vivian Reeves of 43 Johnson Ave., Elnora Taylor of 46 Toth Ave., Joy Marz of 21 Quarry St., and Thomas Walker of 12 Fox Ave. (residents of Brandywine Homes) addressed concerns associated with the vacant property located at 5 Fox Ave., Coatesville. Concerns included the long-term vacancy, overgrown vegetation, and the state of disrepair posing a hazard to residents. Township Manager Denne noted that she is aware of the property and had walked the property the week prior. Township Solicitor Camp noted she also is aware of the property and explained that the title owner has not been located. Solicitor Camp and Commissioner Contento agreed that the title owner of the property must be located in order to enforce codes violations. Ms. Denne notified the residents of an appointment scheduled to come to the property on Tuesday, August 15th at 9:30 a.m. accompanied by essential township personnel. The residents also requested assistance with Eagle Disposal. Complaints included leaving waste receptacles in the road and not fully removing the garbage on various occasions. Commissioner Contento advised the residents to contact the township and request Scot Gill at extension 147 for waste removal concerns. A final complaint was noted for work trucks with attached trailers parking on Johnson Ave. that limit the flow of traffic for the residents in the Brandywine Homes development. Ms. Denne said she will investigate the problem further at the appointment made for Tuesday, August 15th.

Rick Urban of 54 Carlson Way (Beaver Run) expressed concern of the timing of the traffic light located at Lloyd and Manor Ave., the condition of Lloyd Ave. after being patched from a sewer project, flooding occurring after rain on Lloyd Ave. around a new storm drain and the status of a fire hydrant located at Carlson and Beaver Run Rd. Township Manager Denne agreed that the traffic light will need to be recalibrated. She stated she will have the storm drain cleared. She agreed to further investigate the sewer repair patch work on Lloyd Ave. and the status of the fire hydrant. Mr. Urban provided his contact information to Ms. Denne.

Nathan Lentz of 7 Joseph Ct. expressed concern over the same issues as Mr. Urban as a resident of the Beaver Run development. He also requested that sidewalks be added to Lloyd Ave. referencing a fund established by the township for sidewalk construction. Commissioner Contento explained that the township is exploring the potential for the sidewalk on Lloyd Ave. to be financed by a developer as part of a related project. Mr. Lentz also requested for the record that sidewalks be added from G.O. Carlson Blvd. to Lloyd Ave. Vice President Chambers requested that a discussion about the status of the sidewalk fund be held when all five Board Members are present. In conclusion Ms. Denne and Township Engineer Schuehler discussed the status of the Wedgewood sidewalk project with the design plan currently under review by PennDOT.

Township Solicitor – Kristin Camp

Wawa Bondsville LD 2016 License Agreement

Solicitor Camp presented the licensing agreement for Wawa Bondsville Rd LD 2016 to be reviewed and approved by the Board of Commissioners. This agreement between Caln Township and Provco Pinegood

Thorndale, LLC (the land owner) states that Provco intends to install a wall which will include lettering reading "Thorndale" at the proposed Wawa Food Market located at the intersection of Lincoln Highway and Marshallton-Thorndale Road. Mrs. Camp described the terms of the license agreement stating Provco intends to construct and maintain the sign. Commissioner Breton entertained a motion to approve the license agreement. Moved by Commissioner Contento and seconded by Commissioner Chambers. Vote passed, 3-0.

Toll Bros Property Dedication-Parcel 39-4B-2

Solicitor Camp presented the dedication of a 0.351-acre parcel by Toll Bros (Robert and Bruce Toll) for review and approval, this property lies adjacent to other township land located on the north side of Bailey Road, south of the Route 30 Bypass (adjacent to Ingleside Golf Course). Mrs. Camp stated that a Phase I Environmental Site Assessment had been performed by Advantage Engineers, LLC and that no adverse environmental conditions were found on the property. Commissioner Breton entertained a motion to approve the dedication. Moved by Commissioner Contento and seconded by Commissioner Chambers. Vote passed, 3-0.

Township Manager-Kristen Denne

Manager Denne introduced and welcomed Carol Schuehler from Cedarville Engineering Group. Carol will serve as the new representative for Caln Township. Ms. Denne stated Ms. Schuehler has 30 years of experience and is an infrastructure expert.

Manager Denne informed the Board that she met with members from TMACC who will be publishing a white paper on the Thorndale shopping area. The study will include information on sidewalks that connect to public transit, specifically the Thorndale Train Station. Special Intersection issues that were presented at a previous meeting were provided for review by TMACC.

Manager Denne requested the Board contact her regarding the SEPTA FY 2019 Annual Service Plan with any feedback or suggestions for the infrastructure on the SEPTA line. Commissioner Contento suggested Sunday service be extended to Thorndale.

Public Comments

Commissioner Breton called for public comments.

Resident Thomas Walker expressed concern about traffic congestion with the construction of the two proposed Wawa Food Markets in Caln Township. Commissioner Breton stated that a traffic improvement study is being conducted for the proposed stores. Commissioner Contento also noted a PennDOT study is being conducted on traffic areas from Parkesburg to Route 82 and on to Route 322. These studies seek to improve challenging intersections in the township. Commissioner Contento noted current plans to alleviate the challenging intersection at the proposed Reeceville Rd. Wawa. Mr. Contento also noted improvements made to traffic signals in the past few years.

