

WHITPAIN TOWNSHIP  
WISSAHICKON CREEK WATERSHED  
MS4 TMDL STRATEGY PLAN



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## 1. BACKGROUND & TMDL TITLE

In October 2003, the United States Environmental Protection Agency established a Total Maximum Daily Load, or "TMDL", for the Wissahickon Creek watershed located in both Montgomery County and Philadelphia County in the Commonwealth of Pennsylvania. The US EPA defines a TMDL as "a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that load among the various sources of that pollutant." Pollutant sources are characterized as either (1) point sources – only point sources can receive a TMDL as a Waste Load Allocation (WLA); and (2) nonpoint sources – nonpoint sources receive a TMDL as a Load Allocation (LA). Point sources include all sources subject to regulation under the NPDES program including stormwater discharges from regulated small MS4's. Whitpain Township is classified as a regulated small MS4 by the PA DEP. **The TMDL is entitled "Nutrient and Siltation TMDL Development for Wissahickon Creek, Pennsylvania"**. The TMDL was prepared by the United States Environmental Protection Agency, Region 3, 1650 Arch Street, Philadelphia, PA.

The US EPA established the TMDL for the Wissahickon Creek basin to address those stream segments impaired as a result of excess siltation. For siltation impaired stream segments, the TMDL has been established based on target load endpoints estimated from a reference unimpaired watershed. The TMDL found that sources of siltation are generally associated with nonpoint sources and wet weather streamflows. The TMDL mainly identifies two primary contributors to sediment in the Wissahickon Creek : (1) overland flow from urban stormwater runoff and (2) streambank erosion. The TMDL further states that "Because all of the Wissahickon Creek watershed is covered by MS4 stormwater permits, all sources of siltation to Wissahickon Creek and tributaries (i.e. overland flow and streambank erosion) are considered by EPA as point sources."

Whitpain Township, as a regulated MS4, is required to implement a TMDL Stormwater Plan through the National Pollutant Discharge Elimination System (NPDES) permitting program. The initial MS4 TMDL Strategy Plan for the Wissahickon Creek watershed was submitted with the permittee's MS4 NOI renewal in September 2012. The strategy plan has been revised in response to a review letter from PA DEP dated February 26, 2015. Per the TMDL regulations, a more detailed plan with design details shall be submitted at a later date.

## 2. WATERSHED INFORMATION

The watershed is known as the Wissahickon Creek watershed. The Wissahickon Creek drains approximately 64 square miles and extends 24.1 miles in a southeasterly direction through sixteen municipalities and boroughs including the City of Philadelphia. Major tributaries of the Wissahickon Creek basin include Sandy Run and Pine Run. Other tributaries include Trewellyn Creek, Willow Run East, Willow Run West, Rose Valley, Paper Mill Run, Creshiem Creek, Monoshone Creek, Prophecy Creek, Lorraine Run, Wisers Mill and Valley Road tributary.

In Whitpain Township, the main stem of the Wissahickon Creek extends 2.05 miles. The main tributaries of the Wissahickon Creek in Whitpain Township are the Willow Run West, Prophecy Creek and Rose Valley Creek. The Willow Run West and Prophecy Creek tributaries are not listed on the PA DEP 303(d) list for siltation and, therefore, are not considered impaired for siltation. The drainage area of the Wissahickon Creek within Whitpain Township is 5.22 square miles.

**Hydrologic Unit Code (HUC) for the Wissahickon Creek: 02040203**

A map of the Wissahickon watershed may be found on the next page.

