



Development of a Water Quality Clean Up Plan

Mountain Run, Mine Run, Cedar Run and Lower Rapidan River Watersheds

November 18th, 2024 Final Public Meeting

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*sign in on the
sign-in sheet on
the table up
front*

Why are we here tonight?

- **Fecal bacteria** levels are used to assess the **Recreational Use** water quality standard.
 - Fecal bacteria organisms originate in the feces of warm-blooded animals. Fecal bacteria, parasites, and viruses can cause both acute (diarrhea and infections) and chronic (ulcers and arthritis) effects in humans

Tonight's meeting:

- Overview of VA's water quality process
- Present draft Clean Up Plan (Implementation Plan)
- Next Steps/ Q&A



Acknowledgements

- Culpeper Soil and Water Conservation
- Culpeper Virginia Cooperative Extension
- Culpeper County Planning and Zoning
- Stevensburg Board of Supervisors
- Rappahannock Rapidan Regional Commission
- Friends of the Rappahannock
- And many more!!



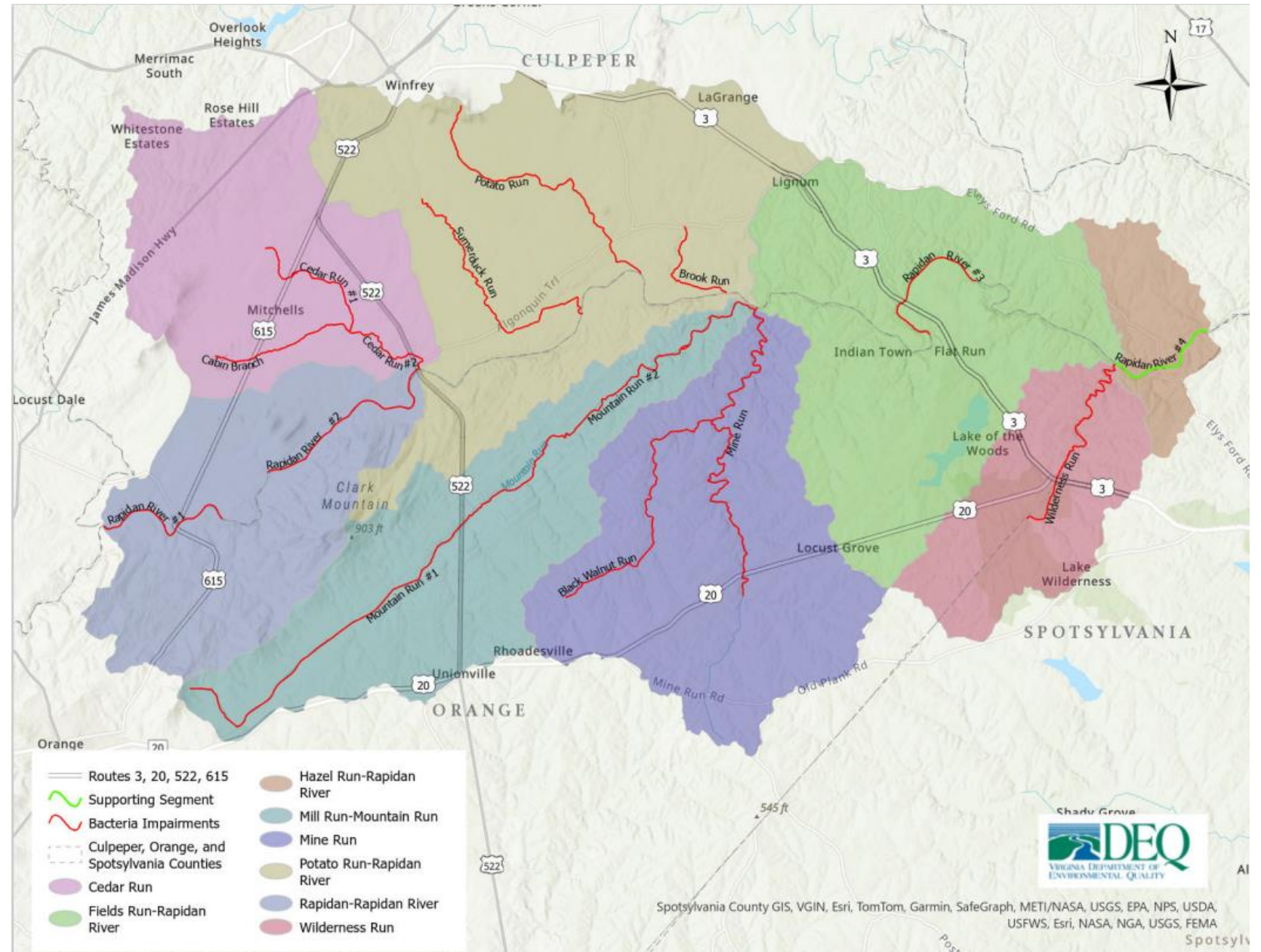
Virginia's Water Quality Process

- Water Quality Monitoring & Assessment:
 - Collect and analyze data
- Reporting
 - Identify impaired waters, 303(d) list under CWA
- Cleanup Studies
 - Plans for restoring impaired waters (TMDL)
- Cleanup Implementation Plans
 - Plans for actions needed to restore water quality (NPS pollution)
 - **We are HERE!**
- Implementing Control Measures
 - Permits (TMDLs), best management practices, cleanup actions
 - 319 Grant funding available for IP NPS BMPs

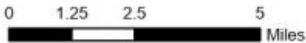
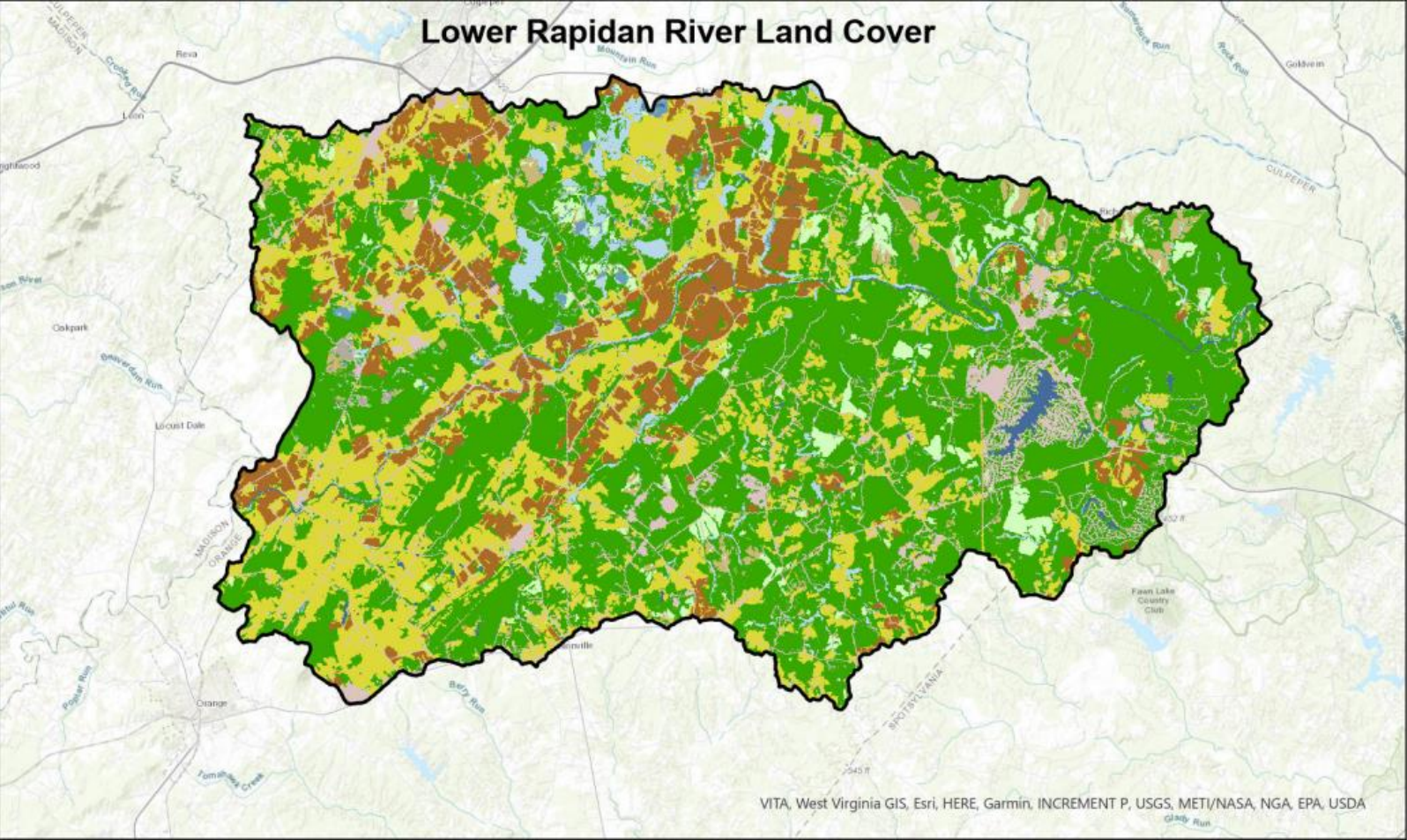