Township Engineer-Carol Schuehler

MS4 Presentation

April Barkasi, CEO of Cedarville Engineering introduced Beth Uhler, the Stormwater Program Manager from Cedarville Engineering. Beth led a discussion about the NPDES MS4 Program. The program is a federally mandated permit program enforced by the EPA which requires compliance in managing stormwater as a point-source pollutant. The presentation at the 8/10/17 meeting satisfies the permit requirement of informing the public and receiving feedback and questions in a public forum. It was noted that the entire presentation was also available for review online at the Caln Township website. The plan was also posted in the Township building on July 26th and will remain there for 30 days to allow for written comments. The Pollutant Reduction Plan proposed will reduce sediment and nutrients load by 10% and phosphorus load by 5% to West Branch

Brandywine Creek over the 5-year permit term. There is a proposed project to take place at Caln Park West for the installation of a rain garden. The rain garden would be paid for and maintained by Caln Township and brings the township into compliance with this portion (Stormwater management) of the requirements. The rain garden would be located at the west end of the Caln Park West Soccer Fields. The plan, which is estimated to cost approximately \$70,000 for design and construction, projects to reduce sediment by 24% and phosphorous by 18%. This meets and exceeds the reduction requirements. It was asked if the surplus over the requirements could be applied to any future requirements and Beth explained that is unknown at this time. The public comment period will close on 8/25/17. After comments are received and addressed, the permit application will be submitted by 9/16/17. Beth explained that the document is fluid and may be revised at any time.

Resident Tony DiSario asked several questions about maintenance, pollution and the functionality of the rain garden.

Commissioner Contento explained and summarized the rain garden and how it functions. Commissioner Chambers asked if there would be any problems with mosquitos. Beth explained that if the rain garden is functioning properly no mosquitos should be present. No further questions were presented.

Ordinances and Resolutions for Consideration –
Resolution Approving Fulton Bank Loan (Roof Project)

Commissioner Breton entertained a motion to approve the Fulton Bank Loan Resolution in the amount of \$120,000. Moved by Commissioner Contento and seconded by Commissioner Chambers. Vote passed, 3-0.

Resolution Appointing Parks & Recreation Board Member

Commissioner Breton entertained a motion to approve the appointment of Jo Detelus to the Parks & Recreation Board to fulfill a vacancy with a term to expire December 31, 2017. Moved by Commissioner Chambers and seconded by Commissioner Contento. Vote passed, 3-0.

Bill List – Checks 40301-40368

Commissioner Breton entertained a motion to approve general checks 40301-40368. Moved by Commissioner Chambers and seconded by Commissioner Contento. Vote passed, 3-0.

Approval of Minutes from July 13, 2017 & July 27, 2017

Commissioner Breton entertained a motion to approve the meeting minutes from July 13, 2017 and July 27, 2017. Moved by Commissioner Chambers and seconded by Commissioner Contento. Vote passed, 3-0.

Board and Commission Updates

Historical Commission-Lorraine Tindaro provided an update summary

- Working on getting a bench in memory of Tom DeFroscia who passed away.
- Planning a summer picnic in September 2017
- The Schoolhouse has been opened on the first Sundays of each month and a lot of residents are touring it.

Additional Business

Commissioner Contento asked about the dog park intersection status in regard to line painting and free pedestrian crossing signs. Township Manager Denne said she would put in a work order for line painting but that the pedestrian crossing signs were no longer being offered for free by the state.

Commissioner Breton noted the Twinning Project with Calne, England and said that they will be hosting their English counterparts from October 7, 2018 to October 14, 2018. A meeting will be held to discuss the program on August 17 at 6:00 PM. If interested in attending contact Commissioner Breton.

Commissioner Contento requested an update on the formation of a committee and who will be on it for the Sesquicentennial Celebration. Ms. Denne stated she is still looking for direction from the Board on this matter. Commissioner Contento expressed that he felt representatives from the Historical Commission, the Historical Society, Parks and Recreation, Lincoln Highway, and the Chambers of Commerce should be included on the committee. Commissioner Breton advised that this be an agenda item for the next meeting where all 5 members would be present.

Adjournment

Commissioner Breton entertained a motion to adjourn the August 10, 2017 meeting at 9:30 PM. Moved by Commissioner Contento and seconded by Commissioner Chambers. Vote passed 3-0.

Respectfully Submitted by,

Jennifer Schwed,
Recording Secretary

**Work Session Agenda
Caln Township Board of Commissioners
August 9, 2018
7:30 PM Work Session**

(6:30 PM Taco Bell Conditional Use Hearing)

Call to Order and Salute to the Flag

Citizens to be Heard

Township Solicitor – Ms. Camp

- I. TV-1 Zoning Ordinance Amendment
- II. Dedication agreement of the storm sewer system in the Village at Thorndale Green
- III. Ordinance 2018-05 Amending Chapter 83 “Fire Prevention”re-numbered 2018-07

Township Manager—Ms. Denne

Township Engineer—Mr. Flinchbaugh

- I. Fisherville Road Bridge bid results
- II. MS4 Presentation

Ordinances and Resolutions for Consideration

- I. Resolution 2018-34 Disposal of Miscellaneous Township Documents
- II. Resolution 2018-35 Budget Amendment

Bill List

- I. General Checks – motion to approve
 - General Manual Check 17, and General Checks 42062 to 42114

Minutes for Approval

- I. July 26, 2018

Boards and Commissions Updates—summary by applicable Board Liaison

- I. Park and Recreation
- II. COG
- III. Municipal Authority
- IV. DARA
- V. Fire Board
- VI. Planning Commission
- VII. Historical Commission
- VIII. Lincoln Highway/150th

Additional Business

Public Comments

Adjournment

The next meeting of the Caln Township Board of Commissioners will be on August 30, 2018 at 7:30 PM.