Nutrient and Siltation TMDL Development for Wissahickon Creek, Pennsylvania

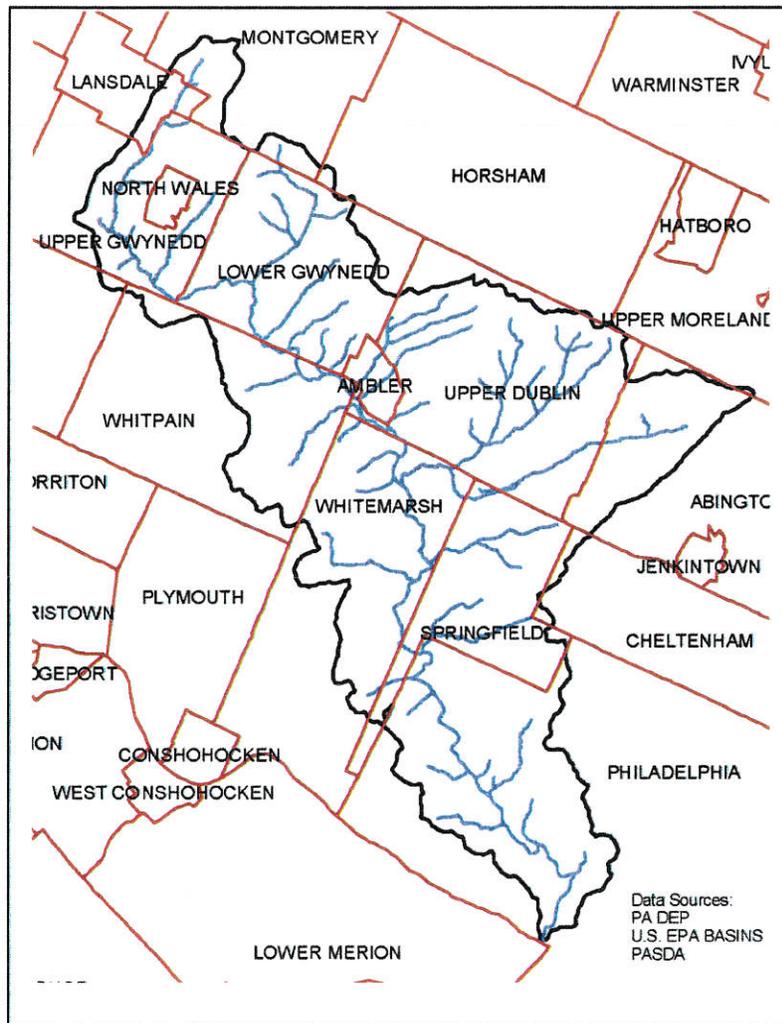


Figure 2-2. Municipal boundaries in the Wissahickon Creek watershed

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Source : "Nutrient and Siltation TMDL Development for Wissahickon Creek, Pennsylvania" prepared by US EPA, Region 3

### 3. POLLUTANT LIST and WLA's for TMDL

The following table summarizes the pollutant and Waste Load Allocations (WLA's) :

Municipality	Existing Load from Streambank Erosion (lbs/yr)	Streambank Erosion WLA (lbs/yr)	Percent Reduction for Streambank Erosion	Existing Overland Load (lbs/yr)	Overland Load WLA (lbs/yr)	Percent Reduction for Overland Load (lbs/yr)	TOTAL WLA (lbs/yr)
Ambler	17,974.49	9,346.73	0.48	75,008.50	32,843.24	0.56	42,189.97
Cheltenham	1,758.29	1,512.13	0.14	20,549.46	4,449.00	0.78	5,961.13
Horsham	2,611.24	1,267.20	0.51	5,764.44	2,288.51	0.60	3,555.71
Lansdale	10,032.37	5,216.83	0.48	60,295.96	47,115.59	0.22	52,332.43
Lower	168,245.82	87,487.83	0.48	575,510.64	349,872.50	0.39	437,360.30
Montgomery	25,443.78	13,230.77	0.48	135,550.26	97,897.57	0.28	111,128.30
North Wales	8,414.77	4,375.68	0.48	50,070.60	37,955.87	0.24	42,331.55
Philadelphia	133,827.01	115,091.23	0.14	1,413,863.47	265,770.10	0.81	380,861.30
Springfield	51,241.03	38,361.29	0.25	700,517.47	151,803.80	0.78	190,165.00
Upper Dublin	350,903.91	131,125.58	0.63	906,098.66	333,482.10	0.63	464,607.60
Upper	73,016.96	37,968.82	0.48	695,874.85	512,615.60	0.26	550,584.30
Upper	1,108.17	366.85	0.67	1,303.29	494.72	0.62	861.57
Whitemarsh	79,221.96	51,034.76	0.36	479,266.95	188,497.70	0.61	239,532.40
Whitpain	105,137.80	55,148.05	0.48	357,776.46	236,125.20	0.34	291,273.30
Worcester	1,423.06	739.99	0.48	10,644.84	9,610.08	0.10	10,350.07

The WLA for the municipalities identified above is the summation of the stream bank erosion and overland flow components identified in Table 4-12.

