

**Mine Run, Mountain Run, and Lower Rapidan River Bacteria Clean Up Plan
2nd Community Engagement Meeting – June 27th 1pm**

Section 1: Residential Septic and Pet Waste

Updated totals in *red*

Watershed	Houses on Public Sewer or General Permit	Total Septic Systems	Houses with Failing Septic Systems	Houses with Straight Pipes
Rapidan-Rapidan River	232	335	131	9
Cedar Run	50	425	129	6
Potato Run-Rapidan River	27	584	181	20
Mill Run-Mountain Run	0	474	169	6
Mine Run	1	612	196	6
Fields Run-Rapidan River	1,760	661	167	9
Wilderness Run	858	805	170	0

Previously Cedar Run estimates were 77 houses on sewer, 398 houses unsewered, 121 failing septic systems, and 6 straight pipes; Potato Run – Rapidan River estimates were 13 straight pipes

Are these estimates reasonable?

BMP (Cost-share codes in parentheses)	Units	Extent
Connection to public sewer (RB-2)	Connection	2
Connection to public sewer w/pump (RB-2P)	Connection	1
Onsite sewage system repair w/ permit (RB-3)	Repair	161
Full inspection and non-permitted onsite sewage system repair (RB-3M)	Repair	161
Onsite sewage system installation/replacement (RB-4)	System	209
Onsite sewage system installation/replacement w/ pump (RB-4P)	System	209
Alternative sewage system (RB-5)	System	448
Septic tank pump-out (RB-1)	Pump-out	1,277

Overall Costs to Implement Residential Septic BMPs:
 Are these estimates reasonable?

Practice	Units	Unit cost	Number of Units	Total
Septic tank pump-out (RB-1)	Pump-out	\$450	1,277	\$574,650
Connection to public sewer (RB-2)	Connection	\$12,500	2	\$25,000
Connection to public sewer w/pump (RB-2P)	Connection	\$20,500	1	\$20,500
Onsite sewage system repair w/ permit (RB-3)	Repair	\$7,500	161	\$1,207,500
Full inspection and non-permitted onsite sewage system repair (RB-3M)	Repair	\$4,875*	161	\$784,875
Onsite sewage system installation/replacement (RB-4)	System	\$12,500	209	\$2,612,500
Onsite sewage system installation/replacement w/ pump (RB-4P)	System	\$16,500	209	\$3,448,500
Alternative sewage system (RB-5)	System	\$31,500	448	\$14,112,000
Total Estimated Cost				\$22,785,525

Estimated cost/unit varies between \$3,250 - \$6,000 depending on lifespan

Staged Implementation Goals: What is a reasonable amount of time for each stage? 5 years? 10 years?

Any other suggestions?

Proposed # of Stages:

Description	Units	Stage 1 (33.3%)	Stage 2 (33.3%)	Stage 3 (33.3%)
Septic tank pump-out (RB-1)	Pump-out	426	426	425
Connection to public sewer (RB-2)	Connection	1	1	0
Connection to public sewer w/pump (RB-2P)	Connection	1	0	0
Onsite sewage system repair w/ permit (RB-3)	Repair	54	54	53
Full inspection and non-permitted onsite sewage system repair (RB-3M)	Repair	54	54	53
Onsite sewage system installation/replacement (RB-4)	System	70	70	69
Onsite sewage system installation/replacement w/ pump (RB-4P)	System	70	70	69
Alternative sewage system (RB-5)	System	150	149	149

Residential Septic Priority Areas:

- Suggesting to categorize priorities by low to highest. Highest being where there will be a greater need for alternative systems or system replacement because of soil that doesn't percolate and lowest being areas on the main stem of the Rapidan River since we should expect to see improvements in those areas once the adjacent segments are addressed
- Highest: Potato Run – Rapidan River / Mill Run – Mountain Run
- High: Mine Run / Cedar Run
- Medium: Wilderness Run
- Low: Rapidan-Rapidan River / Fields Run – Rapidan River

Pet Waste BMPs: Focus on Lake of the Woods Area

BMP (Cost-share codes)	Units	Extent
Pet waste disposal station (PW-1)	Station	1
Wastewater treatment system for confined canine facilities (PW-3)	System	1
Pet waste education program	Program	1

BMP (Cost-share codes)	Units	Unit Cost	Extent	Total
Pet waste disposal station (PW-1)	Station	\$2,000	1	\$2,000
Wastewater treatment system for confined canine facilities (PW-3)	System	\$10,000	1	\$10,000
Pet waste education program	Program	\$4,000	1	\$4,000
Total Estimated Cost				\$16,000

BMP (Cost-share codes)	Units	Unit Cost	Stage 1 (100%)
Pet waste disposal station (PW-1)	Station	\$2,000	1
Wastewater treatment system for confined canine facilities (PW-3)	System	\$10,000	1
Pet waste education program	Program	\$4,000	1

Is it reasonable to distribute the agricultural BMPs evenly across each stage? Does this fit into the timeframe decided for each stage back in the septic area? In red text is what is suggested to be implemented in order to see water quality improvements.

