

AGENDA

North Fork Rivanna River Cleanup Plan 2nd Community Engagement Meeting September 24th, 2024 at 1:00 p.m.

Meeting purpose: Engage the public to provide feedback/recommendations on the development of a Cleanup Plan for the North Fork Rivanna River Watershed in Albemarle, Greene, and Orange Counties.

- Introductions
- Overview of Cleanup Plan development process
- Review of the TMDLs
 - 2008 Bacteria TMDL
 - 2018 Benthic TMDL
 - Phosphorus and sediment impairments
- **Residential Septic**
 - Overview:
 - Within the North Fork Rivanna River watershed, estimated totals (TMDL, 2019)

Watershed	Total Septic Systems	Houses with Failing Septic Systems	Houses with Straight Pipes
Blue Run	409	14	0
Marsh Run	452	15	0
Preddy Creek	699	24	0
Preddy Creek North Branch	1775	60	0
Quarter Creek	905	31	0
NF Rivanna	2,341	80	0
Swift Run	700	23	0
<u>Stanardsville Run</u>	118	4	0
X Trib to Flat Branch	20	1	0

- Proposed BMPs:
 - Around 50/50 on Replacements vs. Repairs
 - ? Should there be any alternative systems implemented, if so how much (10%)?
 - ? How many septic pumpouts should we call for in each watershed, 1/3 of the households?

Sub-watershed	Practice	Cost-share code	Unit	Unit Cost	Stage 1	Stage 2	Stage 3	Stage 4	Cost
Blue Run	Septic Tank Pumpout	RB-1	Pump-out	\$375	2	0	0	0	\$750
	Septic Tank Repair	RB-3	Repair	\$5,000	4	3	0	0	\$35,000
	Septic System Replacement	RB-4	Systems	\$8,000	4	3	0	0	\$56,000
Marsh Run	Septic Tank Pumpout	RB-1	Pump-out	\$375	2	0	0	0	\$750
	Septic Tank Repair	RB-3	Repair	\$5,000	4	4	0	0	\$40,000
	Septic System Replacement	RB-4	Systems	\$8,000	3	4	0	0	\$56,000
Preddy Creek	Septic Tank Pumpout	RB-1	Pump-out	\$375	7	8	0	0	\$5,625
	Septic Tank Repair	RB-3	Repair	\$5,000	6	6	0	0	\$60,000
	Septic System Replacement	RB-4	Systems	\$8,000	6	6	0	0	\$96,000
Preddy Creek North Branch	Septic Tank Pumpout	RB-1	Pump-out	\$375	7	8	0	0	\$5,625
	Septic Tank Repair	RB-3	Repair	\$5,000	15	15	0	0	\$150,000
	Septic System Replacement	RB-4	Systems	\$8,000	15	15	0	0	\$240,000
								Total Cost	\$745,750

Sub-watershed	Practice	Cost-share code	Unit	Unit Cost	Stage 1	Stage 2	Stage 3	Stage 4	Cost
Quarter Creek	Septic Tank Pumpout	RB-1	Pump-out	\$375	25	26	17	17	\$31,875
	Septic Tank Repair	RB-3	Repair	\$5,000	8	8	0	0	\$80,000
	Septic System Replacement	RB-4	Systems	\$8,000	8	7	0	0	\$120,000
North Fork Rivanna	Septic Tank Pumpout	RB-1	Pump-out	\$375	18	19	29	29	\$35,625
	Septic Tank Repair	RB-3	Repair	\$5,000	20	20	0	0	\$200,000
	Septic System Replacement	RB-4	Systems	\$8,000	20	20	0	0	\$320,000
Swift Run	Septic Tank Pumpout	RB-1	Pump-out	\$375	25	25	0	0	\$18,750
	Septic Tank Repair	RB-3	Repair	\$5,000	6	6	0	0	\$60,000
	Septic System Replacement	RB-4	Systems	\$8,000	5	6	0	0	\$88,000
Stanardsville Run	Septic Tank Pumpout	RB-1	Pump-out	\$375	6	0	0	0	\$2,250
	Septic Tank Repair	RB-3	Repair	\$5,000	2	0	0	0	\$10,000
	Septic System Replacement	RB-4	Systems	\$8,000	2	0	0	0	\$16,000
X Trib to Flat Branch	Septic Tank Pumpout	RB-1	Pump-out	\$375	2	0	0	0	\$750
	Septic Tank Repair	RB-3	Repair	\$5,000	1	0	0	0	\$5,000
								Total Cost	\$988,250