Source : "Nutrient and Siltation TMDL Development for Wissahickon Creek, Pennsylvania" prepared by US EPA, Region 3

#### 4. WISSAHICKON CREEK WATERSHED MUNICIPALITIES SUBJECT to the TMDL

Whitpain Township is within the Wissahickon Creek watershed and, therefore, is subject to the requirements of the TMDL study, "**Nutrient and Siltation TMDL Development for Wissahickon Creek, Pennsylvania**". The following municipalities are within the Wissahickon Creek watershed and are subject to the TMDL:

Montgomery Township  
Lansdale Borough  
Upper Gwynedd Township  
North Wales Borough  
Worcester Township  
Horsham Township  
Lower Gwynedd Township  
Ambler Borough  
Whitpain Township  
Upper Moreland Township  
Upper Dublin Township  
Abington Township  
Whitemarsh Township  
Springfield Township  
Cheltenham Township  
City of Philadelphia

## 5. WISSAHICKON CREEK WATERSHED COUNTIES SUBJECT to the TMDL

The following counties are within the Wissahickon Creek watershed and are subject to the requirements of the TMDL study, **“Nutrient and Siltation TMDL Development for Wissahickon Creek, Pennsylvania”**.

Montgomery County

Philadelphia County

## 6. ALLOCATED POLLUTANT LOADINGS

The allocated pollutant loadings are from the TMDL study entitled "Nutrient and Siltation TMDL Development for Wissahickon Creek, Pennsylvania". The TMDL was prepared by the United States Environmental Protection Agency, Region 3, 1650 Arch Street, Philadelphia, PA.

For Whitpain Township, the existing sediment loadings and allocated waste loads are split into two categories, Streambank Erosion and Overland Flow, and are as follows,

Existing Load From Streambank Erosion (lbs./yr.) = 105,137.80  
Streambank Erosion Waste Load Allocation (lbs./yr.) = 55,148.05

Existing Overland Flow Load (lbs./yr.) = 357,776.46  
Overland Flow Waste Load Allocation (lbs./yr.) = 236,125.20

Total Sediment Load (lbs./yr.) = 462,914.26  
Total Sediment Waste Load Allocation (lbs./yr.) = 291,273.30

The following method was implemented by Whitpain Township to delineate the MS4 TMDL Area of Responsibility. This methodology is in compliance with the Land Area Approach as detailed in the draft guidelines published by PA DEP titled "Parsing MS4 Wasteload Allocations from TMDL's". The method used resulted in a recalculation of the MS4 TMDL Area of Responsibility, MS4 Waste Load Allocations and MS4 Waste Load Reductions for sediment removal.

Based on a detailed analysis of the Township Wissahickon Creek MS4 TMDL sub-basin and available topographic data, storm sewer system mapping data and other GIS data, it has been determined that the **overall Wissahickon Creek MS4 TMDL Area of Responsibility for Whitpain Township is 66.15% of the overall Wissahickon Creek Drainage Area located within Whitpain Township.** Please note, the calculated percentage for the overall Wissahickon Creek watershed includes three large parcels that will be included in the MS4 TMDL Area of Responsibility as part of a partnership with Whitpain Township. More detailed information on the calculation procedure including detailed drainage maps for the Township MS4 TMDL Area of Responsibility may be found in Appendix A.

As a result of the new area of responsibility and the adjustment of the loadings and waste load allocations, new load reductions were determined. The following loadings and WLA's will be required based on the recalculated Township TMDL Area of Responsibility:

Township MS4 Existing Load From Streambank Erosion (lbs./yr.) = 69,548.65  
Township MS4 Streambank Erosion Waste Load Allocation (lbs./yr.) = 36,480.44

Township MS4 Existing Load From Overland Flow (lbs./yr.) = 236,669.13  
Township MS4 Overland Flow Waste Load Allocation (lbs./yr.) = 156,196.82

TOTAL Waste Load Allocation (lbs./yr.) for entire Wissahickon Creek watershed in Whitpain Township = 291,273.30

**TOTAL Waste Load Allocation (lbs./yr.) for Whitpain Township Wissahickon Creek MS4 TMDL Area of Responsibility portion of Wissahickon Creek = 192,677.29**

## 7. REDUCTIONS in POLLUTANT LOADINGS

The reductions in pollutant loadings are from the TMDL study entitled "Nutrient and Siltation TMDL Development for Wissahickon Creek, Pennsylvania". The TMDL was prepared by the United States Environmental Protection Agency, Region 3, 1650 Arch Street, Philadelphia, PA.

