Langhorne Manor Borough Stormwater Commission – Agenda & Minutes
Monday, August 22, 2022 at 7:30pm – Borough Hall

Attendees: Alicia Gasparovic (chair), Fred Tomlinson, Kevin Oessenich, Jim Keba, Dave Bean, Lauren Shuke, Jay Ferraro (Borough Manager), Dawn Seader (Council President), Isaac Kessler (RVE), Michael DeAngelis (RVE).

1. Approve July meeting minutes – approved with no changes

2. Discussion of swale project location options
(Isaac Kessler & Michael DeAngelis will assist with questions)

- Neshaminy Creek Watershed
- Mill Creek Watersheds
- Instead of summarizing the discussion here in the minutes, please refer to the various documents presented to SWC/council by RVE and the SWC chair. These documents are attached to these minutes and summarize the locations considered, pertinent aspects of each, and reasons for the final SWC recommendation.
- Other considerations discussed include:
    - Stitch cutting around driveways and trees tends to make swale projects significantly less viable (and also increases future maintenance of cleanouts) and should be avoided if possible.
    - Driveways needing to be cut across to install trenches/piping will be restored to previous condition.
    - It was noted that the topography of Prospect Ave means water would possibly drain in two different directions if an infiltration trench is installed there. RVE responded that this is okay and should not affect watershed credits.
    - Pine Street swale (805 S. Pine to Manor Ave) would possibly need to be split into 2 pieces depending on location of utilities. But since this location has preferred soils, there should be sufficient credits obtained if so.
    - Utility poles in project areas can be stabilized if needed during construction.
- Timeline items:
    - The 2022-2023 annual DEP report will include any approved MS4 plan changes (swales), and public comment will need to occur.
    - Comly Ave project still needs a public comment period as well once final plans are developed (est. end of 2022) so that construction can begin.
    - We may hear about the WRPP grant application towards the end of October.
- Other:
    - There is a new DEP specialist (Ricky) who is more thorough than the prior DEP point person.
    - Council president to consult with LMB solicitor on notification of impacted residents who may wish to attend the next council meeting, which is when the SWC will recommend to Council which projects to undertake.
    - RVE was asked by Borough Manager to draft resolution wording(s) for Council to approve the recommended projects so that RVE can start pursuing additional grant money and updating the MS4 plan.

3. Determine recommendation to Council

- Next Council meeting is Tuesday, September 13
- Isaac Kessler & Michael DeAngelis will again be present for questions

- SWC recommendation is to pursue Prospect Ave (Neshaminy Creek watershed) and Pine Street (Mill Creek watershed, 805 S. Pine to Manor Ave) swale conversion projects, which would convert current grassy swales into grass-covered infiltration trenches. Consensus reached on this recommendation by SWC members as well as RVE representatives.

4. Next meeting: Monday, September 19th (Noted that Council President and 2 SWC members may be unable to attend)

Minutes prepared by Alicia Gasparovic, Stormwater Commission chairperson

Stormwater Agenda Items for Council Approval:

1. Approve recommendation from LMB Stormwater Commission (SWC) & Remington Vernick Engineers (RVE) for 2 projects to convert current lengths of existing grassy swales into infiltration trenches to meet DEP MS4 obligations. (See next page for more information.)

2. Approve RVE to move forward in the pursuit of grant funding for infiltration trench projects, including assisting LMB SWC with application for Bucks Conservation District Gravel & Dirt Roads grant funding if applicable.

LMB Stormwater Commission Update & Recommendation for Next Steps
September 2022

DEP/MS4 REQUIRED SEDIMENT & POLLUTANT REDUCTIONS

- LMB has until 2024 to meet 10% reductions for both **Neshaminy Creek** (10,378 lbs/yr) and **Mill Creek** (7,326 lbs/yr).
- **Neshaminy Creek has an additional obligation** for 29.9% total reduction (total of 31,031 lbs/yr), recommended by RVE to be completed by 2029.

PROJECTS UNDERWAY

- The **Comly Ave** detention basin project is projected to provide 6,764 lbs/yr of reduction for the **Neshaminy Creek** watershed. Additional projects are needed to meet both the 2024 and 2029 goals for Neshaminy Creek.
- No projects are underway to meet the **Mill Creek** required reduction.

CLOSING THE GAP

- Together, RVE and the Stormwater Commission explored several potential projects, identifying options and locations that would both meet our 2024 DEP obligations and also limit the disruption of neighborhood assets. Projects focused on **conversion of existing swales/drainage ditches into infiltration trenches**. (Note that existing swales/drainage ditches may be rock-lined or grassy.)