- Overall Summary of BMPs Needed:

Practice	Cost-share code	Unit	Unit Cost	Total	Cost
Septic Tank Pumpout	RB-1	Pump-out	\$375	272	\$102,000
Septic Tank Repair	RB-3	Repair	\$5,000	128	\$640,000
Septic System Replacement	RB-4	Systems	\$8,000	124	\$992,000
				Total Cost	\$1,734,000

- **Pet Waste**

- Proposed BMPs:

- Pet Waste Management Plan is applied throughout each stage.

- ? Should there be more disposal stations and composters? Or should there be less?

Sub-watershed	Practice	Unit	Unit Cost	Stage 1	Stage 2	Stage 3	Stage 4	Cost
Blue Run	Pet Waste Disposal Station	System	\$2,000	2	0	0	0	\$4,000
	Pet Waste Composter	System	\$400	3	0	0	0	\$1,200
Marsh Run	Pet Waste Disposal Station	System	\$2,000	3	0	0	0	\$6,000
	Pet Waste Composter	System	\$400	3	0	0	0	\$1,200
Preddy Creek	Pet Waste Management Plan	Program	\$4,000		1			\$16,000
	Pet Waste Disposal Station	System	\$2,000	2	0	0	0	\$4,000
	Pet Waste Composter	System	\$400	4	0	0	0	\$1,600
Preddy Creek North Branch	Pet Waste Disposal Station	System	\$2,000	4	4	0	0	\$16,000
	Pet Waste Composter	System	\$400	5	5	0	0	\$4,000
Total Cost								\$54,000

Sub-watershed	Practice	Unit	Unit Cost	Stage 1	Stage 2	Stage 3	Stage 4	Cost
Quarter Creek	Pet Waste Disposal Station	System	\$2,000	2	0	0	0	\$4,000
	Pet Waste Composter	System	\$400	4	0	0	0	\$1,600
North Fork Rivanna	Pet Waste Management Plan	Program	\$4,000		1			\$16,000
	Pet Waste Disposal Station	System	\$2,000	5	5	0	0	\$20,000
	Pet Waste Composter	System	\$400	6	6	0	0	\$4,800
Swift Run	Pet Waste Disposal Station	System	\$2,000	4	0	0	0	\$8,000
	Pet Waste Composter	System	\$400	7	0	0	0	\$2,800
Stanardsville Run	Pet Waste Disposal Station	System	\$2,000	1	0	0	0	\$2,000
	Pet Waste Composter	System	\$400	2	0	0	0	\$800
X Trib to Flat Branch	Pet Waste Disposal Station	System	\$2,000	1	0	0	0	\$2,000
	Pet Waste Composter	System	\$400	2	0	0	0	\$800
Total Cost								\$62,800

- Overall Summary of BMPs Needed

Practice	Unit	Unit Cost	Total	Cost
Pet Waste Disposal Station	System	\$2,000	33	\$66,000
Pet Waste Composter		\$400	47	\$18,800
Pet Waste Management Plan	Program	\$4,000	2	\$32,000
			Total Cost	\$116,800

- **Agricultural**

- Proposed BMPs:

- Exclusion practices were distributed evenly over Stages 1 and 2, or 60% were in Stages 1 and 2, and 40% were in Stages 3 and 4.
 - Fencing needs include what has been done since the TMDL was completed in 2018.
 - ? What percentage of the fencing should be SL-6N? 5%? 10%?

Sub-watershed	Approximate fencing installed to date (feet)	Fencing Still Needed				Sub-watershed	SL-6W or CRSL-6	
		Stage 1	Stage 2	Stage 3	Stage 4		feet	systems
Blue Run	0	2939	2938	0	0	Blue Run	5877	2.7
Marsh Run	6201	1044	1043	0	0	Marsh Run	2087	0.95
Preddy Creek	11117	8198	8197	0	0	Preddy Creek	16395	7.4
Preddy Creek North Branch	0	2017	2016	0	0	Preddy Creek North Branch	4033	1.8
Quarter Creek	0	1302	1302	0	0	Quarter Creek	2604	1.2
North Fork Rivanna	6057	22967	22967	15312	15312	North Fork Rivanna	76558	34.8
Swift Run	40214	4749	4749	0	0	Swift Run	9498	4.3
Stanardsville Run	0	760	0	0	0	Stanardsville Run	760	0.35
X Trib to Flat Branch	0	0	0	0	0			

