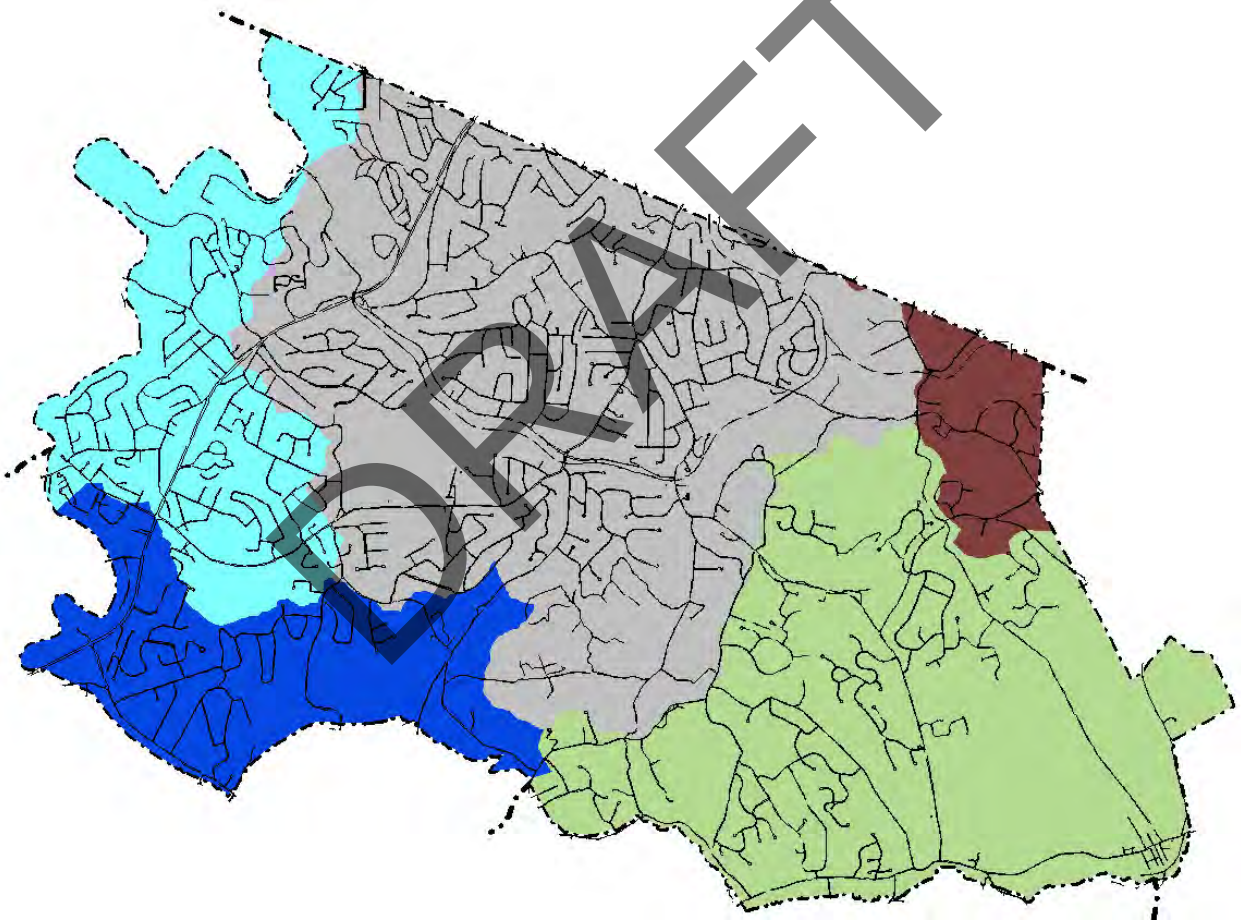
PRP / TMDL Plan
Peters Township, Washington County

PAI136134



September 2017

August 2012
Revised – October 2015
Re-issued – September 2017

PRP / TMDL Plan
Peters Township
Brush Run watershed

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August 2012
Revised – October 2015
Re-issued – September 2017