### STREAMBANK EROSION LOAD

Existing Load From Streambank Erosion (lbs./yr.) = 105,137.80

Streambank Erosion Waste Load Allocation (lbs./yr.) = 55,148.05

Given that 66.15% of the overall Wissahickon Creek watershed is within the Township Wissahickon Creek MS4 TMDL Area of Responsibility, the following loadings and WLA's will be required:

Township MS4 Existing Load From Streambank Erosion (lbs./yr.) = 69,548.65

Township MS4 Streambank Erosion Waste Load Allocation (lbs./yr.) = 36,480.44

Therefore, a 48% REDUCTION IN POLLUTANT LOADINGS for Streambank Erosion (33,068.21 lbs./yr.)

### OVERLAND FLOW LOAD

Existing Overland Flow Load (lbs./yr.) = 357,776.46

Overland Load Waste Load Allocation (lbs./yr.) = 236,125.20

Given that 66.15% of the overall Wissahickon Creek watershed is within the Township Wissahickon Creek MS4 TMDL Area of Responsibility, the following loadings and WLA's will be required:

Township MS4 Existing Load From Overland Flow (lbs./yr.) = 236,669.13

Township MS4 Overland Flow Waste Load Allocation (lbs./yr.) = 156,196.82

Therefore, a 34% REDUCTION IN POLLUTANT LOADINGS for Overland Flow (80,472.31 lbs./yr.)

**TOTAL REDUCTION in POLLUTANT LOADINGS = 37%**

## 8. MS4 TMDL IMPLEMENTATION PLAN

Whitpain Township has established a MS4 TMDL implementation plan to comply with the requirements of the Wissahickon Creek TMDL. Since October 2003, the Township and other regulatory agencies have installed BMP control measures within the Township's MS4 Area of Responsibility for the Wissahickon Creek watershed to address the requirements of the TMDL. These TMDL control measures reduce the sediment loading on the creek and are assisting Whitpain Township in meeting the pollutant reductions as specified in the TMDL. All of the control measures have been installed in accordance with guidance provided by the Pennsylvania Stormwater Best Management Practices Manual prepared by the Pennsylvania Department of Environmental Protection.

As part of developing our implementation plan, staff calculated the Township's MS4 drainage area and the Township's Area of Responsibility within the Wissahickon Creek watershed. From the calculated MS4 Area of Responsibility, Township staff determined the required pollutant reductions that are the responsibility of Whitpain Township. The Township MS4 Area of Responsibility encompasses 66.15% of the entire drainage area of the Wissahickon Creek watershed in Whitpain Township. Township staff analyzed the required pollutant reductions to ensure that the proper BMP control measures were implemented to maximize the overall operation of the improvements. BMP control measures were selected based on their overall efficiency, ownership, estimated cost, location within the watershed, hydrology/topography, access and other relevant parameters. Township staff also prioritized the selection of BMP control measures in order to address the sediment reductions as detailed for both streambank erosion as well as overland flow in the TMDL.

Whitpain Township also plans on implementing a public education/ public outreach component with all of the BMP control measure installations. The projects will utilize innovative methods to promote their benefits to the watershed. For example at one of the basin retrofit projects, a proposed trail extension will be constructed with benches and educational signage to allow the public to observe the completed project and learn about the basin's environmental benefits. In addition, the Township plans on promoting the projects through various media: Township website, local newspapers, printed Township newsletters, weekly electronic "Wire" newsletters, Twitter, and other social media.

With the requirement that Whitpain Township reduce the overall pollutant loadings for sediment by 37% within the Township's MS4 Area of Responsibility for the

Wissahickon Creek watershed, the Township's required pollutant reductions for sediment (TSS) will be 113,540.52 lbs./year. This breaks down to 33,068.21 lbs./year for the sediment associated with streambank erosion and 80,472.31 lbs./year for the sediment associated with overland flow.

## PRIORITIES FOR IMPLEMENTATION

The selection of BMP control measures as required for the Wissahickon Creek MS4 TMDL have been prioritized as follows:

1. BMP's located on land owned by Whitpain Township that discharge into the Regulated MS4 system and reduce the discharge volume, rate of runoff or sediment to the tributary/creek receive priority level #1.
2. BMP's located on parcels owned by entities that have entered into or will enter into a partnership with Whitpain Township. The BMP's must also discharge within the MS4 TMDL Area of Responsibility and reduce the discharge volume, rate of runoff or sediment to the tributary/creek. These projects receive a priority level #2.
3. BMP's located on private land that discharge into the Regulated MS4 system and reduce the discharge volume, rate of runoff or sediment to the tributary/creek receive priority level #3.

Whitpain Township will enter into easement or ownership agreements with the private property owner or partnership property owner to ensure that all BMP's are operated and maintained in accordance with their approved operations and maintenance plans to guarantee the performance stated in the MS4 TMDL strategy plan or subsequent design detail plans. These agreements will document Township responsibilities to ensure adequate long term operation and maintenance of BMP's and their associated systems.