- Some items considered include:
    - Preservation of characteristic rock-lined swales
    - Limiting the disturbance of trees and plantings, including root systems
    - Locations of unique structures such as stone mailboxes or walls
    - Locations of utility poles, lines, and structures
    - Drainage area and soil types, which affect available DEP reduction credits
    - Project costs, including relative "cost per credit"
    - Whether the project would satisfy the remaining DEP 2024 required reductions

- Locations considered:
    - **Neshaminy Creek Watershed:**
        - Highland Ave (South side of street, between Hill Ave and Hulmeville Ave)
        - W Prospect Ave (North side of street, between Station Ave and Hulmeville Ave)
        - Hill Ave (West side of street, between Highland Ave and Prospect Ave)
    - **Mill Creek Watershed:**
        - Pine St & E Park Ave (West side of Pine St, North side of E Park Ave)
        - Pine St (East side of street, between 805 Pine St and Manor Ave)

RECOMMENDATIONS

1. **Neshaminy Creek Watershed:** W Prospect Ave (North side of street, between Station Ave and Hulmeville Ave) – est. 6,774 lbs/yr, $412,613.
   Note: This location does not have the lowest "cost per credit" but was selected in part to preserve large shade trees and avoid utility poles.
2. **Mill Creek Watershed:** Pine St (East side of street, between 805 Pine St and Manor Ave) – est. 9,097 lbs/yr, $478,032.

MEMORANDUM

Date: August 15, 2022

To: Jay Ferraro, Borough Manager

Client: Langhorne Manor Borough

RVE Project #: PBLBT003

Re: Possible TMDL BMPs

Please note the following:

This memorandum is to determine appropriate Stormwater Best Management Practices to reach the reductions required by the Borough's approved plan for both Mill and Neshaminy Creek Watersheds.

According to the Borough's approved plan, it has until 2024 to meet their 10% MS4 reductions for both the Neshaminy Creek and Mill Creek.

- Mill Creek Sediment Pollutant Loadings to be reduced by **7,326 lbs/year**.
- Neshaminy Creek Sediment Pollutant Loadings to be reduced by **10,378 lbs/year** by 2024, however reductions needed to meet the WLA are 31,031 lbs/year. The approved plan did not commit to a timeframe to reach the WLA. RVE recommends the Borough aim to complete by the end of the next permit term (2029) to avoid compounding reduction requirements.

Current projections show that the Comly Avenue Stormwater Project (Comly) will provide 6,764 lbs/year of reduction. At the Stormwater Commission Meeting on July 25th, The Borough and RVE identified all the grass lined swales potential projects for the Mill Creek Watershed and the Neshaminy Creek Watershed. These grass lined swales consisted of:

- Highland Avenue Swale, in between Hill Avenue and Hulmeville Avenue
- W. Prospect Avenue Swale, in between Station Avenue and Hulmeville Avenue
- Hill Avenue Swale, in between Highland Avenue and Prospect Avenue
- Pine Avenue and Park Avenue Swales, converging at the corner of Park Avenue and Pine Avenue
- Pine Avenue Swale, in between 805 Pine Avenue and Manor Avenue

Please see the attached documents for the swales regarding existing soils, reduction credits, infiltration trench sizing, the volume total for each infiltration trench, volume of infiltration, and all costs associated with construction, design, and inspection. The attachments are listed as:

Attachment A – Photo Key of all Swale Options
Attachment B – Existing Soils Map of Borough
Attachment C – Reduction Credits for each Infiltration Trench
Attachment D – Infiltration Trench Volumes and Sizing

Attachment E – Associated Preliminary Cost Estimates

Overall, RVE recommends the W. Prospect Infiltration Trench, in between Station Avenue and Hulmeville Avenue, and the Pine Avenue Swale, in between 805 Pine Avenue and Manor Avenue, due to the ability for the swale to meet stormwater requirements and the ability to be meet the reductions requirements for the 2024 deadline. The potential cost for each of the projects will be highly dependent on the final design. Conceptual cost estimates for planning purposes are provided in Attacment E. These unit costs based on recent pricing for stormwater infrastructure and additional items that have recently been returned from bidding.

With a determination of a preferred approach to meeting the MS4 plan's reduction goals, we look forward to working with the Borough to identifying grant funding opportunities for these projects.

Should you have any questions or require any additional information, please contact our office at (267) 394-4500.

Sincerely,
REMINGTON & VERNICK ENGINEERS

for Isaac Kessler, PE, Associate
Borough MS4 Engineer
cc:

Michael DeAngelis, EIT, MS4 Program Lead
Vanessa Nedrick, PE, Regional Manager
Christopher J. Fazio, PE, CME, Executive Vice President

Attachment A

Picture 1: Highland Avenue Swale, in between Hill Avenue and Hulmeville avenue

Picture 2: Highland Avenue Swale, in between Hill Avenue and Hulmeville avenue

Picture 3: Highland Avenue Swale, in between Hill Avenue and Hulmeville avenue

Picture 4: West Prospect Avenue Swale, in between Station Avenue and Hulmeville Avenue

Picture 5: West Prospect Avenue Swale, in between Station Avenue and Hulmeville Avenue

Picture 6: West Prospect Avenue Swale, in between Station Avenue and Hulmeville Avenue