TMDL Title:

Title: "Total Maximum Daily Load, Nutrient and Sediment for the Unnamed Tributary to Brush Run and Upper Portions of Brush Run , Allegheny and Washington Counties, Pennsylvania"

Prepared by: United States Environmental Protection Agency, Region III

Dated: December 9, 2003

Watershed Name and HUC:

The TMDL applies to the upper portions of the Brush Run watershed, from the headwaters down to a point just above the discharge outfall of the Peters Township Sanitary Authorities' waste water treatment plant. The Hydrologic Unit Code is 05030101.

Pollutants and MS4 WLAs:

The TMDLs established for the Brush Run watershed are for sediment and phosphorus. The following table shows Waste Load Allocations for Peters Township each pollutant taken from the TMDL report:

Component/Source	WLA for Sediment (lbs/yr)	WLA for Total Phosphorus (lbs/yr)
Peters Township	175,384	200.2

Municipalities subject to TMDL:

Portions of Peters Township, Upper St. Clair, and Bethel Park comprise the upper Brush Run watershed and are subject to the TMDL.

Municipalities subject to TMDL:

Portions of both Washington County and Allegheny County comprise the upper Brush Run watershed and are subject to the TMDL.

Allocated pollutant loadings:

The following table shows overall TMDLs for the pollutants in question, Load Allocations, Margins of Safety, and Waste Load Allocations for the entire upper Brush Run watershed and is taken from the TMDLs report prepared by the EPA:

Component	Sediment (Lbs/yr)	Total Phosphorus (lbs/yr)
TMLD (Total Max. Daily Load)	224,348	786.7
MOS (Margin of Safety)	22,435	78.7
WLA (Waste Load Allocation)	201,913	252.8
LA (Load Allocation)	0	455.3

The following table shows the WLAs for Peters Township, Upper St. Clair, and Bethel Park for each pollutant:

Component/Source	WLA for Sediment (lbs/yr)	WLA for Total Phosphorus (lbs/yr)
Peters Township	***175,384***	***200.2***
Upper St. Clair	23,419	47.1
Bethel Park	3,107	5.6
TOTAL	201,913 +/-	252.8 +/-

Pollutant load reductions:

The TMDL report (Page 24) presents the following pollutant load reductions necessary to achieve the targeted TMDL on a **watershed-wide** basis:

Pollutant	Current Loading (lbs/yr)	Allowable Loading * (Lbs/yr)	% Reduction
Sediment	592,340	189,890	**68 %**
Phosphorus	207.19	81.01	**61 %**

* Note that the Allowable Loading = Waste Load Allocation (WLA) + Load Allocation (LA) – Loads Not Reduced (LNR)

THEREFORE, the pollutant load reductions required for **Peters Township** are:

Pollutant	WLA (lbs/yr)	Required % Reduction	Lbs/yr of pollutant that must be removed
Sediment	175,384	68%	**372,691**
Phosphorus	200.2	61%	**313.1**

Proposed BMPs and implementation schedule:

Peters Township's strategy to achieve the TMDLs for both sediment and phosphorus involves implementation of several Best Management Practices (BMPs) focused mainly around the concept of floodplain and stream restoration. The practice of floodplain restoration and stream restoration were specifically chosen for their ability to remove the large amounts of sediment and phosphorus necessary to achieve the TMDL for Brush Run. These types of projects are, however, significant undertakings in terms of design and construction and an implementation schedule spanning five (5) permit terms is proposed. ***A spreadsheet detailing the estimated amounts of sediment and phosphorus removed by each proposed BMP and a map showing the location of and watershed area to each BMP are contained in the Appendix of this document.*** The concept of each proposed BMP is summarized below:

Permit Term #1 BMP 1-1: Floodplain & Stream Restoration – Briarcliff Open Space

Peters Township owns large parcels of Open Space that were dedicated as part of the Briarcliff subdivision. A tributary to Brush Run and its associated floodplain flow through this property making an ideal candidate for a floodplain and stream restoration project. The overwhelming majority of the Township's active farmland is located within the 914 acre watershed draining to this proposed BMP. Therefore, it follows that a significant portion of the overall sediment and phosphorus loading in Brush Run can be attributed to the watershed draining to this proposed BMP. Because of the high pollutant removal efficiencies associated with this type of BMP (85% for both sediment and phosphorus), it will have a large impact towards achieving the TMDL and is thus proposed to be designed and implemented during the first permit cycle.