## LIST OF ALREADY IMPLEMENTED BMP CONTROL MEASURES

### Basin Retrofit to Naturalized Infiltration Basin - Valentine Estates Neighborhood (Miles Drive) Detention Basin #1 - #PR-64

In 2010, Whitpain Township constructed a stormwater basin retrofit BMP within the Prophecy Creek watershed that drains into the Wissahickon Creek. The basin is located near the intersection of Lewis Lane and Miles Drive in the Valentine Estates subdivision. The detention basin was retrofitted from a dry bottom detention basin to a naturalized infiltration basin. The retrofit included the installation of infiltration pits, naturalized grasses/landscaping and a new outlet structure. In

addition, the discharge channel from the basin was armored to minimize downstream erosion. The basin controls a sixteen (16) acre drainage area within the Valentine Estates subdivision. The drainage area is entirely comprised of residential land uses with impervious surfaces related to roadways, driveways and residential structures. The basin's drainage area receives approximately ten inches of runoff each year (based on NRCS runoff equations). To determine the overland sediment loading for the basin's drainage area, the event mean concentrations (EMC) data from the PA DEP BMP Manual was consulted. From the calculated sediment loading for the basin's drainage area, we referred to Appendix A of the PA DEP BMP Manual for the estimated removal efficiencies for the selected BMP. For a basin retrofit, Appendix A states that an infiltration basin has a removal efficiency of 85% for total suspended solids (TSS) with the existing basin operating at a 10% removal efficiency for TSS. As a result, we calculated that the detention basin retrofit project removes 4,535 pounds of sediment (TSS) per year.

An operations and maintenance plan is in place for this project to ensure that the effectiveness of the BMP is maintained. Attached in the Appendix of the report is a copy of the approved Operations and Maintenance Plan for the retrofitted Valentine Estates detention basin. This control measure addresses 5.6% of the required pollutant reductions for sediment from overland flow required by the TMDL. Moreover, it addresses 4.0% of the total pollutant reduction for sediment as required by the TMDL. More detailed calculations on the sediment reductions calculated for this BMP control measure are contained in Appendix B.

Streambank Stabilization along Rose Valley Creek and Wissahickon Creek –  
Adjacent Wissahickon Park, Whitpain Township as part of EPA Superfund Program

US EPA as part of a removal action program stabilized 710 linear feet of streambank located along the Rose Valley Creek (tributary to the Wissahickon Creek) in 2011 and 1,300 linear feet of streambank located along the main stem of the Wissahickon Creek in 2009. This work was not mandated by Federal, State or Township stormwater regulations including NPDES permitting requirements. The streambank stabilization was constructed entirely within a Whitpain Township owned parcel formerly known as Wissahickon Park. The control measure included the installation of geotextile material from the toe of the bank to one foot above the 100 year floodplain elevation, installation of geocells along the slope of the Wissahickon Creek to the top of the embankment and installation of rip-rap stone at the bottom of the Wissahickon Creek embankment. The streambank stabilization work was completed in the spring of 2009. This project has resulted in a significant reduction in streambank erosion along the Wissahickon Creek.

This control measure addresses 100% of the required pollutant reductions for sediment from streambank erosion required by the TMDL. Moreover, it addresses 29% of the total pollutant reduction for sediment as required by the TMDL. More detailed plans and calculations on the sediment reductions calculated for this BMP control measure are contained in Appendix C.

## LIST OF BMP CONTROL MEASURES TO BE IMPLEMENTED

### Basin Retrofit to Naturalized Infiltration Basin - Village Circle Neighborhood Detention Basin - #WR-55 (Scheduled for Construction in 2016)

(Priority Level #1)

Whitpain Township will be constructing a stormwater basin retrofit in the Village at Blue Bell subdivision in the Spring of 2016. The basin is located near the cul-de-sac on Village Circle and is located within the Willow Run West watershed which drains in to the Wissahickon Creek. The land that the basin resides on is owned by Whitpain Township and the basin is currently operated and maintained by Whitpain Township. The existing detention basin is a dry bottom basin and will be retrofitted to a naturalized condition with a new outlet structure and infiltration capabilities. The basin has a drainage area of approximately 46 acres. It is anticipated that the BMP control measure will be installed by 2016. An operations and maintenance plan will be included for this project to ensure that the effectiveness of the BMP is maintained. In addition, the Township has applied for a public education/ public outreach grant from DCED in order to install a trail extension, benches and educational signage at the project site. These improvements will allow the Township to promote the environmental benefits of the basin retrofit project to the community.