Sub-watershed	Estimated total length of streambank in pasture/hay (feet)	Approximate fencing installed to date (feet)	Fencing Still Needed		
			Stage 1 (feet)	Stage 2 (feet)	Stage 3 (feet)
Rapidan-Rapidan River	207,007	106,087	32,598	32,893	30,838
Cedar Run	191,924	54,275	45,525	46,062	42,223
Potato Run-Rapidan River	262,932	69,294	63,414	64,710	62,282
Mill Run-Mountain Run	175,278	75,863	32,809	33,303	31,550
Mine Run	104,343	48,236	18,543	18,782	17,738
Fields Run-Rapidan River	66,290	28,610	11,827	11,932	11,270
Wilderness Run	40,552	0	13,382	13,382	13,382
Total	1,048,325	382,365 (36%)	218,098 (21%)	221,064 (21%)	209,283 (20%)

We've estimated from our previous meeting that 90% of fencing would likely be using wide buffers while the remaining 10% would be narrow buffers. Below is a breakdown of the above table by types of fencing in each sub-watershed.

Sub-watershed	Fencing Needed	SL-6N or WP-2N (10 – 25 ft buffer):10%		SL-6W, SL-6F, WP-2W or CRSL-6 (35 – 50 ft buffer): 90%	
		feet	systems	feet	systems
Rapidan-Rapidan River	96,328	9,633	4	86,696	29
Cedar Run	133,810	13,381	5	120,429	41
Potato Run-Rapidan River	190,406	19,041	7	171,365	58
Mill Run-Mountain Run	97,662	9,766	4	87,896	30
Mine Run	55,063	5,506	2	49,557	17
Fields Run-Rapidan River	35,028	3,503	2	31,526	11
Wilderness Run	40,147	4,015	2	36,132	13
Total	648,445	64,845	26	583,601	199

Proposed stages for land based BMPs needed to reduce bacteria from pasture and cropland:
Are these estimates reasonable and how long should each stage be? 5 years? 10 years?

BMP (Cost-share code)	Stage 1	Stage 2	Stage 3
	Acres		
Extension of watering system (SL-7)	286	286	285
Improved pasture management (SL-10)	9,233	9,232	9,232
Afforestation of crop, hay and pasture land (FR-1)	1,933	3,866	11,597
Permanent vegetative cover on critical areas (SL-11)	20	39	117
Cover crop (SL-8B, SL-8H)	34	35	69
Animal waste control facility (WP-4, WP-4B, WP-4FP, WP-4LL, WP-4SF)	12	13	50
Roof runoff management (WQ-12)	9	8	8
Water control structure (WP-1) – acres treated	0	689	1,377

Overall implementation cost for agricultural practices listed on pages 5 and 6:

Are these costs reasonable?

Practice	Cost-Share Code	Units	Unit Cost	Number of Units	Total
Stream exclusion with narrow width buffer and grazing land management	SL-6N	system	\$60,000	25	\$1,500,000
Stream exclusion with wide width buffer and grazing land management	SL-6W, SL-6F, CRSL-6	system	\$95,000	191	\$18,145,000
Stream protection fencing with narrow width buffer	WP-2N	system	\$10,000	1	\$10,000
Stream protection fencing with wide width buffer	WP-2W	system	\$20,000	8	\$160,000
Exclusion fence maintenance (10 yrs)	N/A	feet	\$5.50	6,484	\$35,662
Extension of watering system	SL-7	acres	\$325	857	\$278,525
Improved pasture management	SL-10	acres	\$150	27,697	\$4,154,550
Critical area stabilization	SL-11	acres	\$1,000	176	\$176,000
Afforestation of crop, hay and pasture land	FR-1	acres	\$3,000	17,396	\$52,188,000
Cover crop	SL-8B, SL-8H	acres	\$100	138	\$13,800
Animal waste control facility	WP-4, WP-4B, WP-4FP, WP-4LL, WP-4SF	system	\$100,000	75	\$7,500,000
Roof runoff management	WQ-12	system	\$2,300	25	\$57,500
Water control structure	WP-1	acres-treated	\$1,200	2,066	\$2,479,200
TOTAL ESTIMATED COST					\$86,698,237

Agricultural Priority Areas:

- Highest: Cedar Run
- High: Potato Run – Rapidan River / Wilderness Run
- Moderate: Mill Run – Mountain Run / Mine Run
- Low: Rapidan-Rapidan River / Fields Run – Rapidan River

Technical Assistance:

Is this reasonable?

- One full-time employee (FTE) for CSWCD for Ag BMPs?
- One full-time employee (FTE) for CSWCD for Residential Septic/Pet Waste BMPs?

Overall Summary

BMP Application	Cost by Stage (assuming 5 year stages)			Total
	Stage 1 (Years 1-5)	Stage 2 (Years 6-10)	Stage 3 (Years 11-15)	
Agricultural	\$15,222,891	\$21,895,336	\$49,580,011	\$86,698,237
Residential	\$7,663,950	\$7,595,950	\$7,541,625	\$22,801,525
Total Estimated Cost	\$22,886,841	\$29,491,286	\$57,121,636	\$109,499,762