Picture 7: Hill Avenue Swale, in between Highland Avenue and Prospect Avenue

Picture 8: Hill Avenue Swale, in between Highland Avenue and Prospect Avenue

Picture 9: Park Avenue Swale, converging at the corner of Park Avenue and Pine Avenue

Picture 10: Park Avenue Swale, converging at the corner of Park Avenue and Pine Avenue

Picture 11: Park Avenue Swale, converging at the corner of Park Avenue and Pine Avenue

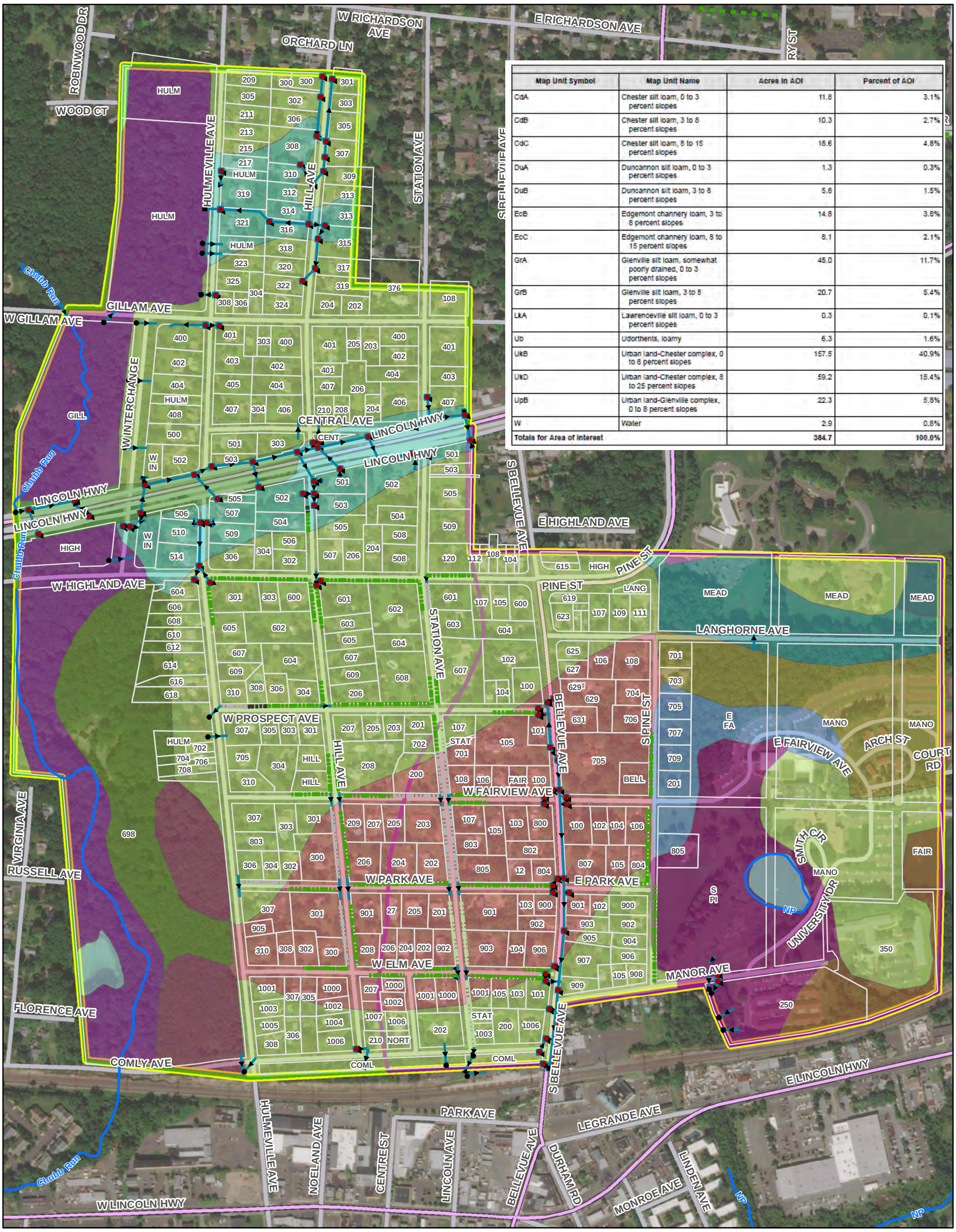
Picture 12: Pine Avenue Swale, converging at the corner of Park Avenue and Pine Avenue

Picture 13: Pine Avenue in between 805 Pine and Manor Ave

Picture 14: Pine Avenue and Park Swales, converging at the corner of Park Avenue and Pine Avenue