This control measure will address 12.2% of the required pollutant reductions for sediment from overland flow required by the TMDL. Moreover, it will address 8.7% of the total pollutant reduction for sediment as required by the TMDL. More detailed calculations on the sediment reductions anticipated for this BMP control measure installation are contained in Appendix B.

### Basin Retrofit to Naturalized Infiltration Basin - Valentine Estates Neighborhood (Lewis Lane) Detention Basin #2 - #PR-63 (Scheduled for Construction in 2018)

(Priority Level #1)

Whitpain Township will plan, design and construct a stormwater basin retrofit in the Valentine Estates subdivision in 2018. The basin is located between Miles Drive and Lewis Lane and it is located within the Prophecy Creek watershed which drains to the Wissahickon Creek. The land that the basin resides on is owned by Whitpain Township and the basin is currently operated and maintained by Whitpain Township. The detention basin is a dry bottom basin and will be retrofitted to a naturalized condition with a new outlet structure and infiltration capabilities. The basin has a drainage area of approximately 54 acres. It is anticipated that the BMP control measure will be installed by 2018. An operations and maintenance plan will be included for this project to ensure that the effectiveness of the BMP is maintained.

This control measure will address 18.9% of the required pollutant reductions for sediment from overland flow required by the TMDL. Moreover, it will address 13.3% of the total pollutant reduction for sediment as required by the TMDL. More detailed calculations on the sediment reductions anticipated for this BMP control measure installation are contained in Appendix B.

Streambank Restoration/Stabilization Project - Cedarbrook Country Club/Whitpain Township (Scheduled for Construction in 2018-2021)

(Priority Level #2)

Whitpain Township is partnering with Cedarbrook Country Club to install streambank restoration/stabilization improvements along the Wissahickon Creek. The project will implement BMP control measures to address 4,100 linear feet of streambank along the Wissahickon Creek. The improvements include redirective measures, soil wrap, flood control, bank restoration, biolog and rip-rap installation as well as bank stabilization on the tributaries draining to the creek. The Township will be providing a 15% funding match for the project. Whitpain Township in conjunction with Cedarbrook Country Club has submitted a grant application to the Commonwealth Financing Authority's Flood Mitigation Program for the balance of the project's cost. Attached in Appendix C is a copy of the cover letter and application to the CFA.

Presently, the Wissahickon Creek is experiencing significant streambank erosion at the project location as well as on adjoining properties, resulting in increased sediment bed load; clogging of the stream channel; and flooding that damages public and private property. Through restoration and stabilization of the streambank, the work to be carried out under this proposal would mitigate erosion, flooding and

nonpoint source pollution in the project location as well as downstream in West Ambler.

Restoration and stabilization of the Wissahickon streambank in the project area will be achieved by several key elements as part of a multi-year, multi-phase Master Plan. The four phases of the project are shown below.

Phase 1: Redirective Measures – installation of rock vanes and stone toe protection

Phase 2: Flood Control and Bank Restoration – installation of erosion control matting and erosion resistant plant materials

Phase 3 – Biolog and Rip-Rap Corrective Work – installation of coconut fiber logs and erosion resistant plant materials

Phase 4 – Tributary Bank Stabilization – installation of stonecross vanes and plant plugs

This control measure will address 100% of the required pollutant reductions for sediment from overland flow required by the TMDL. Moreover, it will address 29% of the total pollutant reduction for sediment as required by the TMDL. More detailed plans and calculations on the sediment reductions anticipated for this BMP control measure installation are contained in Appendix C.

Basin Retrofit to Naturalized Extended Detention Basin - Wings Field Parcel (Dundee Drive – Northern portion) Detention Basin - #PR-81 (Scheduled for Construction in 2021)

(Priority Level #1)

Whitpain Township will plan, design and construct a stormwater basin retrofit located on the Wings Field parcel in 2021. The basin is located near Dundee Drive and it is located within the Prophecy Creek watershed which drains to the Wissahickon Creek. The land that the basin resides on is currently owned by Wings Field Preservation Associates LP (WFPA) and the basin is currently operated and maintained by WFPA. There are currently plans under way for Whitpain Township to obtain an easement for this basin in order to provide operations and maintenance for the basin. The detention basin is a dry bottom basin and will be retrofitted to a naturalized condition with a new outlet structure and extended detention capabilities. The basin has a drainage area of approximately 57 acres. It is anticipated that the BMP control measure will be installed by 2021. An operations and maintenance plan will be included for this project to ensure that the

effectiveness of the BMP is maintained. This control measure will address 12.3% of the required pollutant reductions for sediment from overland flow required by the TMDL. Moreover, it will address 8.7% of the total pollutant reduction for sediment as required by the TMDL. More detailed calculations on the sediment reductions anticipated for this BMP control measure installation are contained in Appendix B.