Bacteria Impairments as of 2024 Integrated Report (Draft)

Impairment Name	Watershed (HUC12)
Mine Run	Mine Run
Black Walnut Run	Mine Run
Potato Run	Potato Run – Rapidan River
Sumerduck Run	Potato Run – Rapidan River
Brook Run	Potato Run – Rapidan River
Cedar Run #1	Cedar Run
Cedar Run #2	Cedar Run
Cabin Branch	Cedar Run
Mountain Run #1	Mill Run – Mountain Run
Mountain Run #2	Mill Run – Mountain Run
Rapidan River #1	Rapidan – Rapidan River
Rapidan River #2	Rapidan – Rapidan River
Rapidan River #3	Fields Run – Rapidan River
Rapidan River #4	Hazel Run – Rapidan River
Wilderness Run	Wilderness Run



NLCD Land Use 2019

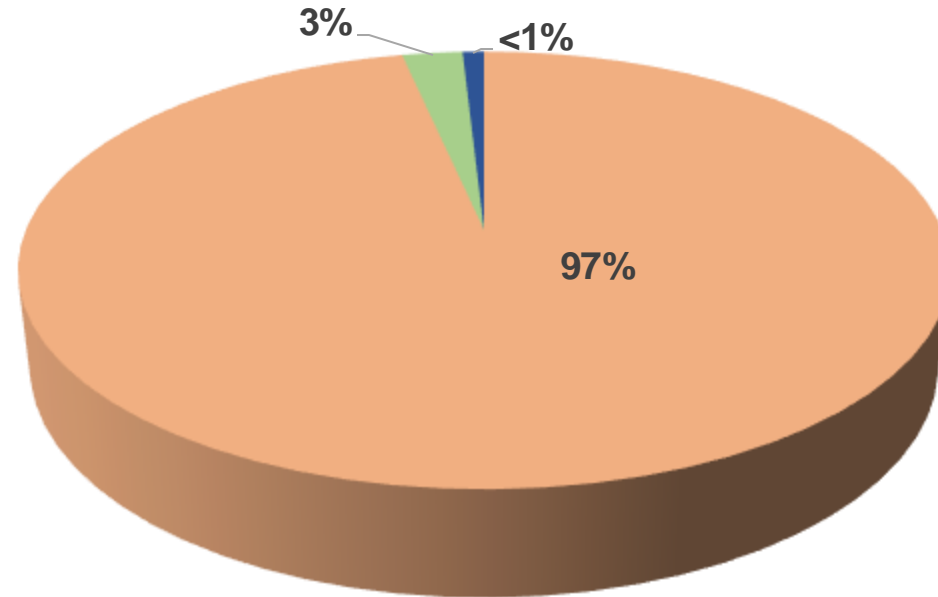


Data Sources: Virginia Department of Environmental Quality, USGS, NLCD 2019
Map Produced: K.Woodall February 1, 2024

Land Use Categories	Percent of Acreage
Open Water	0.8%
Developed Land	8.1%
Barren Land	0.2%
Forest	49.4%
Shrub/Scrub	2.1%
Herbaceous	0.6%
Hay/Pasture	22.8%
Cultivated Crops	9.9%
Woody Wetlands	3.1%
Emergent Herbaceous Wetlands	0.6%



Review of the TMDL study Lower Rapidan River: Bacteria Source Assessment



- Agriculture (pasture/hay, livestock access, cropland): 97%
- Humans (straight pipes and failing septic systems) & Pets: 3%
- Wildlife: <1%

What is a Clean Up Plan... aka Implementation Plan (IP)?

- **What:** Actions to improve water quality (BMPs); Outreach Strategies
- **Where:** Watershed Area
- **When:** Timeline for implementation actions
- **Why:** Measureable Goals
- **Who:** Partners, Funding Sources
- **How much:** Costs

Tells us “How” to improve water quality
for nonpoint sources



Agriculture: BMPs

Fencing needs (includes what's been done since TMDL completed in 2016):