Attachment B

Langhorne Manor Borough Soils Map



Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CdA	Chester silt loam, 0 to 3 percent slopes	11.8	3.1%
CdB	Chester silt loam, 3 to 8 percent slopes	10.3	2.7%
CdC	Chester silt loam, 8 to 15 percent slopes	18.6	4.8%
DuA	Duncannon silt loam, 0 to 3 percent slopes	1.3	0.3%
DuB	Duncannon silt loam, 3 to 8 percent slopes	5.8	1.5%
EcB	Edgemont channery loam, 3 to 8 percent slopes	14.6	3.8%
EcC	Edgemont channery loam, 8 to 15 percent slopes	8.1	2.1%
GrA	Glenville silt loam, somewhat poorly drained, 0 to 3 percent slopes	45.0	11.7%
GrB	Glenville silt loam, 3 to 8 percent slopes	20.7	5.4%
LkA	Lawrenceville silt loam, 0 to 3 percent slopes	0.3	0.1%
Ub	Udorthents, loamy	6.3	1.6%
UkB	Urban land-Chester complex, 0 to 8 percent slopes	157.5	40.9%
UkD	Urban land-Chester complex, 8 to 25 percent slopes	59.2	15.4%
UpB	Urban land-Glenville complex, 0 to 8 percent slopes	22.3	5.8%
W	Water	2.9	0.8%
Totals for Area of Interest		384.7	100.0%

Legend

- Discharge Points
- Inlets
- Storm Network
- Grass Lined
- Other
- Rock Lined
- Rock and Grass Lined

CdA (A Soil), CdB (B Soil), CdC (C Soil), DuA (A Soil), DuB (B Soil), EcB (B Soil), EcC (C Soil), GrA (A Soil), GrB (B Soil), LkA (A soil), Ub (B Soil), UkB (B Soil), UkD (D Soil), UpB (B Soil), W (Water)

08/08/2022

SCALE: 1" = 500'

REMINGTON & VERNICK ENGINEERS
1010 STONY HILL ROAD, SUITE 175, YARDLEY, PA 19067
(267) 394-4500, FAX (267) 394-4501, WWW.RVE.COM
Certificate of Authorization: 24 GA 28003300
~ENGINEERING EXCELLENCE~

Attachment C

REMINGTON & VERNICK ENGINEERS

PROJECT:	Highland Avenue Infiltration Trench (between Hill and Hulmeville)		
SUBJECT:	BMP CREDIT CALCULATIONS		
SHEET:	1 OF 5	DATE:	8/3/2022
BY:	MAD		
CHK'D:	IK		

Drainage Area Name	Area (SF)	Impervious Area (SF)	Pervious Area (SF)
Highland Ave Trench DA	676,730.69	181,293.12	495,437.57

Soil Type
B

Drainage Area Name	Area (Ac.)	Impervious Area (Ac.)	Pervious Area (Ac.)
Highland Ave Trench DA	15.54	4.16	11.37

Drainage Area Name	Drainage Area (Ac.)	Impervious Area (Ac.)	Pervious Area (Ac.)	Impervious Sediment Loading Rate (lbs/acre)	Pervious Sediment Loading Rate (lbs/acre)	Pollutant Load TSS (lbs/year)
Highland Ave Trench DA	15.54	4.16	11.37	1,839.00	264.96	10,667.48

BMP Name	BMP Reduction	Sediment Reduction (lbs/year)
Highland Ave Infiltration Trench	95.00%	**10,134.11**

REMINGTON & VERNICK ENGINEERS

PROJECT:	W. Prospect Avenue Infiltration Trench (between Hill and Hulmeville)		
SUBJECT:	BMP CREDIT CALCULATIONS		
SHEET:	2 OF 5	DATE:	8/3/2022
BY:	MAD		
CHK'D:	IK		

Drainage Area Name	Area (SF)	Impervious Area (SF)	Pervious Area (SF)
W. Prospect Ave Trench DA	432,447.70	124,540.66	307,907.04

Soil Type
B

Drainage Area Name	Area (Ac.)	Impervious Area (Ac.)	Pervious Area (Ac.)
W. Prospect Ave Trench DA	9.93	2.86	7.07

Drainge Area Name	Drainage Area (Ac.)	Impervious Area (Ac.)	Pervious Area (Ac.)	Impervious Sediment Loading Rate (lbs/acre)	Pervious Sediment Loading Rate (lbs/acre)	Pollutant Load TSS (lbs/year)
W. Prospect Ave Trench DA	9.93	2.86	7.07	1,839.00	264.96	7,130.62

BMP Name	BMP Reduction	Sediment Reduction (lbs/year)
W. Prospect Ave Infiltration Trench	95.00%	**6,774.09**

REMINGTON & VERNICK ENGINEERS

PROJECT:	Hill Avenue Infiltration Trench (between Highland and Prospect)		
SUBJECT:	BMP CREDIT CALCULATIONS		
SHEET:	3 OF 5	DATE:	8/3/2022
BY:	MAD		
CHK'D:	IK		

Drainage Area Name	Area (SF)	Impervious Area (SF)	Pervious Area (SF)
Hill Ave Trench DA	189,808.32	46,160.10	143,648.22