Basin Retrofit to Naturalized Infiltration Basin - Ridings Neighborhood (Ridings Way - Middle) Detention Basin - #PR-72 (Scheduled for Construction in 2024)

(Priority Level #3)

Whitpain Township will plan, design and construct a stormwater basin retrofit in the Ridings of Whitpain subdivision in 2024. The basin is located in the middle of the neighborhood near Ridings Way and it is located within the Prophecy Creek watershed which drains to the Wissahickon Creek. The land that the basin resides on is owned by the Homeowners Association (HOA) for the Ridings subdivision and the basin is currently operated and maintained by the HOA. The Township plans on entering into an easement agreement with the HOA in order to ensure long term operations and maintenance of the BMP control measure. The detention basin is a dry bottom basin and will be retrofitted to a naturalized condition with a new outlet structure and infiltration capabilities. The basin has a drainage area of approximately 45 acres. It is anticipated that the BMP control measure will be installed by 2024. An operations and maintenance plan will be included in this project to ensure that the effectiveness of the BMP is maintained. This control measure will address 15.2% of the required pollutant reductions for sediment from overland flow required by the TMDL. Moreover, it will address 10.8% of the total pollutant reduction for sediment as required by the TMDL.

Basin Retrofit to Naturalized Infiltration Basin - Windermere Neighborhood Detention Basin - #WC-4 (Scheduled for Construction in 2027)

(Priority Level #3)

Whitpain Township will plan, design and construct a stormwater basin retrofit in the Windermere subdivision in 2027. The basin is located at the rear of the entire neighborhood between Windermere Drive and Township Line Road (north) and its discharge flows drain directly to the Wissahickon Creek. The land that the basin resides on is owned by the Homeowners Association (HOA) for the Windermere subdivision and the basin is currently operated and maintained by the HOA. The Township plans on entering into an easement agreement with the HOA in order to ensure long term operations and maintenance of the BMP control measure. The

The detention basin is a dry bottom basin and will be retrofitted to a naturalized condition with a new outlet structure and infiltration capabilities. The basin has a drainage area of approximately 61 acres. It is anticipated that the BMP control measure will be installed by 2027. An operations and maintenance plan will be included in this project to ensure that the effectiveness of the BMP is maintained. This control measure will address 18.7% of the required pollutant reductions for sediment from overland flow required by the TMDL. Moreover, it will address 13.3% of the total pollutant reduction for sediment as required by the TMDL. More detailed calculations on the sediment reductions anticipated for this BMP control measure installation are contained in Appendix B.

Basin Retrofit to Naturalized Infiltration Basin - Pheasant Meadow Neighborhood Detention Basin - #WC-40 or Wings Field Eastern (Narcissa Road) Detention Basin - #PR-86 (Scheduled for Construction in 2030)

(Priority Level #3)

The last basin to be retrofitted as part of our MS4 TMDL Strategy Plan will be selected from two potential candidates. The basin will be selected based on ownership opportunities, cost, watershed location, and potential for sediment reductions. Whitpain Township will plan, design and construct a stormwater basin retrofit located in the Pheasant Meadow neighborhood or on the Wings Field parcel in 2030. The Pheasant Meadow basin is located along Pheasant Meadow Drive and its discharge flows drain directly to the Wissahickon Creek. The Wings detention basin is located near Narcissa Road and it is located within the Prophecy Creek watershed which drains to the Wissahickon Creek. The land that the Pheasant Meadow basin resides on is privately owned by the adjacent property owners and they are also responsible for operations and maintenance. The land that the Wings Field basin resides on is currently owned by Wings Field Preservation Associates LP (WFPA) and the basin is currently operated and maintained by WFPA. Both basins are dry bottom basins and they will be retrofitted to a naturalized condition with a new outlet structure and infiltration capabilities. More detailed calculations on the sediment reductions anticipated for these BMP control measures are contained in Appendix B.