Sub-watershed	Impaired streams in sub-watershed	Estimated total length of streambank in pasture/hay (feet)	Approximate fencing installed to date (feet)	Fencing still needed
Rapidan – Rapidan River	Rapidan River #1 and #2	207,007	106,087	1,760
Cedar Run	Cabin Branch, Cedar Run	191,924	54,275	79,965
Potato Run – Rapidan River	Sumerduck Run, Potato Run, Brook Run	262,932	69,294	174,137
Mill Run – Mountain Run	Mountain Run	175,278	75,863	97,662
Mine Run	Black Walnut Run, Mine Run	104,342	48,236	55,063
Fields Run – Rapidan River	Rapidan River #3	66,290	28,610	0
Wilderness Run	Wilderness Run	40,552	0	40,147
Total		1,048,325	382,365 (36%)	448,735 (43%)

Agriculture: BMPs & Timeline

- Estimated 85% of fencing using wide buffers; 15% narrow buffers
- Exclusion fencing needed to reduce bacteria from direct deposition:

Sub-watershed	Fencing needed	SL-6N or WP-2N (10 – 25 ft buffer): 15%		SL-6W, WP-2W or CRSL-6 (35 – 50 ft buffer): 85%	
	feet	feet	systems	feet	systems
Stage 1 (10 years)					
Rapidan – Rapidan River	1,760	0	0	1,760	1
Cedar Run	40,327	6,049	2	34,278	11
Potato Run – Rapidan River	87,735	13,160	4	74,575	25
Mill Run – Mountain Run	50,338	7,551	3	42,787	14
Mine Run	27,934	4,190	1	23,744	8
Fields Run – Rapidan River	0	0	0	0	0
Wilderness Run	20,276	3,041	1	17,235	6
Total Stage 1	228,370	33,911	11	194,379	65
Stage 2 (10 years)					
Rapidan – Rapidan River	0	0	0	0	0
Cedar Run	39,638	5,946	2	33,692	11
Potato Run – Rapidan River	86,402	12,960	4	73,442	24
Mill Run – Mountain Run	47,325	7,099	3	40,226	13
Mine Run	27,129	4,069	1	23,060	8
Fields Run – Rapidan River	0	0	0	0	0
Wilderness Run	19,871	2,981	1	16,890	6
Total Stage 2	220,365	33,055	11	187,310	62
Total	448,735	67,046	22	381,689	127

Agriculture: BMPs & Timeline

Land based BMPs needed to reduce bacteria from pasture and cropland:

BMP (Cost-share codes in parentheses)	Stage 1 (10 yrs)	Stage 2 (10 yrs)	Total
	Acres (unless otherwise noted)		
Extension of watering system (SL-7)	487	163	650
Improved pasture management (SL-10)	15,730	5,243	20,973
Woodland buffer filter – acres treated (FR-3)	2,013	4,718	6,731
Afforestation of crop, hay and pasture land (FR-1)	1,667	4,998	6,665
Permanent vegetative cover on critical areas (SL-11)	18	52	70
Cover crop (SL-8B, SL-8H)	72	66	138
Animal waste control facility (WP-4, WP-4B, WP-4FP, WP-4LL, WP-4SF)	23 systems	27 systems	50 systems
Roof runoff management (WQ-12)	10 systems	9 systems	19 systems
Water Control Structure – acres treated (WP-1)	377	757	1,134
Stormwater Retention Pond – acres treated (WP-5, WP-7)	757	1,512	2,269

Agriculture: Costs

Overall implementation costs:

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	21	\$1,260,000
Stream exclusion with wide width buffer and grazing land management	SL-6W, SL-6F, CRSL-6	system	\$95,000	121	\$11,495,000
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	6	\$120,000
Exclusion fence maintenance (10 yrs)	CCI	feet	\$5.00	44,874	\$224,370
Extension of watering system	SL-7	acres	\$325	650	\$211,250
Improved pasture management	SL-10	acres	\$150	20,973	\$3,145,950
Woodland buffer filter	FR-3	acres-treated	\$400	6,731	\$2,692,400
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Agriculture: Costs