Soil Type
B

Drainage Area Name	Area (Ac.)	Impervious Area (Ac.)	Pervious Area (Ac.)
Hill Ave Trench DA	4.36	1.06	3.30

Drainge Area Name	Drainage Area (Ac.)	Impervious Area (Ac.)	Pervious Area (Ac.)	Impervious Sediment Loading Rate (lbs/acre)	Pervious Sediment Loading Rate (lbs/acre)	Pollutant Load TSS (lbs/year)
Hill Ave Trench DA	4.36	1.06	3.30	1,839.00	264.96	2,823.02

BMP Name	BMP Reduction	Sediment Reduction (lbs/year)
Hill Ave Infiltration Trench	95.00%	**2,681.87**

REMINGTON & VERNICK ENGINEERS

PROJECT:	Pine Avenue Infiltration Trenches (between Fairview and Park)		
SUBJECT:	BMP CREDIT CALCULATIONS		
SHEET:	4 OF 5	DATE:	8/3/2022
BY:	MAD		
CHK'D:	IK		

Drainage Area Name	Area (SF)	Impervious Area (SF)	Pervious Area (SF)
Pine Ave Trench DA	506,208.42	102,562.13	403,646.29

Soil Type
D

Drainage Area Name	Area (Ac.)	Impervious Area (Ac.)	Pervious Area (Ac.)
Pine Ave Trench DA	11.62	2.36	9.27

Drainge Area Name	Drainage Area (Ac.)	Impervious Area (Ac.)	Pervious Area (Ac.)	Impervious Sediment Loading Rate (lbs/acre)	Pervious Sediment Loading Rate (lbs/acre)	Pollutant Load TSS (lbs/year)
Pine Ave Trench DA	11.62	2.36	9.27	1,839.00	264.96	6,785.96

BMP Name	BMP Reduction	Sediment Reduction (lbs/year)
Pine Ave Infiltration Trench	70.00%	**4,750.17**

REMINGTON & VERNICK ENGINEERS

PROJECT:	Pine Avenue Infiltration Trenches (between 805 Pine and Manor)		
SUBJECT:	BMP CREDIT CALCULATIONS		
SHEET:	5 OF 5	DATE:	8/3/2022
BY:	MAD		
CHK'D:	IK		

Drainage Area Name	Area (SF)	Impervious Area (SF)	Pervious Area (SF)
Pine Ave Trench DA	734,138.49	179,742.43	554,396.06

Soil Type
B & C

Drainage Area Name	Area (Ac.)	Impervious Area (Ac.)	Pervious Area (Ac.)
Pine Ave Trench DA	16.85	4.13	12.73

Drainge Area Name	Drainage Area (Ac.	Impervious Area (Ac.)	Pervious Area (Ac.)	Impervious Sediment Loading Rate (lbs/acre)	Pervious Sediment Loading Rate (lbs/acre)	Pollutant Load TSS (lbs/year)
Pine Ave Trench DA	16.85	4.13	12.73	1,839.00	264.96	10,960.01

BMP Name	BMP Reduction	Sediment Reduction (lbs/year)
Pine Ave Infiltration Trench	83.00%	**9,096.81**

Attachment D

REMINGTON & VERNICK ENGINEERS

PROJECT:	Infiltration Trench Sizing			
SUBJECT:	PRELIMINARY BMP SIZING			
SHEET:	1	OF	1	DATE: 8/3/2022
BY:	MAD			
CHK'D:	IK			

BMP Name	Area (SF)	Impervious Area (SF)	Storage Volume (Rv) (cf)	Stone Voids (%)	Length (ft)	Width (ft)	Depth(ft)	Trench Volume (cf)	Infiltration Volume (cf)	Filtered Volume (cf)
Highland Ave Infiltration Trench	676,730.69	181,293.12	30,215.52	40%	500.00	8.00	6.00	**9,600.00**	**7,200.00**	**2,400.00**

BMP Name	Area (SF)	Impervious Area (SF)	Storage Volume (Rv) (cf)	Stone Voids (%)	Length (ft)	Width (ft)	Depth(ft)	Trench Volume (cf)	Infiltration Volume (cf)	Filtered Volume (cf)
W. Prospect Ave Infiltration Trench	432,447.70	124,540.66	20,756.78	40%	1,100.00	8.00	6.00	**21,120.00**	**15,840.00**	**5,280.00**

BMP Name	Area (SF)	Impervious Area (SF)	Storage Volume (Rv) (cf)	Stone Voids (%)	Length (ft)	Width (ft)	Depth(ft)	Trench Volume (cf)	Infiltration Volume (cf)	Filtered Volume (cf)
Hill Ave Infiltration Trench	189,808.32	46,160.10	7,693.35	40%	450.00	8.00	6.00	**8,640.00**	**6,480.00**	**2,160.00**