- **Blue Run**

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Livestock Exclusion	Stream Exclusion With Grazing Land Management	SL-6W, CRSL-6	System	\$34,000	1.4	1.3	0	0	2.7	\$91,800
Cropland	Long Term Vegetative Cover on Cropland	SL-1	Acres	\$150	2	3	0	0	5	\$750
	Cover Crop	SL-8B/8H		\$80	3	4	0	0	7	\$560
Pasture	Sediment Retention , Erosion, or Water Control Structures	WP-1	System	\$150	2	3	0	0	5	\$750
	Afforestation of erodible pasture	FR-1	Acres Treated	\$500	9	9	12	12	42	\$21,000
	Permanent vegetative cover on critical areas	SL-11		\$1,800	40	40	60	60	200	\$360,000
	Improved pasture management	SL-10		\$75	120	120	80	80	400	\$30,000
	Extensions of Watering System	SL-7		\$20,000	6	6	8	8	28	\$560,000
	Sediment Retention , Erosion, or Water Control Structures	WP-1		\$150	75	75	112.5	112.5	375	\$56,250
	Animal waste control facilities	WP-4		\$300,000	1	0	0	0	1	\$300,000
Roof Runoff Management	WQ-12	\$1,450		1	0	0	0	1	\$1,450	
Stream Bank	Stream Restoration	N/A	Feet	\$1,000	125	0	0	0	125	\$125,000
Total Cost									\$1,547,560	

- Marsh Run

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Livestock Exclusion	Stream Exclusion With Grazing Land Management	SL-6W, CRSL-6	Systems	\$34,000	0.47	0.47	0	0	0.94	\$31,960
Pasture	Afforestation of erodible pasture	FR-1	Acres Treated	\$500	6	6	8	8	28	\$14,000
	Permanent vegetative cover on critical areas	SL-11		\$1,800	13	14	20	20	67	\$120,600
	Improved pasture management	SL-10		\$75	135	135	90	90	450	\$33,750
	Extension of Watering System	SL-7		\$20,000	10	11	7	7	35	\$700,000
	Sediment Retention , Erosion, or Water Control Structures	WP-1		\$150	80	80	120	120	400	\$60,000
	Animal waste control facilities	WP-4		Systems	\$300,000	1	0	0	0	1
	Roof Runoff Management	WQ-12		\$1,450	1	0	0	0	1	\$1,450
Stream Bank	Stream Restoration	N/A	Feet	\$1,000	70	0	0	0	70	\$70,000
									Total Cost	\$1,331,760

- Preddy Creek

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Livestock Exclusion	Stream Exclusion With Grazing Land Management	SL-6W, CRSL-6	Systems	\$34,000	3.7	3.7	0	0	7.4	\$251,600
Cropland	Long Term Vegetative Cover on Cropland Cover Crop	SL-1	Acres Treated	\$150	4	4	5	5	18	\$2,700
		SL-8B/8H		\$80	5	5	7.5	7.5	25	\$2,000
	Sediment Retention, Erosion, or Water Control Structures	WP-1		\$150	6.5	6.5	10	10	33	\$4,950
Pasture	Afforestation of erodible cropland	FR-1	Acres Treated	\$500	5.2	0	0	0	5.2	\$2,600
	Afforestation of erodible pasture	FR-1		\$500	115	115	172.5	172.5	575	\$287,500
	Permanent vegetative cover on critical areas	SL-11		\$1,800	83	83	124	124	414	\$745,200
	Improved pasture management	SL-10		\$75	810	810	540	540	2700	\$202,500
	Extension of Watering System	SL-7		\$20,000	5	5	0	0	10	\$200,000
	Sediment Retention , Erosion, or Water Control Structures	WP-1		\$150	346	346	519	519	1730	\$259,500
	Animal waste control facilities	WP-4	Systems	\$300,000	1	0	0	0	1	\$300,000
Roof Runoff Management	WQ-12		\$1,450	1	0	0	0	1	\$1,450	
Harvested	Afforestation of Crop, Hay, and Pasture	FR-1	Acres	\$500	3.6	3.6	5.3	5.3	17.8	\$8,900
Barren	Farm Road or Heavy Animal Travel Lane Stabilization	SL-11B	Acres	?	0.01	0	0	0	0.01	?
Stream Bank	Stream Restoration	N/A	Feet	\$1,000	424	424	283	283	1414	\$1,414,000
									Total Cost	\$3,682,900