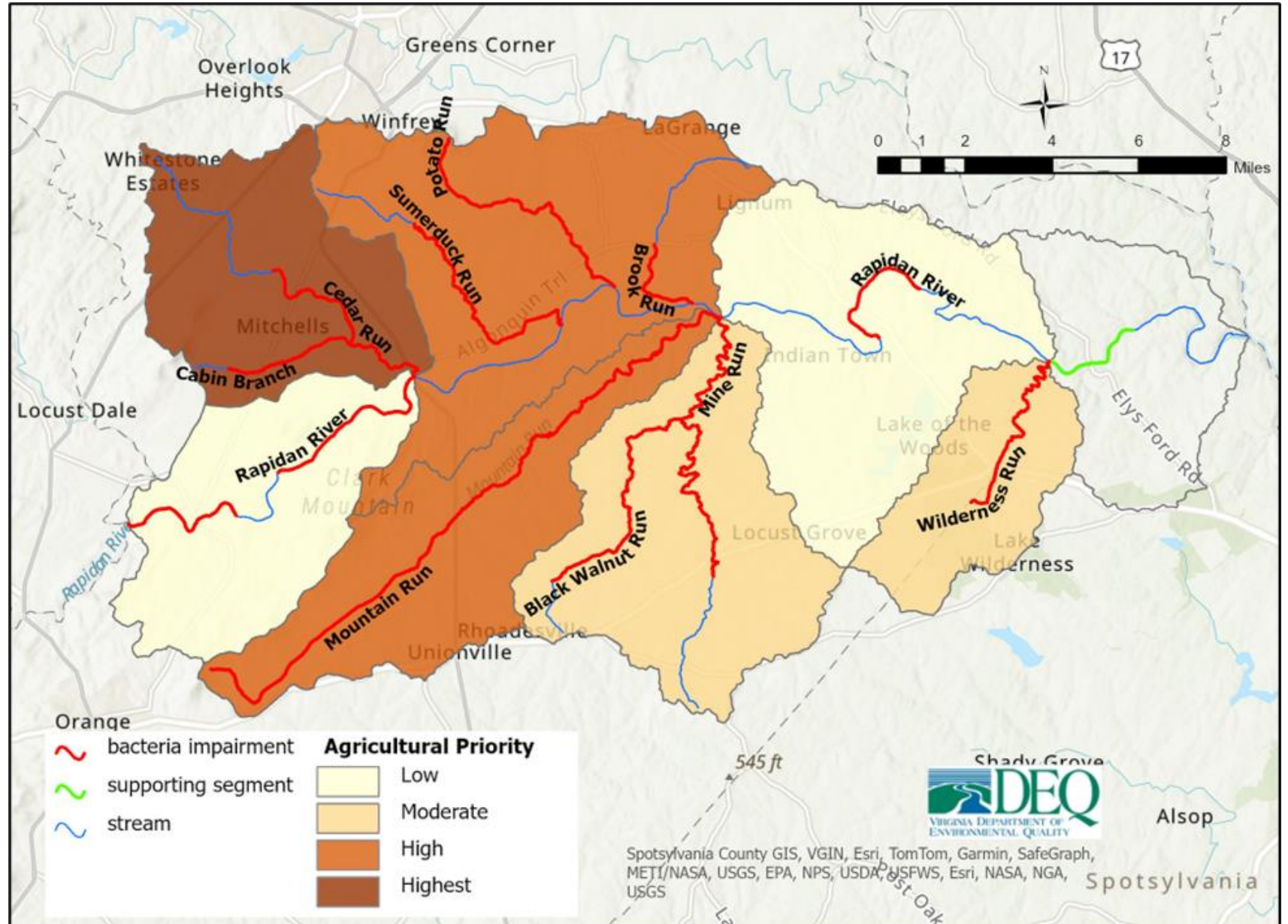
Overall implementation costs:

Practice	Cost-share code	Units	Unit cost	Number of Units	Total
Afforestation of crop, hay and pasture land	FR-1	acres	\$3,000	6,665	\$19,995,000
Critical area stabilization	SL-11	acres	\$1,000	70	\$70,000
Cover crop	SL-8B, SL-8H	system	\$100	138	\$13,800
Animal waste control facility	WP-4, WP-4B, WP-4FP, WP-4LL, WP-4SF	system	\$100,000	50	\$5,000,000
Roof runoff management	WQ-12	acres-treated	\$2,300	19	\$43,700
Water control structure	WP-1	acres-treated	\$1,200	1,134	\$1,360,800
Farm pond	WP-5	acres-treated	\$100	2,269	\$226,900
TOTAL ESTIMATED COST (includes costs on previous slide)					\$45,869,170

Agriculture: Priority Areas

20. Priority areas based on 'need':

Where there are high bacteria loads, high agriculture practices and impaired segments



Residential Septic: BMPs

- More replacements (70%) than repairs (30%)
- More Alternative (52%) than Conventional (48%) systems needed
- 50% repairs would not require a permit
- Third of households would do septic pumpout
- Total repairs and replacements needed:

BMP	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

Residential Septic: Timeline

Residential septic BMPs needed to reduce bacteria:

Description	BMP code	Units	50%	50%	Total
			Stage 1	Stage 2	
Connection to public sewer (RB-2)	RB-2	connec- tion	1	1	2
Connection to public sewer w/pump (RB-2P)	RB-2P		1	0	1
Onsite sewage system repair w/ permit	RB-3	repair	81	80	161
Full inspection and non-permitted onsite sewage system repair	RB-3M		81	80	161
Onsite sewage system installation/replacement	RB-4	system	105	104	209
Onsite sewage system installation/replacement w/ pump	RB-4P		105	104	209
Alternative sewage system	RB-5		224	224	448
Septic tank pump-out	RB-1	pump- out	639	638	1, 277

Residential Septic: Costs

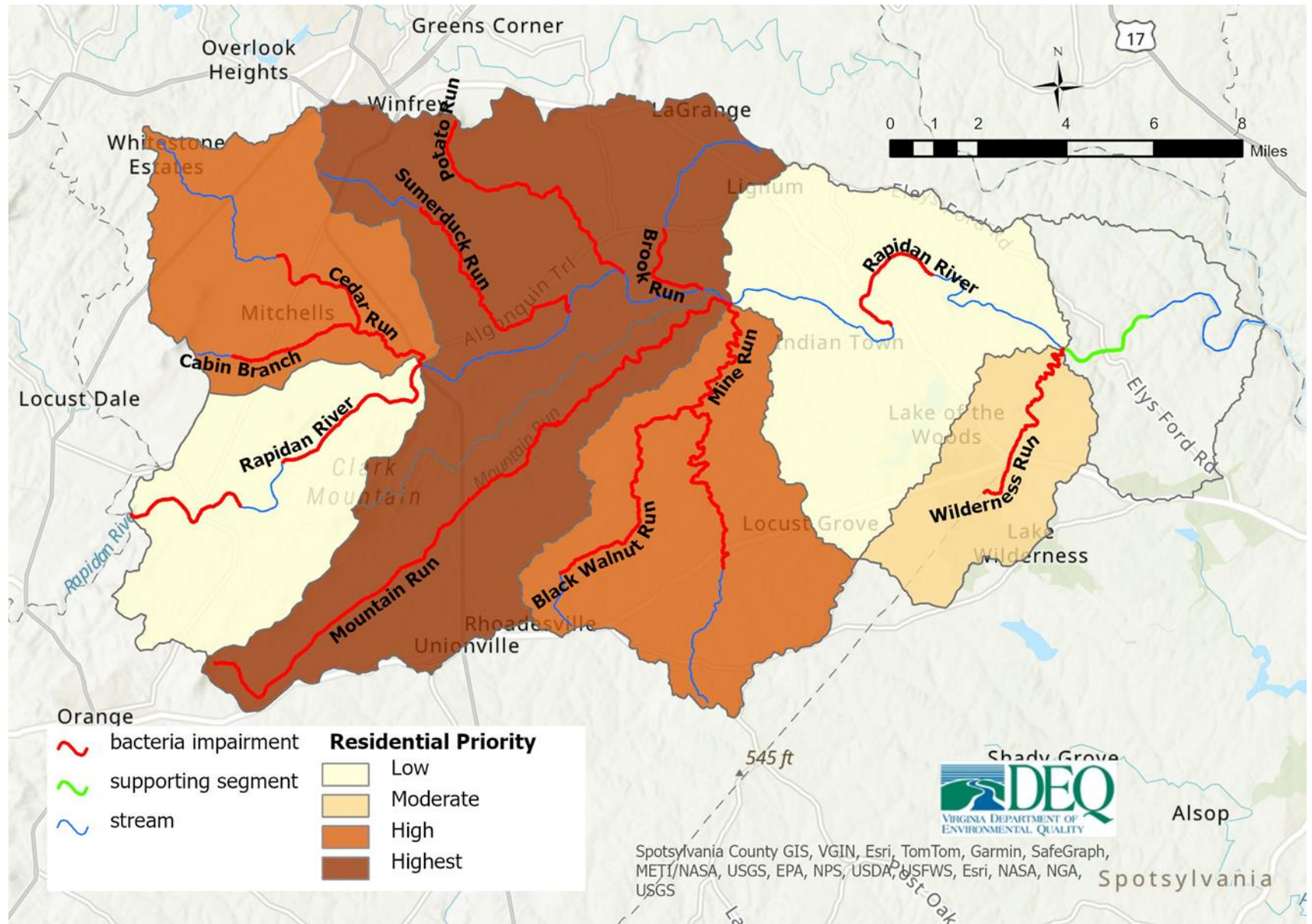
Overall implementation costs:

Practice	Cost-share code	Units	Unit cost	Number of Units	Total
Septic tank pump-out	RB-1	system	\$450	1,277	\$574,650
Connection to public sewer	RB-2	system	\$12,500	2	\$25,000
Connection to public sewer w/pump	RB-2P	system	\$20,500	1	\$20,500
Septic tank system repair	RB-3	repair	\$7,500	161	\$1,207,500
Septic system inspection and non-permitted repairs	RB-3M	repair	\$4,875	161	\$784,875
Septic tank system installation or replacement	RB-4	system	\$12,500	209	\$2,612,500
Septic tank system installation/replacement w/ pump	RB-4P	system	\$16,500	209	\$3,448,500
Alternative waste treatment system	RB-5	system	\$31,500	448	\$14,112,000
TOTAL ESTIMATED COST					\$22,785,525

Residential Septic: Priority Areas

9. Priority areas based on 'need':

Where there is the greatest need for alternative septic systems and where there are the most failing septic systems



Pet Waste: BMPs

Total BMPs needed, with focus on Lake of the Woods community for pet waste stations and the Fields Run – Rapidan River watershed for a confined canine facility:

BMP (Cost-share codes in parentheses)	Units	Extent
Pet waste disposal station (PW-1)	Station	6
Wastewater treatment system for confined canine facilities (PW-3)	System	1
Pet waste education program	Program	1

Pet Waste: Timeline

Staged implementation goals:

Description	BMP code	Units	44%	56%	Total
			Stage 1	Stage 2	
Pet waste disposal station	PW-1	station	3	3	6
Large scale pet waste treatment system	PW-3	system	0	1	1
Pet waste education program	N/A	program	1	1	1

Pet Waste: Costs

Overall implementation costs:

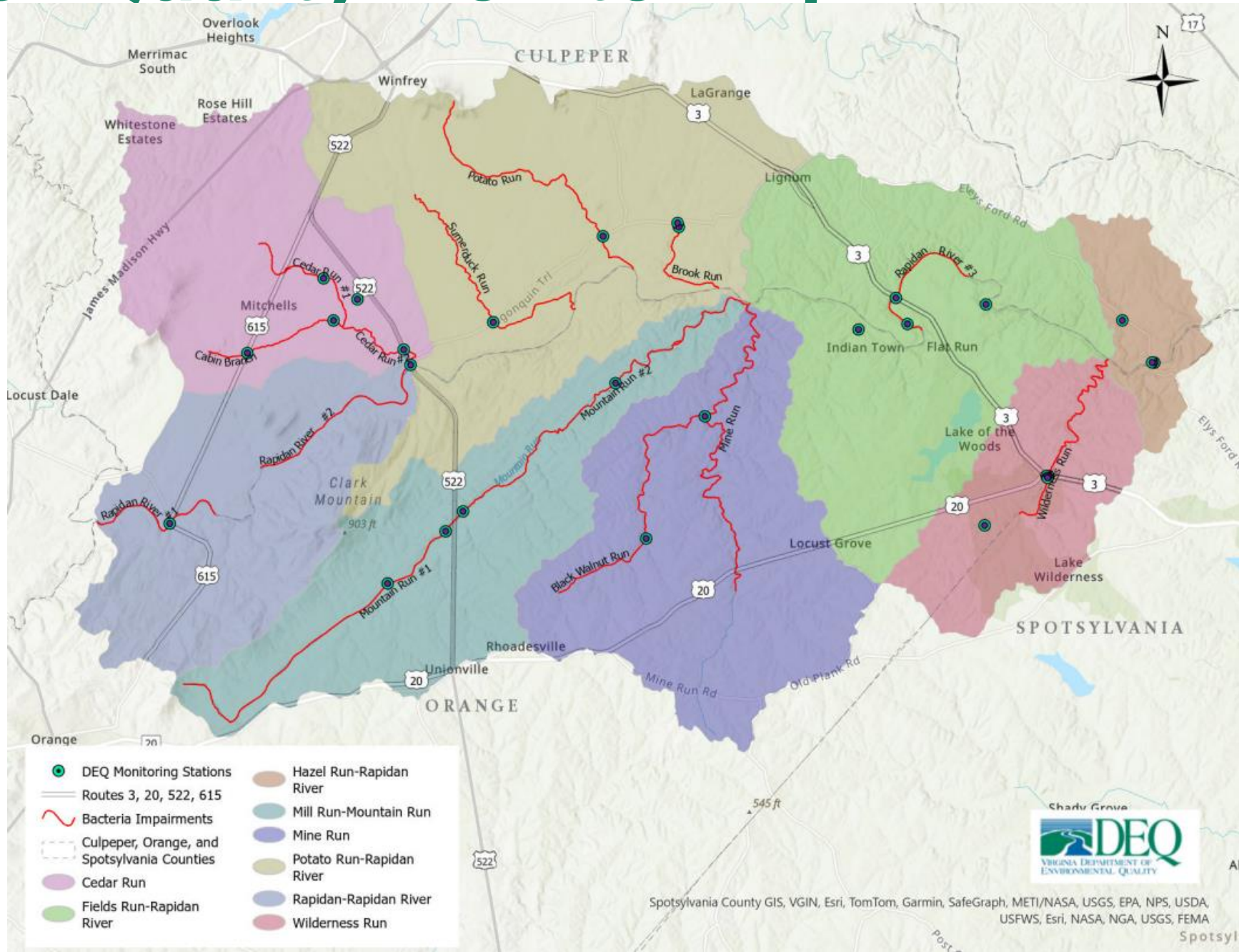
Practice	Cost-share code	Units	Unit cost	Number of Units	Total
Pet waste disposal station	PW-1	station	\$2,000	6	\$12,000
Large scale pet waste treatment system	PW-3	system	\$10,000	1	\$10,000
Pet waste education program	N/A	program	\$4,000	1	\$4,000
TOTAL ESTIMATED COST					\$260,000