Appendix B

Developed Land Loading Rates for PA Counties

ATTACHMENT B

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

County	Category	Acres	TN lbs/acre/yr	TP lbs/acre/yr	TSS (Sediment) lbs/acre/yr
Adams	impervious developed	10,373.2	33.43	2.1	1,398.77
	pervious developed	44,028.6	22.99	0.8	207.67
Bedford	impervious developed	9,815.2	19.42	1.9	2,034.34
	pervious developed	19,425	17.97	0.68	301.22
Berks	impervious developed	1,292.4	36.81	2.26	1,925.79
	pervious developed	5,178.8	34.02	0.98	264.29
Blair	impervious developed	3,587.9	20.88	1.73	1,813.55
	pervious developed	9,177.5	18.9	0.62	267.34
Bradford	impervious developed	10,423	14.82	2.37	1,880.87
	pervious developed	23,709.7	13.05	0.85	272.25
Cambria	impervious developed	3,237.9	20.91	2.9	2,155.29
	pervious developed	8,455.4	19.86	1.12	325.3
Cameron	impervious developed	1,743.2	18.46	2.98	2,574.49
	pervious developed	1,334.5	19.41	1.21	379.36
Carbon	impervious developed	25.1	28.61	3.97	2,177.04
	pervious developed	54.2	30.37	2.04	323.36
Centre	impervious developed	7,828.2	19.21	2.32	1,771.63
	pervious developed	15,037.1	18.52	0.61	215.84
Chester	impervious developed	1,838.4	21.15	1.46	1,504.78
	pervious developed	10,439.8	14.09	0.36	185.12
Clearfield	impervious developed	9,638.5	17.54	2.78	1,902.9
	pervious developed	17,444.3	18.89	1.05	266.62
Clinton	impervious developed	7,238.5	18.02	2.80	1,856.91
	pervious developed	11,153.8	16.88	0.92	275.81
Columbia	impervious developed	7,343.1	21.21	3.08	1,929.18
	pervious developed	21,848.2	22.15	1.22	280.39
Cumberland	impervious developed	8,774.8	28.93	1.11	2,065.1
	pervious developed	26,908.6	23.29	0.34	306.95
Dauphin	impervious developed	3,482.4	28.59	1.07	1,999.14
	pervious developed	9,405.8	21.24	0.34	299.62
Elks	impervious developed	1,317.7	18.91	2.91	1,556.93
	pervious developed	1,250.1	19.32	1.19	239.85
Franklin	impervious developed	13,832.3	31.6	2.72	1,944.85
	pervious developed	49,908.6	24.37	0.76	308.31
Fulton	impervious developed	3,712.9	22.28	2.41	1,586.75
	pervious developed	4,462.3	18.75	0.91	236.54
Huntington	impervious developed	7,321.9	18.58	1.63	1,647.53
	pervious developed	11,375.4	17.8	0.61	260.15
Indiana	impervious developed	589	19.29	2.79	1,621.25
	pervious developed	972	20.1	1.16	220.68
Jefferson	impervious developed	21.4	18.07	2.76	1,369.63
	pervious developed	20.4	19.96	1.24	198.60
Juniata	impervious developed	3,770.2	22.58	1.69	1,903.96
	pervious developed	8,928.3	17.84	0.55	260.68
Lackawana	impervious developed	2,969.7	19.89	2.84	1,305.05
	pervious developed	7,783.9	17.51	0.76	132.98
Lancaster	impervious developed	4,918.7	38.53	1.55	1,480.43
	pervious developed	21,649.7	22.24	0.36	190.93
Lebanon	impervious developed	1,192.1	40.58	1.85	1,948.53
	pervious developed	5,150	27.11	0.4	269.81
Luzerne	impervious developed	5,857	20.43	3	1,648.22
	pervious developed	13,482.9	19.46	0.98	221.19
Lycoming	impervious developed	10,031.7	16.48	2.57	1,989.64
	pervious developed	19,995.5	16	0.84	277.38

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

Notes:

- 1 These land loading rate values may be used to derive existing pollutant loading estimates under DEP's simplified method for PRP development. MS4s may choose to develop estimates using other scientifically sound methods.
- 2 Acres and land loading rate values for named counties in the Chesapeake Bay watershed are derived from CAST. (The column for Acres represents acres within the Chesapeake Bay watershed). For MS4s located outside of the Chesapeake Bay watershed, the land loading rates for "All Other Counties" may be used to develop PRPs under Appendix E; these values are average values across the Chesapeake Bay watershed.
- 3 For land area outside of the urbanized area, undeveloped land loading rates may be used where appropriate. When using the simplified method, DEP recommends the following loading rates (for any county) for undeveloped land:
 - TN – 10 lbs/acre/yr
 - TP – 0.33 lbs/acre/yr
 - TSS (Sediment) – 234.6 lbs/acre/yr

These values were derived by using the existing loads for each pollutant, according to the 2014 Chesapeake Bay Progress Run, and dividing by the number of acres for the unregulated stormwater subsector.

Appendix C

Supporting Calculations

Conversion from NLCD 2011 Land Use Designation to Impervious and Pervious Areas

MUNICIPALITY: Caln Township
MS4 SEWER SHED: West Branch Brandywine Creek
COUNTY: Chester

Developed Land:

Land Use ¹	Area (ac)	% Impervious ²	Impervious Area (ac)	Pervious Area (ac)
Developed, Open Space	112.85	19	21.44	91.41
Developed, Low Intensity	70.61	49	34.60	36.01
Developed, Medium Intensity	17.72	79	14.00	3.72
Developed, High Intensity	4.70	100	4.70	
Pasture/Hay	30.05	0		30.05
Cultivated Crops	8.19	0		8.19
Shrub/Scrub	35.29	0		35.29
Grasslands/Herbaceous	0.04	0		0.04
Evergreen Forest	0.71	0		0.71
Deciduous Forest	148.54	0		148.54
Total	428.70		74.74	353.96

1. NLCD 2011 Land Use and Areas

2. Highest % of impervious used from each NLCD 2011 definition per PADEP



Existing Loads using Chesapeake Bay Loading Rates without BMPs

MUNICIPALITY: Caln Township
 MS4 SEWER SHED: West Branch of Brandywine Creek
 COUNTY: Chester

Developed Land:

Land Use	Area (ac)	Pollutant			Pollutant Load		
		TN (lbs/ac/yr)	TP (lbs/ac/yr)	TSS [Sediment] (lbs/ac/yr)	TN (lbs/yr)	TP (lbs/yr)	TSS [Sediment] (lbs/yr)
Impervious, Developed	74.74	21.15	1.46	1,504.78	1580.75	109.12	112467.26
Pervious, Developed	353.96	14.09	0.36	185.12	4987.30	127.43	65525.08
West Branch of Brandywine Creek Total Pollutant Load					6,568.05	236.55	177,992.33



Pollutant Removal Reductions using PADEP BMP Effectiveness Value Table for Existing BMPs

BMP NAME: Kingswood Basin
MUNICIPALITY: Caln Township
MS4 SEWERSHED: West Branch Brandywine Creek
COUNTY: Chester
RETROFIT CLASS: Existing BMP
LOCATION: 91 Kingswood Lane
GPS LOCATION: Lat: 40.0057 / Long: -75.8001
TOTAL DRAINAGE AREA TREATED (ac): 2.38
TYPE OF BMP: Extended Detention

Developed Land Imp/Pervious Calculations:

Land Use ¹	Area (ac)	% Impervious ²	Impervious Area (ac)	Pervious Area (ac)
Developed, Open Space	0.74	19	0.14	0.60
Developed, Low Intensity	0.37	49	0.18	0.19
Deciduous Forest	0.18	0		0.18
Shrub/Scrub	1.09	0		1.09
Total	2.38		0.32	2.06

Developed Land - Pollutant Reduction:

Land Use	Area (ac)	Pollutant Loading Rates ³			BMP Effectiveness Value ⁴			Pollutant Load Reduction		
								TN (lbs/yr)	TP (lbs/yr)	TSS [Sediment] (lbs/yr)
Impervious, Developed	0.32	21.15	1.46	1,504.78	20%	20%	60%	1.36	0.09	290.63
Pervious, Developed	2.06	14.09	0.36	185.12	20%	20%	60%	5.80	0.15	228.60
Total Pollutant Reduction								7.16	0.24	519.23

1. NLCD 2011 Land Use and Areas
2. Highest % of impervious used from each NLCD 2011 definition per PADEP
3. From PADEP PRP Instructions Attachment B - Developed Land Loading Rates for PA Counties
4. Per PADEP NPDES BMP Effectiveness Values Table



Pollutant Removal Reductions using PADEP BMP Effectiveness Value Table for Existing BMPs

BMP NAME: Millwood Basin
MUNICIPALITY: Caln Township
MS4 SEWERSHED: West Branch Brandywine Creek
COUNTY: Chester
RETROFIT CLASS: Existing BMP
LOCATION: 300 Millwood Lane
GPS LOCATION: Lat: 40.0503 / Long: -75.8060
TOTAL DRAINAGE AREA TREATED (ac): 10.42
TYPE OF BMP: Extended Detention

Developed Land Imp/Pervious Calculations:

Land Use ¹	Area (ac)	% Impervious ²	Impervious Area (ac)	Pervious Area (ac)
Developed, Open Space	3.59	19	0.68	2.91
Developed, Low Intensity	2.42	49	1.19	1.23
Deciduous Forest	0.70	0		0.70
Shrub/Scrub	0.40	0		0.40
Cultivated Crops	3.32	0		3.32
Total	10.43		1.87	8.56

Developed Land - Pollutant Reduction:

Land Use	Area (ac)	Pollutant Loading Rates ³			BMP Effectiveness Value ⁴			Pollutant Load Reduction		
								TN (lbs/yr)	TP (lbs/yr)	TSS [Sediment] (lbs/yr)
Impervious, Developed	1.87	21.15	1.46	1,504.78	20%	20%	60%	7.90	0.55	1686.47
Pervious, Developed	8.56	14.09	0.36	185.12	20%	20%	60%	24.13	0.62	951.01
Total Pollutant Reduction								32.03	1.16	2,637.48

1. NLCD 2011 Land Use and Areas
2. Highest % of impervious used from each NLCD 2011 definition per PADEP
3. From PADEP PRP Instructions Attachment B - Developed Land Loading Rates for PA Counties
4. Per PADEP NPDES BMP Effectiveness Values Table



Pollutant Removal Reductions using PADEP BMP Effectiveness Value Table for Existing BMPs

BMP NAME: CMR Residential Subdivision Bio-Swale
MUNICIPALITY: Caln Township
MS4 SEWERSHED: West Branch Brandywine Creek
COUNTY: Chester
RETROFIT CLASS: Existing BMP
LOCATION: 103 Collins Way
GPS LOCATION: Lat: 40.0039 / Long: -75.7916
TOTAL DRAINAGE AREA TREATED (ac): 2.9
TYPE OF BMP: Bio-Swale

Developed Land Imp/Pervious Calculations:

Land Use ¹	Area (ac)	% Impervious ²	Impervious Area (ac)	Pervious Area (ac)
Developed, Open Space	1.23	19	0.23	1.00
Developed, Low Intensity	0.58	49	0.28	0.30
Developed, Medium Intensity		79		
Deciduous Forest		0		
Hay/Pasture		0		
Shrub/Scrub	1.09	0		1.09
Total	2.90		0.52	2.38

Developed Land - Pollutant Reduction:

Land Use	Area (ac)	Pollutant Loading Rates ³			BMP Effectiveness Value ⁴			Pollutant Load Reduction		
								TN (lbs/yr)	TP (lbs/yr)	TSS [Sediment] (lbs/yr)
Impervious, Developed	0.52	21.15	1.46	1,504.78	70%	75%	80%	7.67	0.57	623.46
Pervious, Developed	2.38	14.09	0.36	185.12	70%	75%	80%	23.49	0.64	352.78
Total Pollutant Reduction								31.16	1.21	976.24