- **Preddy Creek North Branch**

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Livestock Exclusion	Stream Exclusion With Grazing Land Management	SL-6W, CRSL-6	System	\$34,000	0.91	0.91	0	0	1.82	\$61,880
Cropland	Long Term Vegetative Cover on Cropland	SL-1	Acres Treated	\$150	2	2	0	0	4	\$600
	Cover Crop	SL-8B/8H		\$80	2	2	0	0	4	\$320
	Sediment Retention, Erosion, or Water Control Structures	WP-1		\$150	3.5	0	0	0	3.5	\$525
Pasture	Afforestation of erodible pasture	FR-1	Acres Treated	\$500	59	59.5	89	89	296.5	\$148,250
	Permanent vegetative cover on critical areas	SL-11		\$1,800	21	21	32	32	106	\$190,800
	Improved pasture management	SL-10		\$75	135	135	90	90	450	\$33,750
	Extension of Watering System	SL-7		\$20,000	5	0	0	0	5	\$100,000
	Sediment Retention, Erosion, or Water Control Structures	WP-1		\$150	70	70	105	105	350	\$52,500
	Animal waste control facilities	WP-4		\$300,000	1	0	0	0	1	\$300,000
	Roof Runoff Management	WQ-12		\$1,450	1	0	0	0	1	\$1,450
Harvested	Afforestation of Crop, Hay, and Pasture	FR-1	Acres	\$500	31	31	46	46	154	\$77,000
Barren	Farm Road or Heavy Animal Travel Lane Stabilization	SL-11B	Acres	?	0.31	0	0	0	0.31	?
Stream Bank	Stream Restoration	N/A	Feet	\$1,000	391	392	261	261	1305	\$1,305,000
									Total Cost	\$2,272,075

- **Quarter Creek**

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Livestock Exclusion	Stream Exclusion With Grazing Land Management	SL-6W, CRSL-6	Systems	\$34,000	0.6	0.6	0	0	1.2	\$40,800
Pasture	Afforestation of erodible pasture	FR-1	Acres Treated	\$500	7	8	12	12	39	\$19,500
	Permanent vegetative cover on critical areas	SL-11		\$1,800	16	16	24	24	80	\$144,000
	Improved pasture management	SL-10		\$75	78	78	52	52	260	\$19,500
	Extension of Watering System	SL-7		\$20,000	6	6	0	0	12	\$240,000
	Sediment Retention, Erosion, or Water Control Structures	WP-1		\$150	50	50	75	75	250	\$37,500
	Animal waste control facilities	WP-4		\$300,000	1	0	0	0	1	\$300,000
	Roof Runoff Management	WQ-12		\$1,450	1	0	0	0	1	\$1,450
Harvested	Afforestation of erodible pasture	FR-1	Acres	\$500	3.5	0	0	0	3.5	\$1,750
Stream Bank	Stream Restoration	N/A	Feet	\$1,000	285	0	0	0	285	\$285,000
									Total Cost	\$1,089,500

- NF Rivanna

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost	
					Stage 1	Stage 2	Stage 3	Stage 4	Total		
Livestock Exclusion	Stream Exclusion With Grazing Land Management	SL-6W, CRSL-6	Systems	\$34,000	10.4	10.4	7	7	34.8	\$1,183,200	
Cropland	Long Term Vegetative Cover on Cropland	SL-1	Acres Treated	\$150	5	5	7.5	7.5	25	\$3,750	
	Cover Crop	SL-8B/8H		\$80	20	20	30	30	100	\$8,000	
	Sediment Retention, Erosion, or Water Control Structures	WP-1		\$150	20	20	30	30	100	\$15,000	
	Afforestation of erodible pasture	FR-1		\$500	3	3	4.5	4.5	15	\$7,500	
Pasture	Afforestation of erodible pasture	FR-1	Acres Treated	\$500	140	140	210	210	700	\$350,000	
	Permanent vegetative cover on critical areas	SL-11		\$1,800	160	160	240	240	800	\$1,440,000	
	Improved pasture management	SL-10		\$75	1485	1485	990	990	4950	\$371,250	
	Extension of Watering System	SL-7		\$20,000	13.5	13.5	9	9	45	\$900,000	
	Sediment Retention , Erosion, or Water Control Structures	WP-1		\$150	730.5	730.5	1097	1097	3655	\$548,250	
	Animal waste control facilities	WP-4		Systems	\$300,000	4	0	0	0	4	\$1,200,000
	Roof Runoff Management	WQ-12			\$1,450	3	0	0	0	3	\$4,350
Total Cost									\$6,031,300		