BMP Name	Area (SF)	Impervious Area (SF)	Storage Volume (Rv) (cf)	Stone Voids (%)	Length (ft)	Width (ft)	Depth(ft)	Trench Volume (cf)	Infiltration Volume (cf)	Filtered Volume (cf)
Pine Ave Infiltration Trench	506,208.42	102,562.13	17,093.69	40%	880.00	8.00	6.00	**16,896.00**	**12,672.00**	**4,224.00**

BMP Name	Area (SF)	Impervious Area (SF)	Storage Volume (Rv) (cf)	Stone Voids (%)	Length (ft)	Width (ft)	Depth(ft)	Trench Volume (cf)	Infiltration Volume (cf)	Filtered Volume (cf)
Pine Ave Infiltration Trench (2)	734,138.49	179,742.43	29,957.07	40%	750.00	8.00	6.00	**14,400.00**	**10,800.00**	**3,600.00**

Volume Reduction Calculations

Volume = Depth* (ft) x Area (sf) x Void Space

*Depth is the depth of the water surface during a storm event, depending on the drainage area and conveyance to the bed.

Infiltration Volume = Bed Bottom Area (sf) x Infiltration design rate (in/hr) x Infiltration period* (hr) x (1/12)

*Infiltration Period is the time when bed is receiving runoff and capable of infiltration. Not to exceed 72 hours.

Attachment E

PRELIMINARY PROJECT COST ESTIMATE

Project Name: Highland Avenue Infiltration Trench

Project Number: PBLBT003

Client: Langhorne Manor Borough

Date: 8/8/2022

No.	Description	Estimated Quantity	Units	Estimated Unit Price	Item Subtotal
1	Mobilization (Max. $10,000)	1	LS	$ 10,000.00	$ 10,000.00
2	Erosion and Sediment Controls	1	LS	$ 10,000.00	$ 10,000.00
3	Maintenance and Protection of Traffic	1	LS	$ 5,000.00	$ 5,000.00
4	Infiltration Testing	1	LS	$ 5,000.00	$ 5,000.00
5	Site Grading	1	LS	$ 7,500.00	$ 7,500.00
6	Infiltration Trench, including Excavation, Stone Bedding, Geotextile, Perforated 8" HDPE, Backfilling, and Restorations	900	CY	$ 225.00	$ 202,500.00
7	8" HDPE Storm Pipe	50	LF	$ 100.00	$ 5,000.00
8	Asphalt Driveway Restoration	50	SY	$ 100.00	$ 5,000.00
9	4" Topsoil, Seed, and Straw	445	SY	$ 10.00	$ 4,450.00
10	12" Nyloplast Cleanout Drains, Including Bicycle Safe Grate	4	EA	$ 1,700.00	$ 6,800.00
11	Record Documents	1	LS	$ 3,000.00	$ 3,000.00
			Construction Cost Estimate Subtotal:		$ 264,250.00
			20% Contingency:		$ 52,850.00
			Construction Cost Estimate Total:		$ 317,100.00
			15% Engineering & Inspection:		$ 47,565.00
			Project Cost Estimate Total:		**$ 364,665.00**

Note: (1) This preliminary estimate does not include the costs of permitting, financing or utility provider charges.

PRELIMINARY PROJECT COST ESTIMATE

Project Name: W. Prospect Avenue Infiltration Trench

Project Number: PBLBT003

Client: Langhorne Manor Borough

Date: 8/8/2022

No.	Description	Estimated Quantity	Units	Estimated Unit Price	Item Subtotal
1	Mobilization (Max. $10,000)	1	LS	$ 10,000.00	$ 10,000.00
2	Erosion and Sediment Controls	1	LS	$ 10,000.00	$ 10,000.00
3	Maintenance and Protection of Traffic	1	LS	$ 5,000.00	$ 5,000.00
4	Infiltration Testing	1	LS	$ 5,000.00	$ 5,000.00
5	Site Grading	1	LS	$ 7,500.00	$ 7,500.00
6	Infiltration Trench, including Excavation, Stone Bedding, Geotextile, Perforated 8" HDPE, Backfilling, and Restorations	1,000	CY	$ 225.00	$ 225,000.00
7	8" HDPE Storm Pipe	75	LF	$ 100.00	$ 7,500.00
8	12" RCP Storm Pipe	25	LF	$ 125.00	$ 3,125.00
9	Asphalt Driveway Restoration	50	SY	$ 100.00	$ 5,000.00
10	Permanent Pavement Restoration	18	SY	$ 140.00	$ 2,520.00
11	4" Topsoil, Seed, and Straw	855	SY	$ 10.00	$ 8,550.00
12	12" Nyloplast Cleanout Drains, Including Bicycle Safe Grate	4	EA	$ 1,700.00	$ 6,800.00
13	Record Documents	1	LS	$ 3,000.00	$ 3,000.00
			Construction Cost Estimate Subtotal:		$ 298,995.00
			20% Contingency:		$ 59,799.00
			Construction Cost Estimate Total:		$ 358,794.00
			15% Engineering & Inspection:		$ 53,819.10
			Project Cost Estimate Total:		**$ 412,613.10**

Note: (1) This preliminary estimate does not include the costs of permitting, financing or utility provider charges.