1. NLCD 2011 Land Use and Areas
2. Highest % of impervious used from each NLCD 2011 definition per PADEP
3. From PADEP PRP Instructions Attachment B - Developed Land Loading Rates for PA Counties
4. Per PADEP NPDES BMP Effectiveness Values Table



Pollutant Removal Reductions using PADEP BMP Effectiveness Value Table for Existing BMPs

BMP NAME: VA Medical Center - Hospice Additon Infiltration Trench
MUNICIPALITY: CaIn Township
MS4 SEWERSHED: West Branch Brandywine Creek
COUNTY: Chester
RETROFIT CLASS: Existing BMP
LOCATION: 1625 Blackhorse Road
GPS LOCATION: Lat: 40.0000 / Long: -75.7940
TOTAL DRAINAGE AREA TREATED (ac): 5.42
TYPE OF BMP: Infiltration trench

Developed Land Imp/Pervious Calculations:

Land Use ¹	Area (ac)	% Impervious ²	Impervious Area (ac)	Pervious Area (ac)
Developed, Open Space	2.46	19	0.47	1.99
Developed, Low Intensity	2.59	49	1.27	1.32
Developed, Medium Intensity	0.22	79	0.17	0.05
Deciduous Forest		0		
Hay/Pasture	0.15	0		0.15
Shrub/Scrub		0		
Total	5.42		1.91	3.51

Developed Land - Pollutant Reduction:

Land Use	Area (ac)	Pollutant Loading Rates ³			BMP Effectiveness Value ⁴			Pollutant Load Reduction		
								TN (lbs/yr)	TP (lbs/yr)	TSS [Sediment] (lbs/yr)
Impervious, Developed	1.91	21.15	1.46	1,504.78	85%	85%	95%	34.34	2.37	2730.85
Pervious, Developed	3.51	14.09	0.36	185.12	85%	85%	95%	42.03	1.07	617.23
Total Pollutant Reduction								76.38	3.44	3,348.08

1. NLCD 2011 Land Use and Areas
2. Highest % of impervious used from each NLCD 2011 definition per PADEP
3. From PADEP PRP Instructions Attachment B - Developed Land Loading Rates for PA Counties
4. Per PADEP NPDES BMP Effectiveness Values Table



Pollutant Removal Reductions using PADEP BMP Effectiveness Value Table for New BMPs

BMP NAME: E. Kings Highway Stream Restoration
MUNICIPALITY: Caln Township
MS4 SEWERSHED: West Branch Brandywine Creek
COUNTY: Chester
RETROFIT CLASS: New Retrofit Facility
LOCATION: E. Kings Highway and Moore Road
GPS LOCATION: Lat: 40.0039 / Long: -75.8106
TOTAL DRAINAGE AREA TREATED (ac): 59.15
TYPE OF BMP: Stream Restoration

Stream Restoration - Pollutant Reduction:

Location	Restoration Length (ft)	BMP Effectiveness Value ¹			Pollutant Load Reduction		
		TN (lbs/ft/yr)	TP (lbs/ft/yr)	Sediment (lbs/ft/yr)	TN (lbs/yr)	TP (lbs/yr)	TSS [Sediment] (lbs/yr)
West Branch Brandywine Creek	400	0.075	0.068	44.88	30.00	27.20	17952.00
Total					30.00	27.20	17,952.00

1. Per PADEP NPDES BMP Effectiveness Values Table



Appendix D

Proposed BMP Map

NOTES:

1. Property Owner:

-Jane & Alray Johnson
1208 Kings Hwy
-Daniel & Kelly Hughes
303 Moore Rd

2. The Stream Restoration has

a minimum project length of 400 LF.

PROPOSED BMP



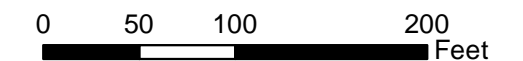
Legend

- MS4 Outfalls
- Stream Restoration
- Planning Area
- Stormwater Structures Township Inlet
- Stormwater Structures Township Manhole
- Stormwater Structures Township Inflow
- Stormwater Structures Township Outflow
- Stormwater Structures State Inlet
- Stormwater Structures State Manhole
- Stormwater Structures State Inflow
- Stormwater Structures State Outflow
- Stormwater Structures Private Inlet
- Stormwater Structures Private Manhole
- Stormwater Structures Private Inflow
- Stormwater Structures Private Outflow
- Stormwater Structures Private Riser
- Stormwater Conveyance Culvert
- Stormwater Conveyance Pipe
- Stormwater Conveyance Swale
- PCSM BMPs
- Existing BMPs
- Located Tributaries
- Streams
- Roads Township
- Roads PennDOT
- Roads Private
- 2ft Contours
- Parcels
- Township Boundary

**MINIMUM STREAM RESTORATION
PROJECT LENGTH 400 LF**

Unname Tributary to West Branch Brandywine Creek Stream Restoration

1 inch = 100 feet



DISCLAIMER:

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

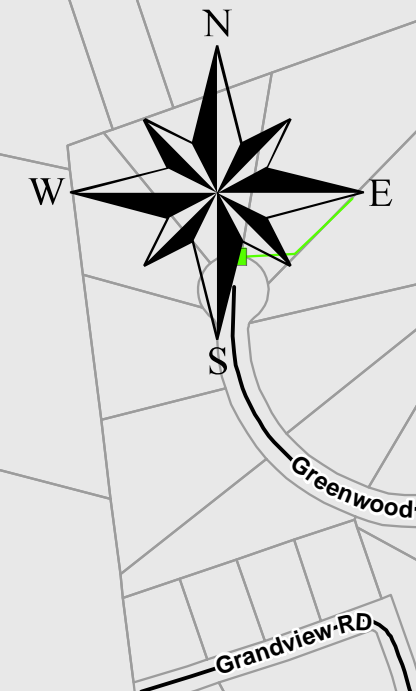
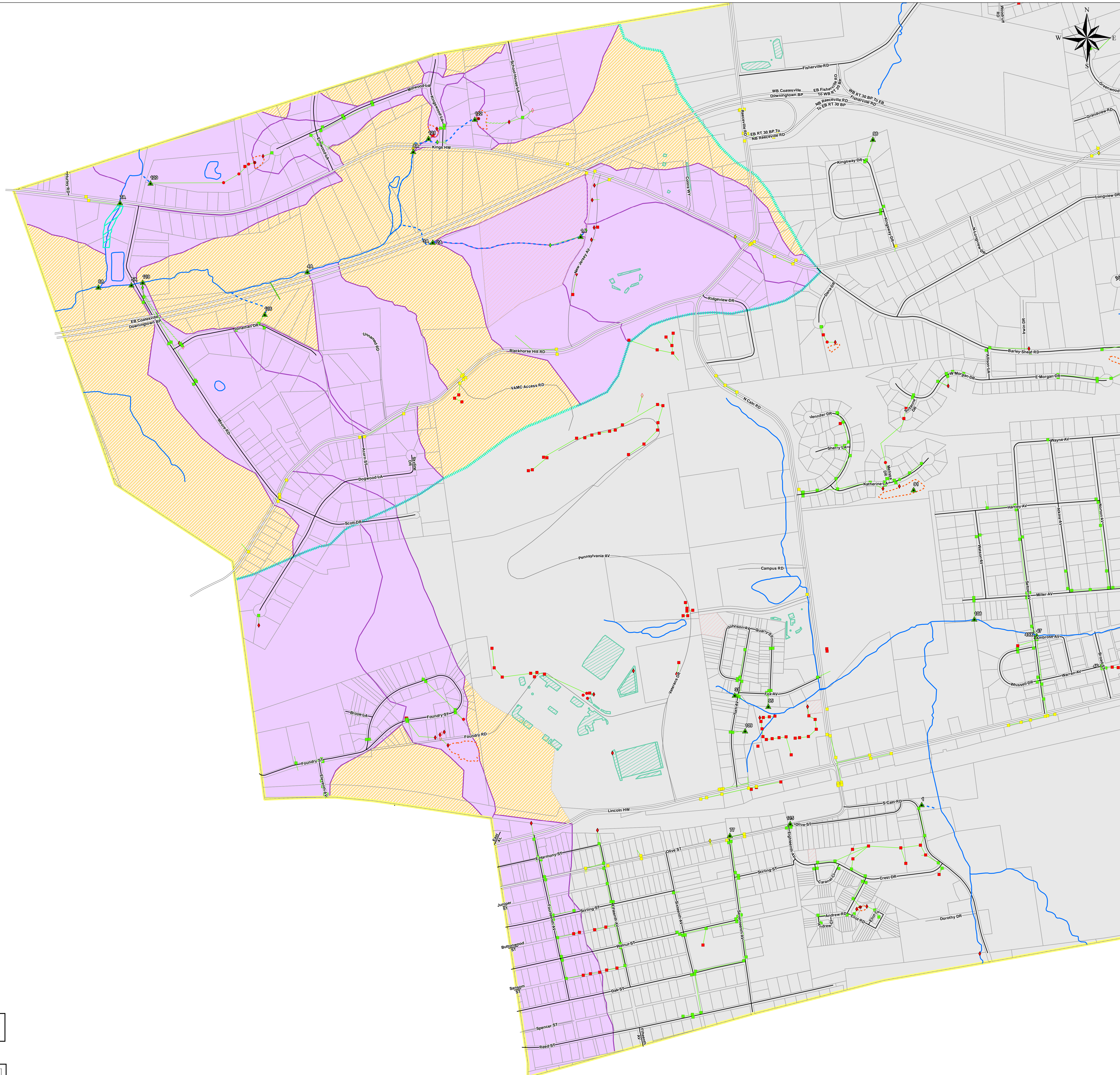
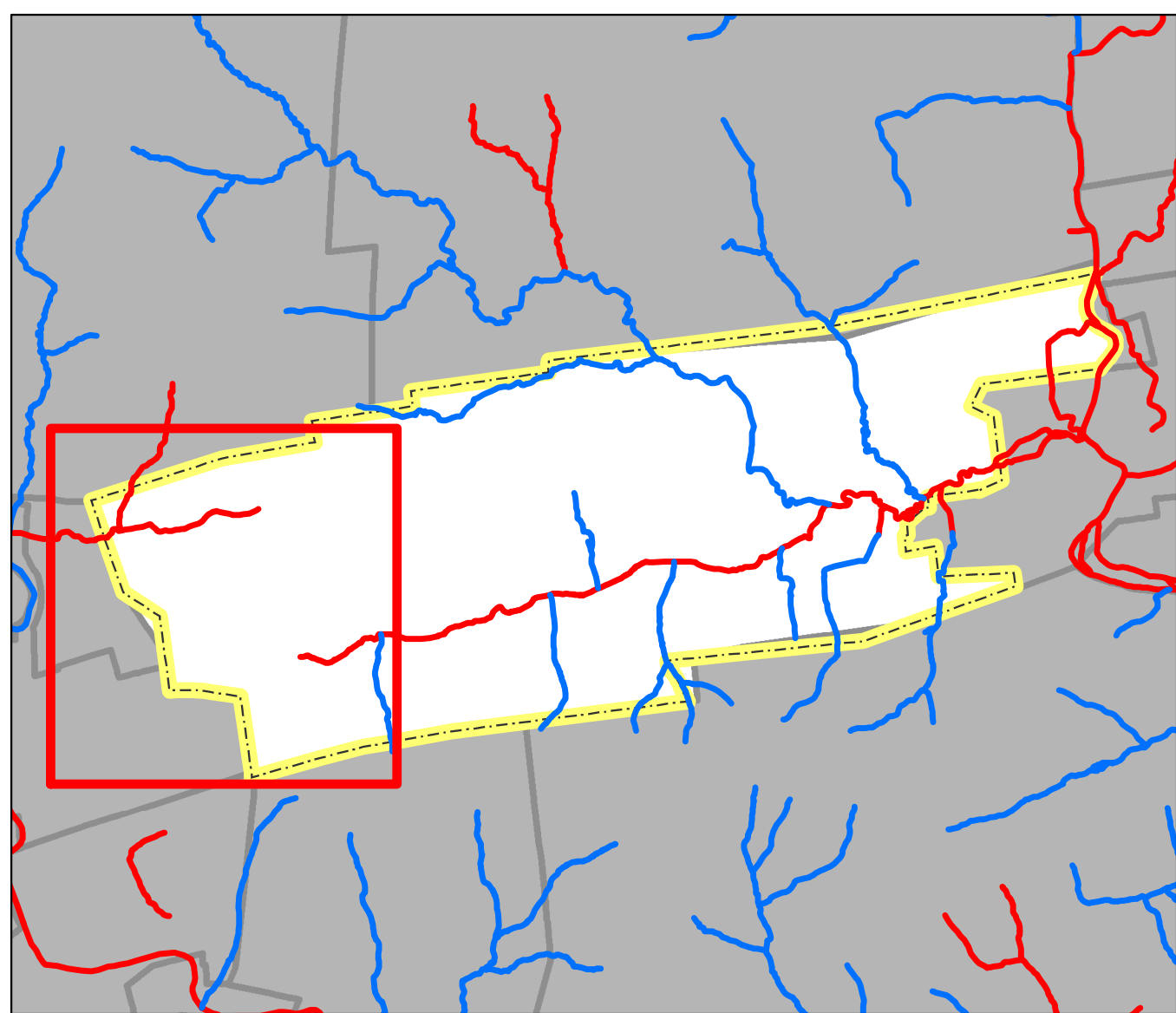