Permit Term #2 BMP 2-1: Constructed Wetlands – Township land near Mallard Lane

Peters Township owns a large parcel of land adjacent to and south of the Arrowhead Trail, near Mallard Lane. A tributary to Brush Run flows through this property and is conveyed underneath the Arrowhead Trail by a large concrete box culvert. The location, topography, and hydrology of the portion of this property immediately south of the Arrowhead Trail make it well suited to the construction of wetlands. Also, the 570 acre watershed draining to this proposed BMP contains the Rolling Hills Country Club Golf Course, which is estimated to be a significant contributor of sediment and phosphorus to Brush Run. If more area is needed to construct effective wetlands than what is owned by the Township, the upstream property owner may need to be contacted to reach an agreement on expanding the constructed wetlands southward.

Permit Term #3 BMP 3-1: Floodplain & Stream Restoration – PT Middle School

A tributary to Brush Run follows the property line between the Peters Township Middle School property on East McMurray Road and four residential properties with addresses on Stonebrook Drive. Once the tributary leaves the school district property, it flows through property owned by St. Benedict's Church prior to crossing under Valleybrook Road and entering the main stem

of Brush Run. The section of tributary involved with this proposed BMP shows the typical signs of erosion due to upstream development and is believed to be a suitable candidate for floodplain and stream restoration. Although not currently controlled by the Township, the institutional owners (church and school district) combined with a limited number of private owners (4) are thought to make this proposed BMP practical.

Permit Term #4 BMP 4-1: Floodplain & Stream Restoration – Sugar Camp Road

A twenty-seven (27) acre farm adjacent to Sugar Camp Road contains a large (2,500 linear feet), meandering portion of Brush Run. Not only does the agricultural activity of the adjacent cropland contribute significant to sediment and phosphorus loading in the stream, but, the channel itself continues to be eroded by increased runoff due to upstream development. For these reasons, it is thought that floodplain and stream restoration in at this location would be of great benefit toward achieving the pollutant TMDLs prescribed by the EPA. For this project to come to fruition, obviously, an agreement with the property owner would need to be negotiated regarding procurement of the land area needed for the project.

Permit Term #5 BMP 5-1: Stream Restoration – Valley Brook Road near Pelipetz Drive

The main stem of Brush Run that parallels Valley Brook Road clearly exhibits severe bank erosion due to upstream development and increased runoff volume. This was documented in the TMDL Report by the EPA. The Township owns two separate properties which contain the stream corridor in this area, with one privately-owned property in between the two owned by Peters. Obviously, an agreement with the one private property owner (which is currently a doctor's office) would need to be negotiated regarding procurement of the land area needed for the project.

Construction of the above-described BMPs is predicted to remove 415,490 pounds of sediment per year and 603.1 pounds of phosphorus per year, which meets or exceeds the required pollutant removal presented on page 2 of this Report. Again, these pollutant removal calculations are contained in spreadsheet form in the appendix of this Report. Specific design elements of the proposed BMPs for Permit Term #1 along with and Operation & Maintenance Plan will be developed and presented in the Design Details portion of the Township's TMDL Plan. Progress of the Township's TMDL Plan will be evaluated on an on-going basis throughout the implementation phase. The Plan will be adapted as necessary to ensure that the Township is making progress toward meeting the approved TMDLs and WLAs.