- Swift Run

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Livestock Exclusion	Stream Exclusion With Grazing Land Management	SL-6W, CRSL-6	Systems	\$34,000	2.15	2.15	0	0	4.3	\$146,200
Cropland	Long Term Vegetative Cover on Cropland	SL-1	Acres Treated	\$150	7.5	7.5	0	0	15	\$2,250
	Cover Crop	SL-8B/8H		\$80	14.5	14.5	21	21	71	\$5,680
	Sediment Retention , Erosion, or Water Control Structures	WP-1		\$150	12.5	12.5	20	20	65	\$9,750
Pasture	Afforestation of erodible pasture	FR-1	Acres Treated	\$500	67	67	100.5	100.5	335	\$167,500
	Permanent vegetative cover on critical areas	SL-11		\$1,800	78	78	117	117	390	\$702,000
	Improved pasture management	SL-10		\$75	450	450	300	300	1500	\$112,500
	Extension of Watering System	SL-7		\$20,000	6	6	0	0	12	\$240,000
	Sediment Retention , Erosion, or Water Control Structures	WP-1		\$150	220	220	330	330	1100	\$165,000
	Animal waste control facilities	WP-4		Systems	\$300,000	1	0	0	0	1
Roof Runoff Management	WQ-12	\$1,450	1		0	0	0	1	\$1,450	
Harvested	Afforestation of erodible pasture	FR-1	Acres	\$500	1.94	0	0	0	1.94	\$970
Stream Bank	Stream Restoration	N/A	Feet	\$1,000	701	701	468	468	2338	\$2,338,000
Total Cost									\$4,191,300	

- **Standardsville Run**

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Livestock Exclusion	Stream Exclusion With Grazing Land Management	SL-6W, CRSL-6	Systems	\$34,000	0.35	0	0	0	0.35	\$11,900
Cropland	Long Term Vegetative Cover on Cropland	SL-1	Acres	\$150	0.2	0.1	0	0	0.3	\$45
	Cover Crop	SL-8B/8H		\$80	0.1	0	0	0	0.1	\$8
Pasture	Afforestation of erodible pasture	FR-1	Acres Treated	\$500	5	5	7.5	7.5	25	\$12,500
	Permanent vegetative cover on critical areas	SL-11		\$1,800	8.5	8.5	13	13	43	\$77,400
	Improved pasture management	SL-10		\$75	33	33	22	22	110	\$8,250
	Extension of Watering System	SL-7		\$20,000	7	7	4.5	4.5	23	\$460,000
	Sediment Retention , Erosion, or Water Control Structures	WP-1		\$150	26	26	39	39	130	\$19,500
	Animal waste control facilities	WP-4		\$300,000	1	0	0	0	1	\$300,000
Stream Bank	Roof Runoff Management	WQ-12	Systems	\$1,450	1	0	0	0	1	\$1,450
	Stream Restoration	N/A	Feet	\$1,000	49	0	0	0	49	\$49,000
									Total Cost	\$940,053

- **X Trib to Flat Branch**

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Pasture	Afforestation of erodible pasture	FR-1	Acres Treated	\$500	0.2	0.2	0	0	0.4	\$200
	Permanent vegetative cover on critical areas	SL-11		\$1,800	0.65	0	0	0	0.65	\$1,170
	Improved pasture management	SL-10		\$75	1.7	0	0	0	1.7	\$128
	Extension of watering system	SL-7		\$20,000	0.7	0	0	0	0.7	\$14,000
	Animal waste control facilities	WP-4		\$300,000	1	0	0	0	1	\$300,000
	Roof Runoff Management	WQ-12		\$1,450	1	0	0	0	1	\$1,450
Barren	Farm Road or Heavy Animal Travel Lane Stabilization	SL-11B	Acres	?	0.01	0	0	0	0.01	?
Stream Bank	Stream Restoration	N/A	Feet	\$1,000	21	0	0	0	21	\$21,000
									Total Cost	\$337,948