Cain Township,
Chester County,
Pennsylvania

MAP UPDATED: AUGUST 2018

Appendix E

Storm Sewershed/Planning Area Map



NOTES:
 1. The entire Township is within the 2010 Urbanized Area.
 2. Unnamed Tributary to West Branch Brandywine Creek Stream Restoration has a minimum project length of 400 linear feet.

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DRAWN BY: AR
 DATE: 8/16/2018
 1 inch = 300 feet
 0 300 600 Feet



CALN TOWNSHIP
POLLUTANT REDUCTION PLAN
PLANNING AREA MAP
 CHESTER COUNTY, PA

- Legend**
- Stream Restoration
 - Proposed BMP
 - MS4 Outfalls
 - Planning Area
 - Parsed Areas
 - Land Areas in Which Stormwater Runoff Does Not Enter the MS4
 - Non-Impaired
 - Stormwater Structures Township
 - Inlet
 - Manhole
 - Inflow
 - Outflow
 - Stormwater Structures State
 - Inlet
 - Manhole
 - Inflow
 - Outflow
 - Stormwater Structures Private
 - Inlet
 - Manhole
 - Inflow
 - Outflow
 - Riser
 - Stormwater Conveyance
 - Culvert
 - Pipe
 - Swale
 - Roads
 - Township
 - PennDOT
 - Private
 - Streams
 - Located Tributaries
 - PCSM BMPs
 - Existing BMPs
 - Township Owned Parcels
 - Parcels
 - Subwatershed
 - Township Boundary

BEST MANAGEMENT PRACTICE (BMP)

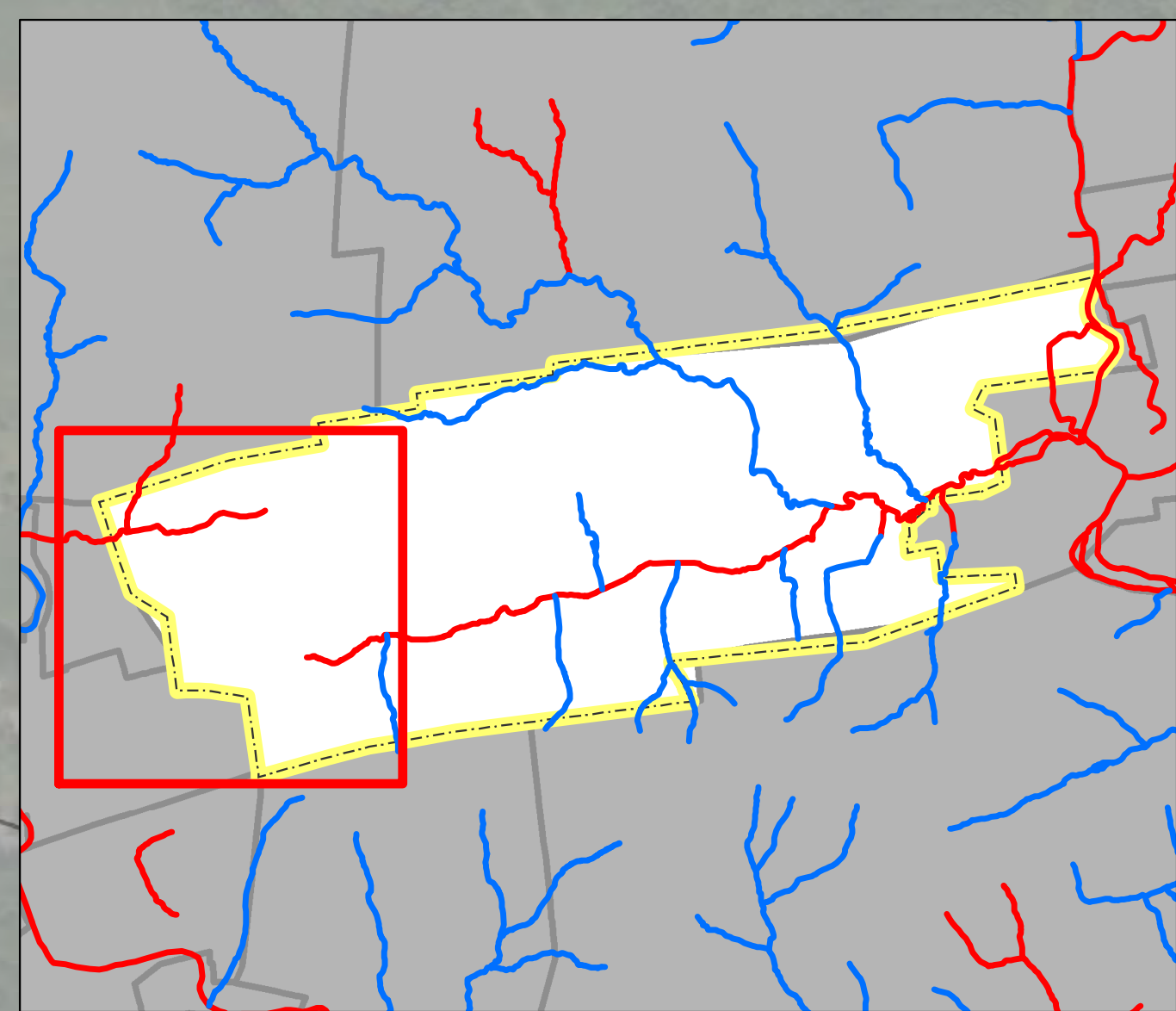
Name	Owner	Ownership
Unnamed Tributary to West Branch Brandywine Creek Stream Restoration	Jane & Alray Johnson Daniel & Kelly Hughes	Private