## 9. ANALYSIS of MS4 TMDL IMPLEMENTATION PLAN

Whitpain Township conducted an analysis of the TMDL implementation plan for conformance with the requirements of the Wissahickon Creek TMDL. The Township believes that the implementation plan demonstrates measurable progress towards meeting the pollutant reduction requirements as set forth in the TMDL. Given the existing BMP control measures already in place and the implementation plan that proposes the installation of streambank restoration/stabilization improvements and the construction of seven (7) stormwater basin retrofits, the Township will be addressing the sediment reduction requirements as mandated in the Wissahickon Creek Sediment TMDL. A table showing the total sediment reductions based on the existing and proposed BMP Control Measures may be found on the next page.

The estimated end date for ultimate attainment given Whitpain Township's MS4 TMDL Implementation Plan and the associated pollutant reductions listed in our plan will be approximately twelve to fifteen years from the PA DEP plan approval date. Based upon the sediment reduction estimates contained in this MS4 TMDL Strategy Plan, we expect significant sediment reductions within the next permit cycle, but we do not expect to achieve full compliance with the WLA until between 2028 and 2031. This timeline is subject to change given the nature of the proposed control measures. The Township will revise the MS4 TMDL Strategy Plan to reflect any modifications to our implementation plan.

Whitpain Township has already installed some control measures to address the requirements of the Wissahickon Creek TMDL. These control measures will be monitored on an as needed basis to verify that they continue to operate as designed and provide the necessary pollutant reductions. The Township has operations and maintenance plans in effect for these control measures to ensure their long term effectiveness. Attached in the Appendix of the report is a copy of the approved Operations and Maintenance Plan for the retrofitted Valentine Estates detention basin.

Whitpain Township will report on our progress related to the MS4 TMDL Implementation Plan in all periodic reports as necessary.

BASIN RETROFIT BMP CONTROL MEASURES					
#	NAME	DRAINAGE AREA(acres)	SEDIMENT LOADING (LBS/YR)	EFFICIENCY (%)	SEDIMENT REDUCTION (LBS/YR)
PR-64	Valentine Estates (Miles Drive)	16.23	6046.8	75	4,535
WR-55	Village Circle Basin	59.67	13,135.95	75	9,852
PR-63	Valentine Estates (Lewis Lane)	54	20194.02	75	15,416
PR-81	Wings Field (Dundee)	57.2	19,835.10	50	9,918
PR-72	Ridings (Hunters Run)	45.2	16,728.55	75	12,209
WC-4	Windermere (Normandy)	60.83	20,064.78	75	15,049
PR-86	Wings Field (Narcissa)	42.34	20,541.20	75	15,406

**TOTAL SEDIMENT REDUCTION (LBS/YR) = 82,385**

STREAMBANK RESTORATION AND STABILIZATION				
#	NAME	LENGTH (ft)	*SEDIMENT REMOVAL RATE (lb/ft)	SEDIMENT REDUCTION (lbs/yr)
1	Cedarbrook Country Club	4,100	248	1,016,800
2	Rose Valley Creek	710	248	176,080
3	Wissahickon Creek	1,300	248	322,400

**TOTAL SEDIMENT REDUCTION (LBS/YR) = 1,515,280**

\* Sediment Removal Rate was obtained from the PaDEP TMDL Training Seminar in March, 2015. In the training seminar workbook it is listed as the Interim Removal Rate for Edge of Field.

## 10. PUBLIC PARTICIPATION PLAN

As part of the preparation and submission requirements for the Wissahickon Creek MS4 TMDL Strategy Plan, PA DEP requires that the Township solicit public involvement and participation. The following requirements are part of the Whitpain Township Public Involvement and Participation Plan:

1. A complete copy of the Wissahickon Creek MS4 TMDL Strategy Plan for Whitpain Township is available for public review both at the Township Administration Office and online at the Township website, [www.whitpaintownship.net](http://www.whitpaintownship.net).
2. Publish, in a newspaper of general circulation in the area, a public notice containing a statement describing the Strategy, where it may be reviewed by the public, and the length of time provided for the receipt of comments.
3. Accept written comments for a minimum of thirty (30) days from the date of public notice.
4. Accept any verbal or written comments from any interested member of the public at a public meeting or hearing.
5. Consider and make a record of the consideration of each timely comment received from the public comment period concerning the Strategy, identifying any changes made to the Strategy in response to the comment.

Submission of the MS4 TMDL Strategy to PA DEP must include a copy of the newspaper notice, a copy of all written comments from the public and a copy of the record of consideration of all timely comments received in the public comment period. Documentation of public participation will be included in Appendix E.