▪ Overall Summary of BMPs Needed:

BMP Type	Description	BMP Code	Units	Unit Cost	Total	Cost
Livestock Exclusion	Stream Exclusion With Grazing Land Management	SL-6W, CRSL-6	Systems	\$34,000	53.51	\$1,819,340
Cropland	Long Term Vegetative Cover on Cropland	SL-1	Acres Treated	\$150	67.3	\$10,095
	Cover Crop	SL-8B/8H		\$80	207.1	\$16,568
	Sediment Retention , Erosion, or Water Control Structures	WP-1		\$150	206.5	\$30,975
	Afforestation of erodible cropland	FR-1		\$500	20.2	\$10,100
Pasture	Afforestation of erodible pasture	FR-1	Acres Treated	\$500	2040.9	\$1,020,450
	Permanent vegetative cover on critical areas	SL-11		\$1,800	2100.65	\$3,781,170
	Improved pasture management	SL-10		\$75	10821.7	\$811,628
	Extension of Watering System	SL-7		\$20,000	170.7	\$3,414,000
	Sediment Retention , Erosion, or Water Control Structures	WP-1		\$150	7990	\$1,198,500
	Animal waste control facilities	WP-4		\$300,000	12	\$3,600,000
Harvested	Roof Runoff Management	WQ-12	Systems	\$1,450	11	\$15,950
	Afforestation of Crop, Hay, and Pasture Land	FR-1		Acres	\$500	177.24
Stream Bank	Stream Restoration	N/A	Feet	\$1,000	5607	\$5,607,000
					Total Cost	\$21,424,396

- Urban

- Proposed BMPs:

- Blue Run

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Urban	Bioretention	N/A	Acres Treated	\$10,000	14	14	21	21	70	\$700,000
	Permeable Pavement	N/A		\$240,000	4	4	7	7	22	\$5,280,000
	Grass Channels	N/A		\$18,150	3.9	3.9	2.6	2.6	13	\$235,950
	Conservation Landscaping	N/A	Acres	\$3,500	18	18	26	26	88	\$308,000
	Rainwater Harvesting	N/A	Acres Treated	\$100,000	2.8	2.9	4.2	4.2	14.1	\$1,410,000
Total Cost									\$7,933,950	

- Marsh Run

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Urban	Bioretention	N/A	Acres Treated	\$10,000	5	5	7	7	24	\$240,000
	Permeable Pavement	N/A		\$240,000	2	2	3	3	10	\$2,400,000
	Grass Channels	N/A		\$18,150	5.5	0	0	0	5.5	\$99,825
	Conservation Landscaping	N/A	Acres	\$3,500	28	29	44	44	145	\$507,500
	Rainwater Harvesting	N/A	Acres Treated	\$100,000	3	0	0	0	3	\$300,000
Total Cost									\$3,547,325	

- Preddy Creek

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Urban	Bioretention	N/A	Acres Treated	\$10,000	39.8	39.8	59.7	59.7	199	\$1,990,000
	Permeable Pavement	N/A		\$240,000	2	2	0	0	4	\$960,000
	Grass Channels	N/A		\$18,150	5	5	0	0	10	\$181,500
	Bioswale	N/A	\$42,000	5	5	0	0	10	\$420,000	
	Conservation Landscaping	N/A	Acres	\$3,500	130	130	195	195	650	\$2,275,000
	Rainwater Harvesting	N/A	Acres Treated	\$100,000	1	1	0	0	2	\$200,000
Total Cost									\$6,026,500	

- **Preddy Creek North Branch**

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Urban	Bioretention	N/A	Acres Treated	\$10,000	70	70	165	165	470	\$4,700,000
	Permeable Pavement	N/A		\$240,000	7	7	11	11	36	\$8,640,000
	Grass Channels	N/A		\$18,150	3.5	3.5	2	2	11	\$199,650
	Bioswale	N/A	Acres	\$42,000	5	5	0	0	10	\$420,000
	Conservation Landscaping	N/A		\$3,500	150	150	225	225	750	\$2,625,000
	Rainwater Harvesting	N/A		\$100,000	4.5	4.5	6	6	21	\$2,100,000
Total Cost									\$18,684,650	