Education and Outreach

- Contact landowners to raise awareness of cost-share options for agricultural and residential septic BMPs
 - Culpeper Soil and Water Conservation District
 - Virginia Cooperative Extension, 4-H
- Farm tours and field days
- Social media/newspaper
- Yard signs/mailers/door hangers
- Develop and distribute educational materials and coordinate with VDH
- Word of mouth!



Water Quality Monitoring



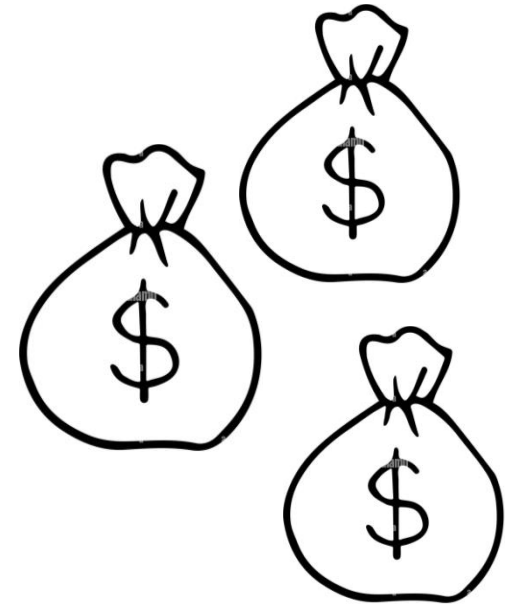
Overall Summary

Total costs (BMP and TA) by stage:

BMP Application	Cost by Stage		Total
	Stage 1 (Years 1–10)	Stage 2 (Years 11–20)	
Agricultural	\$17,837,460	\$28,031,710	\$45,869,170
Residential	\$11,443,925	\$11,367,600	\$22,811,525
Total estimated BMP cost	\$29,281,385	\$39,399,310	\$68,680,695
Total estimated TA cost	\$1,300,000	\$1,300,000	\$2,600,000
OVERALL ESTIMATED COST	\$30,581,385	\$40,699,310	\$71,280,695

How are we going to pay for it?

- USEPA 319(h) Nonpoint Source Funds (available through DEQ)
- Virginia Agricultural Cost-Share (VACS) Program & Tax Credit
- Virginia Conservation Assistance Program (VCAP)
- National Fish and Wildlife Foundation (NFWF)
- USDA Programs – CRP/CREP/EQIP
- State Water Quality Improvement Fund (WQIF)
- Clean Water State Revolving Funds (CWSRF)
- Southeast Rural Community Assistance Project (SERCAP)
- Virginia Trees for Clean Water Program
- Community Development Block Grant (CDBG) Program
- USDA Natural Resource Conservation Service and Forest Service Joint Chiefs' Landscape Restoration Partnership
- ... and others



Next Steps

	Tentative Date
First Public Meeting	February 21st, 2024 (Public comment period February 21 st , 2024 – March 22, 2024)
Community Engagement Meetings	
# 1	April 12th, 2024
# 2	June 26th, 2024
Final Public Meeting	November 18th, 2024 Public comment period 30 days after Final Public Meeting. Draft plan can be found on our website (https://www.deq.virginia.gov/home/showpublisheddocument/26751) or by contacting Madison
EPA Acceptance	TBD

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Questions?