Other pollution-reducing strategies that have already been implemented or will be considered by Peters Township include the following:

Adoption of new SWM Ordinance/Act 167 Plan: A new Township SWM Ordinance consistent with the Washington County Act 167 was adopted in May 2011. This Ordinance contains numerous provisions that will have an effect on water quality over time. Although a large percentage of the Brush Run watershed is already developed, our new Ordinance will require

remaining building sites meeting the threshold criteria to employ SWM measures such as infiltration trenches, bioretention areas, dry wells, level spreaders, and other BMPs with high pollutant removal efficiencies for sediment and phosphorus. In addition to pollutant removal, these infiltration-focused BMPs will serve to reduce runoff volume, which is a significant contributor to in-stream bank erosion.

Street Sweeping program: Peters Township had traditionally contracted this service and only had the major roads swept a few times per year. In 2015, the Township purchased a Schwartze A7 Tornado regenerative air-type street sweeper. With this purchase, the Township Public Works Department will be able to sweep streets in-house and increase the frequency of sweeping as well as the overall road mileage swept. The pollutant reduction effects of this 'source control' type of BMP are difficult to quantify. However, published data shows that the regenerative air sweepers are effective at removing a large percentage of Total Suspended Solids and Phosphorus. Records on sweeping frequency, road mileage, and cubic yardage of material removed will be kept in conjunction with MCM #6 of the Township's MS4 Permit.

Focused educational outreach to farmers: A potential contributor to the siltation and nutrient impairments was identified as agricultural activity in the EPA TMDL report. The Township believes that the distribution of educational material to local farmers, such as the National Handbook of Conservation Practices or other Natural Resource Conservation Service literature, may help to instill better land management and agricultural practices.

APPENDIX

PETERS TOWNSHIP - BMPs PROPOSED TO ACHIVE WLA

						SEDIMENT				PHOSPHORUS				
Permit Term	BMP	Site ID	Location	Tributary Area to BMP (subwatershed) (ac.)	Land Use Types and Acreages in Subwatershed	Average Unit Area Loading Rate for Sediment (lbs/ac/yr) [1]	Sediment Load generated (lbs/yr)	BMP Sediment Removal Efficiency [2]	**Sediment Reduction (lbs/yr)**	Average Unit Area Loading Rate for Phosphorus (lbs/ac/yr) [1,2]	Phosphorus Load generated (lbs/yr)	BMP Phosphorus Removal Efficiency [2]	**Phosphorus Reduction (lbs/yr)**	Comments
1	Floodplain & Stream Restoration	**1-1**	Briarcliff Open Space (Bebout Road)	914	Cropland (30.1%), Pasture (27.4%), Mixed Forest (6.5%), Deciduous Forest (25.2%), Low Int. Dev. (10.9%)	75.99	69454.9	85%	**59,036.6**	0.08	73.1	85%	**62.2**	Project is on Township-Owned Open Space; watershed to BMP contains the majority of active farmland in Peters Township; Chapter 105 Permit required from PaDEP
	Linear Feet of Stream restored =		1500	45	lb/ft/yr [3]				**67,500.0**	0.068	lb/ft/yr		**102.0**	
2	Constructed Wetlands	**2-1**	Township Land (near Mallard Lane)	570	Pasture (33.3%), Mixed Forest (12.3%), Deciduous Forest (17.5%), Low Int. Dev. (36.8%)	7.08	4035.6	85%	**3,430.3**	0.03	17.1	85%	**14.5**	Project is mainly on Township-Owned land, however, some portion of the upstream parcel owned currently by Shipman may be required; Chapter 105 Permit required from PaDEP
3	Floodplain & Stream Restoration	**3-1**	PT Middle School (E. McMuray Rd)	440	Cropland (10.2%), Pasture (11.4%), Mixed Forest (11.4), Deciduous Forest (21.6%), Low Int. Dev. (45.5%)	26.89	11831.6	85%	**10,056.9**	0.04	17.6	85%	**15.0**	Project is on a combination of land owned by PT School District, St. Benedict's Church, and four (4) homeowners on Stonebrook Drive. Chapter 105 Permit required
	Linear Feet of Stream restored =		1400	45	lb/ft/yr [3]				**63,000.0**	0.068	lb/ft/yr		**95.2**	
4	Floodplain & Stream Restoration	**4-1**	Rothar Farm (Sugar Camp Road)	695	Cropland (18.8%), Pasture (14.4%), Mixed Forest (8.6%), Deciduous Forest (17.3%), Low Int. Dev. (40.9%)	47.34	32901.3	85%	**27,966.1**	0.06	41.7	85%	**35.4**	Project is on private property (Rothar) and an agreement will be needed; Chapter 105 Permit required
	Linear Feet of Stream restored =		2500	45	lb/ft/yr [3]				**112,500.0**	0.068	lb/ft/yr		**170.0**	
5	Stream restoration	**5-1**	Brush Run near Pelipetz Drive											Project is mainly on land owned by Peters; one additional commercial property owner is involved (Dr. Niesen); Chapter 105 Permit required
			1600	45	lb/ft/yr [3]				**72,000.0**	0.068	lb/ft/yr		**108.8**	
						TOTAL SEDIMENT REMOVED			**415,489.9**	TOTAL PHOSPHORUS REMOVED			**603.1**	