PRELIMINARY PROJECT COST ESTIMATE

Project Name: Hill Avenue Infiltration Trench

Project Number: PBLBT003

Client: Langhorne Manor Borough

Date: 8/8/2022

No.	Description	Estimated Quantity	Units	Estimated Unit Price	Item Subtotal
1	Mobilization (Max. $10,000)	1	LS	$ 10,000.00	$ 10,000.00
2	Erosion and Sediment Controls	1	LS	$ 5,000.00	$ 5,000.00
3	Maintenance and Protection of Traffic	1	LS	$ 5,000.00	$ 5,000.00
4	Infiltration Testing	1	LS	$ 5,000.00	$ 5,000.00
5	Site Grading	1	LS	$ 7,500.00	$ 7,500.00
6	Infiltration Trench, including Excavation, Stone Bedding, Geotextile, Perforated 8" HDPE, Backfilling, and Restorations	800	CY	$ 225.00	$ 180,000.00
7	8" HDPE Storm Pipe	25	LF	$ 100.00	$ 2,500.00
8	Asphalt Driveway Restoration	18	SY	$ 100.00	$ 1,800.00
9	4" Topsoil, Seed, and Straw	360	SY	$ 10.00	$ 3,600.00
10	12" Nyloplast Cleanout Drains, Including Bicycle Safe Grate	2	EA	$ 1,700.00	$ 3,400.00
11	Record Documents	1	LS	$ 3,000.00	$ 3,000.00
			Construction Cost Estimate Subtotal:		$ 226,800.00
			20% Contingency:		$ 45,360.00
			Construction Cost Estimate Total:		$ 272,160.00
			15% Engineering & Inspection:		$ 40,824.00
			Project Cost Estimate Total:		**$ 312,984.00**

Note: (1) This preliminary estimate does not include the costs of permitting, financing or utility provider charges.

PRELIMINARY PROJECT COST ESTIMATE

Project Name: Pine Avenue and Park Avenue Infiltration Trenches (converging at the corner of Park Avenue and Pine Avenue)

Project Number: PBLBT003

Client: Langhorne Manor Borough

Date: 8/8/2022

No.	Description	Estimated Quantity	Units	Estimated Unit Price	Item Subtotal
1	Mobilization (Max. $10,000)	1	LS	$ 10,000.00	$ 10,000.00
2	Erosion and Sediment Controls	1	LS	$ 10,000.00	$ 10,000.00
3	Maintenance and Protection of Traffic	1	LS	$ 5,000.00	$ 5,000.00
4	Infiltration Testing	1	LS	$ 5,000.00	$ 5,000.00
5	Site Grading	1	LS	$ 7,500.00	$ 7,500.00
6	Infiltration Trench, including Excavation, Stone Bedding, Geotextile, Perforated 8" HDPE, Backfilling, and Restorations	1,200	CY	$ 225.00	$ 270,000.00
7	8" HDPE Storm Pipe	75	LF	$ 100.00	$ 7,500.00
8	Asphalt Driveway Restoration	100	SY	$ 40.00	$ 4,000.00
9	4" Topsoil, Seed, and Straw	735	SY	$ 10.00	$ 7,350.00
10	12" Nyloplast Cleanout Drains, Including Bicycle Safe Grate	4	EA	$ 1,700.00	$ 6,800.00
11	Record Documents	1	LS	$ 3,000.00	$ 3,000.00
			Construction Cost Estimate Subtotal:		$ 336,150.00
			20% Contingency:		$ 67,230.00
			Construction Cost Estimate Total:		$ 403,380.00
			15% Engineering & Inspection:		$ 60,507.00
			Project Cost Estimate Total:		**$ 463,887.00**

Note: (1) This preliminary estimate does not include the costs of permitting, financing or utility provider charges.

PRELIMINARY PROJECT COST ESTIMATE

Project Name: Pine Avenue Infiltration Trench (between 805 Pine Avenue and Manor Avenue)

Project Number: PBLBT003

Client: Langhorne Manor Borough

Date: 8/8/2022

No.	Description	Estimated Quantity	Units	Estimated Unit Price	Item Subtotal
1	Mobilization (Max. $10,000)	1	LS	$ 10,000.00	$ 10,000.00
2	Erosion and Sediment Controls	1	LS	$ 10,000.00	$ 10,000.00
3	Maintenance and Protection of Traffic	1	LS	$ 5,000.00	$ 5,000.00
4	Infiltration Testing	1	LS	$ 5,000.00	$ 5,000.00
5	Site Grading	1	LS	$ 7,500.00	$ 7,500.00
6	Infiltration Trench, including Excavation, Stone Bedding, Geotextile, Perforated 8" HDPE, Backfilling, and Restorations	1,300	CY	$ 225.00	$ 292,500.00
7	4" Topsoil, Seed, and Straw	660	SY	$ 10.00	$ 6,600.00
8	12" Nyloplast Cleanout Drains, Including Bicycle Safe Grate	4	EA	$ 1,700.00	$ 6,800.00
9	Record Documents	1	LS	$ 3,000.00	$ 3,000.00

Construction Cost Estimate Subtotal:	$ 346,400.00
20% Contingency:	$ 69,280.00
Construction Cost Estimate Total:	$ 415,680.00
15% Engineering & Inspection:	$ 62,352.00
Project Cost Estimate Total:	**$ 478,032.00**

Note: (1) This preliminary estimate does not include the costs of permitting, financing or utility provider charges.