DEP MS4 Aggregated Requirements Table

MS4 ID	MS4 Name	MS4 Type	MS4 Category	MS4 Status	MS4 Location	MS4 Description
001	Caln Township	MS4	MS4	MS4	Caln Township	MS4

Appendix F

Land Cover Map



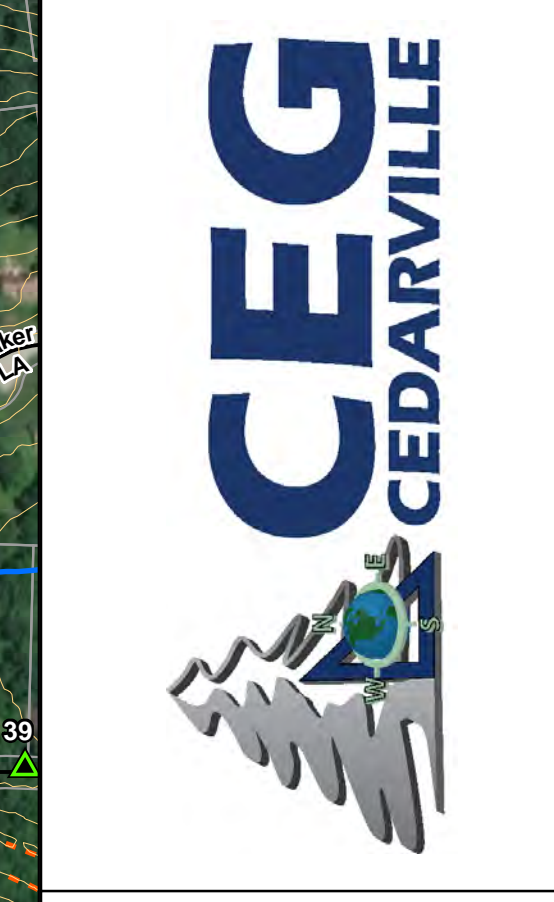
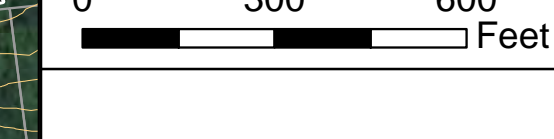
NOTES:
 1. The entire Township is within the 2010 Urbanized Area.
 2. Unnamed Tributary to West Branch Brandywine Creek Stream Restoration has a minimum project length of 400 linear feet.
 3. Land cover data is derived from the National Land Cover Database 2011 (NLCD 2011).

DISCLAIMER:
 This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

DRAWN BY: AR

DATE: 8/16/2018

1 inch = 300 feet



CALN TOWNSHIP
 POLLUTANT REDUCTION PLAN
 LAND COVER MAP
 CHESTER COUNTY, PA

- Legend**
- Stream Restoration Proposed BMP
 - MS4 Outfalls
 - Planning Area
 - Parsed Areas**
 - Land Areas in Which Stormwater Runoff Does Not Enter the MS4
 - Land Cover**
 - 21- Developed, Open Space
 - 22- Developed, Low Intensity
 - 23- Developed, Medium Intensity
 - 24- Developed, High Intensity
 - 41- Deciduous Forest
 - 42- Evergreen Forest
 - 52- Shrub/Scrub
 - 71- Grassland/Herbaceous
 - 81- Hay/Pasture
 - 82- Cultivated Crops
 - Roads**
 - Township
 - PennDOT
 - Private
 - Streams
 - Located Tributaries
 - PCSM BMPs
 - Existing BMPs
 - Index Contours
 - Township Owned Parcels
 - Parcels
 - Subwatershed
 - Township Boundary

BEST MANAGEMENT PRACTICE (BMP)

Name	Owner	Ownership
Unnamed Tributary to West Branch Brandywine Creek Stream Restoration	Jane & Alray Johnson Daniel & Kelly Hughes	Private

DEP MS4 Aggregated Requirements Table

MS4	MS4 ID	MS4 Name	MS4 Type	MS4 Status	MS4 Location
1	1000000000	West Branch Brandywine Creek	MS4	Active	West Branch Brandywine Creek