1 - See separate spreadsheet for calculation of Average Unit Area Loading Rates

2 - Pollutant removal efficiencies taken from PA BMP Manual

3 - Estimate of sediment removal rate for stream restoration taken from " Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects - FINAL REPORT" dated December 17, 2012

Required polutant load reductions: **372,691.0** **313.1**

Average Unit Area Loading Rates per proposed BMP project

			SEDIMENT					PHOSPHORUS					SEDIMENT	PHOSPHORUS
			Unit Area Loading Rates (lbs/ac/yr) from published TMDL Report					Unit Area Loading Rates (lbs/ac/yr) from published TMDL Report						
			18.77	232.66	1.24	2.87	0.45	0.05	0.2	0	0	0.04		
Site ID	BMP	Subwatershed Area to BMP (ac.)	Hay/Pasture (ac.)	Cropland (ac.)	Mixed Forest (ac.)	Deciduous Forest (ac.)	Low Intensity Development (ac.)	Hay/Pasture (ac.)	Cropland (ac.)	Mixed Forest (ac.)	Deciduous Forest (ac.)	Low Intensity Development (ac.)	AVG UNIT AREA LOADING RATE IN SUBWATERSHED DRAINING TO BMP (lbs/ac/yr)	AVG UNIT AREA LOADING RATE IN SUBWATERSHED DRAINING TO BMP (lbs/ac/yr)
1-1	Briarcliff Open Space Floodplain	914	250	275	59	230	100	250	275	59	230	100	75.99	0.08
			27.4%	30.1%	6.5%	25.2%	10.9%							
2-1	Township Land constructed wetlands	570	190	0	70	100	210	190	0	70	100	210	7.08	0.03
			33.3%	0.0%	12.3%	17.5%	36.8%							
3-1	PT Middle School floodplain	440	50	45	50	95	200	50	45	50	95	200	26.89	0.04
			11.4%	10.2%	11.4%	21.6%	45.5%							
4-1	Rothar Farm Floodplain Restoration	695	100	131	60	120	284	100	131	60	120	284	47.34	0.06
			14.4%	18.8%	8.6%	17.3%	40.9%							

Note: Unit Area Loading for each Land Use Type taken from published TMDL Report, EPA, 2003

PETERS TOWNSHIP
BMPs PROPOSED TO ACHIEVE WLA
Brush Run Watershed
OCTOBER 2015

Legend

- Storm Water Facilities
- hydro
- PT School Dist
- Township Open Space
- Township Land
- Public Parks
- Plots
- Brush Run Watershed

ID 3-1 PROPOSED BMP LOCATION

440 ac.

695 ac.

570 ac.

914 ac.

ID 5-1

ID 3-1

ID 4-1

ID 2-1

ID 1-1

DRAFT

Brush Run Watershed

SCALE
1" = 1900'

N