REMINGTON & VERNICK ENGINEERS

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MEMORANDUM

To: Langhorne Manor Borough Council Members

Subject: **Infiltration Trench Project Executive Summary**

Date: September 7, 2022

Prepared by: Isaac E. Kessler, P.E., Township Engineer

Langhorne Manor Borough is authorized to discharge stormwater to the Neshaminy Creek and Mill Creek, the two waterways within the Borough, through an Individual MS4 Permit. Part of this MS4 permit consists of the annual MS4 Program which is meeting PADEP MS4 requirements through different control measures of preventing pollution to these waterways. Some of these control measures consist of distribution of educational materials, stormwater mapping, presentations on stormwater, and updating projects to meet pollutant reduction goals.

Even though there are smaller MS4 goals that take place annually, every PADEP recognized polluted waterway has specific requirements on how sediment reduction should take place. Neshaminy Creek and Mill Creek are both siltation impaired, additionally Neshaminy Creek is a Total Maximum Daily Load (TMDL) Waterway. These specific classifications require a Pollution Reduction Plan (PRP) or TMDL Plan. These larger plans calculate the amount of sediment that is being discharged from the Borough and plan for different projects within the correlating watershed to remove the sediment. PADEP has outlined specific types of Best Management Practices (BMPs) and percentages for reductions for each proposed project to address. Langhorne Manor Borough previously had their TMDL plan approved by PADEP in 2019.

The current deadline for the Borough is to reach the 10% reduction for both the watersheds by 2024. The overall TMDL BMP update for the Borough approved plan has been drafted, and we have worked closely with the Stormwater Commission to identify a viable path forward to reach the sediment reduction goals.

The Borough has approved the full design of the Comly Avenue MS4 Stormwater Project. This was the initial step to completing the 10% reduction in the Neshaminy Creek Watershed. This project is a proposed stormwater basin within Borough property along Comly Avenue near Hulmeville Avenue. The project has a proposed sediment reduction of 6,800 lbs/year. Phase 1 of the project was completed in tandem of the intersection work for the Hulmeville Avenue Bridge Replacement project. Phase 1 consisted of the installation of basin outlet structures, stormwater piping, a manhole, and stone riprap. The anticipated completion of the full Comly Avenue Basin is in the summer of 2023. With the completion of this project there is a 3,578 lbs/year reduction remaining in the Neshaminy Creek Watershed.

RVE prepared a TMDL BMP Option Memorandum discussed with the Stormwater Commission at their August 22nd meeting. This Memorandum presented different project options to complete the reduction difference in the Neshaminy Creek Watershed and the overall reduction in the Mill Creek Watershed.

The proposed projects consist of:

- Highland Avenue Infiltration Trench – 10,134 lbs/year
- Prospect Avenue Infiltration Trench – 6,774.09 lbs/year
- Hill Avenue Infiltration Trench – 2,681.97 lbs/year
- Pine Avenue and Park Avenue Swales – 4,750.17 lbs/year
- Pine Avenue Swale, between 805 Pine Avenue and Manor Avenue – 9,096.81 lbs/year

The goal of the proposed projects is to maximize MS4 reduction credits within the Borough Right of Way and minimize the impact to residential properties and existing structures (trees, mailboxes, masonry light posts, etc.). Infiltration trenches are a lower maintenance BMP that can reduce sediment with infiltration of stormwater into the ground. Water moves through various drains and porous pipe infiltrating into the ground or discharging to the natural waterways.

The Prospect Avenue Swale and Pine Avenue Swale between 805 Pine Avenue and Manor Avenue are the two potential stormwater projects recommended by the Stormwater Commission. This is because of their ability to meet reduction requirements and minimize disturbance to residential properties and existing structures. RVE has begun to research grant opportunities for potential funding assistance to complete these MS4 related projects and allow them to be planned with the Borough's annual budget.

Recommended Motions:

If council concurs, the recommended motion would be:

1st Motion
"I make a motion to approve the recommended projects on Prospect Avenue and Pine Avenue to meet the Borough's MS4 permit requirements, and to update the Borough's TMDL plan to identify these projects to meet pollutant reduction goals."

2nd Motion
"I make a motion to approve RVE to identify and prepare grant applications for funding assistance with the stormwater infiltration trench projects on Prospect Avenue and Pine Avenue."

Thank you.