- **Quarter Creek**

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Urban	Bioretention	N/A	Acres Treated	\$10,000	18	18	27	27	90	\$900,000
	Permeable Pavement	N/A		\$240,000	5	5	7	7	24	\$5,760,000
	Grass Channels	N/A	Acres	\$18,150	6.2	6.2	4	4	20.4	\$370,260
	Conservation Landscaping	N/A		\$3,500	40	40	60	60	200	\$700,000
	Rainwater Harvesting	N/A		\$100,000	8	8	10	10	36	\$3,600,000
Total Cost									\$11,330,260	

- **NF Rivanna**

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Urban	Bioretention	N/A	Acres Treated	\$10,000	48	48	71	71	238	\$2,380,000
	Grass Channels	N/A		\$18,150	6	6	4	4	20	\$363,000
	Conservation Landscaping	N/A	Acres	\$3,500	180	180	270	270	900	\$3,150,000
Total Cost									\$5,893,000	

- **Swift Run**

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Urban	Bioretention	N/A	Acres Treated	\$10,000	27	27	41	41	136	\$1,360,000
	Permeable Pavement	N/A		\$240,000	3.2	0	0	0	3.2	\$768,000
	Grass Channels	N/A	Acres	\$18,150	1.7	0	0	0	1.7	\$30,855
	Conservation Landscaping	N/A		\$3,500	70	70	105	105	350	\$1,225,000
	Rainwater Harvesting	N/A		\$100,000	1.5	0	0	0	1.5	\$150,000
Total Cost									\$3,533,855	

- **Standardsville Run**

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Urban	Bioretention	N/A	Acres Treated	\$10,000	14	14	22	22	72	\$720,000
	Permeable Pavement	N/A		\$240,000	3	3	4	4	14	\$3,360,000
	Grass Channels	N/A	\$18,150	6	6	4	4	20	\$363,000	
	Conservation Landscaping	N/A	Acres	\$3,500	28.5	28.5	44	44	145	\$507,500
	Rainwater Harvesting	N/A	Acres Treated	\$100,000	4	4	5	5	18	\$1,800,000
								Total Cost	\$6,750,500	

- **X Trib to Flat Branch**

BMP Type	Description	BMP Code	Units	Unit Cost	Extent					Cost
					Stage 1	Stage 2	Stage 3	Stage 4	Total	
Urban	Bioretention	N/A	Acres Treated	\$10,000	6	6	10	10	32	\$320,000
	Permeable Pavement	N/A		\$240,000	3	3	5	5	16	\$3,840,000
	Grass Channels	N/A	\$18,150	4	4	0	0	8	\$145,200	
	Conservation Landscaping	N/A	Acres	\$3,500	12	13	19	19	63	\$220,500
	Rainwater Harvesting	N/A	Acres Treated	\$100,000	4.4	0	0	0	4.4	\$440,000
								Total Cost	\$4,965,700	

▪ Overall Summary of BMP Needs:

BMP Type	Description	BMP Code	Units	Unit Cost	Total	Cost
Urban	Bioretention	N/A	Acres Treated	\$10,000	1331	\$13,310,000
	Permeable Pavement	N/A		\$240,000	129.2	\$31,008,000
	Grass Channels	N/A		\$18,150	109.6	\$1,989,240
	Bioswale	N/A	\$42,000	20	\$840,000	
	Conservation Landscaping	N/A	Acres	\$3,500	3291	\$11,518,500
	Rainwater Harvesting	N/A	Acres Treated	\$100,000	100	\$10,000,000
					Total Cost	\$68,665,740

- **Overall BMP Summary**

- Total BMP implementation costs by stage:

BMP Application	Cost by Stage				Total
	Stage 1 (Years 1-5)	Stage 2 (Years 6-10)	Stage 3 (Years 11-15)	Stage 4 (16-20)	
Agricultural	\$9,026,310	\$4,747,825	\$3,825,130	\$3,825,130	\$21,424,396
Residential	\$16,754,070	\$14,903,390	\$19,413,540	\$19,445,540	\$70,516,540
Total Estimated Cost	\$25,780,381	\$19,651,215	\$23,238,670	\$23,270,670	\$91,940,936

- **TA Assistance**

- One (1) full-time employee (FTE) for each SWCD (2 total) for Ag BMPs?
 - One (1) full-time employee (FTE) for each SWCD (2 total) for Residential Septic/Pet Waste BMPs?

- **Questions:**

- Contact: Madison Whitehurst, madison.whitehurst@deq.virginia.gov or 804-489-8796