Residential Working Group - 1st Formal Meeting 12/13/10 @ 3:30pm

James River and Tributaries – Richmond TMDL Implementation Plan Development
Goochland, Powhatan, Henrico, Chesterfield Counties and City of Richmond, VA
Facilitator: Margaret Smigo (804)527-5124 Margaret.Smigo@deq.virginia.gov
Recorder: _____ Next WG Meeting:_____

Agenda

1. **Introductions & Sign-In**
2. **Steering Committee (select yes or no on sign-in if you'd like to join)**
3. **Review of 11/16/10 Brainstorming Session – Questions**
4. **Goal of Meeting: Review BMP Data & Answer Group Questions**
    a. Septic Repair/Replacement/Pump-outs
    b. Pet Education/Pet Composters
    c. Review of costs/unit
    d. Review of costs/unit by impaired watershed
5. **Set next Residential WG meeting date/time with 2 back-up dates (must be an evening meeting)**
6. ***Open discussion (as time allows)***

Total Maximum Daily Load (TMDL) Study Results

Almond, Bernards, Falling, Gillie, Goode, No Name, Powhite, and Reedy Creeks and the James River riverine and tidal do not meet water quality standards for bacteria. These standards are designed to identify waters that are not suitable for "primary contact recreation" (swimming) because of the risk of illness. The TMDL study identified the sources of bacteria and how much each source category needs to be reduced so that the stream is safe for swimming and other recreational activities.

The implementation plan will outline a staged approach to meet the reductions to human, pet, and agricultural sources determined in the TMDL study. Wildlife is considered a background condition and reductions to wildlife bacteria loads are not explicitly addressed in the TMDL implementation plan.

Residential Waste Treatment BMPs Needed

In order to meet the water quality standards, BMPs are needed to effectively treat the waste from residential homes. Table 1 shows the estimated needs in all impaired watersheds. It was estimated that 5% of the failing septic systems would need new alternative treatment systems installed. Of the remaining failing septic systems, 70% would be corrected with conventional septic systems and 30% would be septic system repairs. It was also

estimated that all of the straight pipe corrections would be with standard septic systems. The number of septic tank pump-outs needed was estimated as 50% of the number of currently installed septic systems.

Table 1. Estimated Residential Waste Treatment BMPs Needed (non-cumulative).

Impairment	Potential Failing Septic Systems	Potential Straight Pipes	Septic System Repairs	New Septic Systems	Alternative Systems	Septic Pump-Outs
Almond Creek	35	2	10	25	2	148
Bernards Creek	43	3	12	32	2	601
Falling Creek	152	7	43	108	8	2,853
Gillies Creek	81	21	23	75	4	281
Goode Creek	4	2	1	5	0	37
James River (riverine)	779	113	222	631	39	3,867
James River (tidal)	470	60	134	372	24	4,797
No Name Creek	6	1	2	5	0	51
Powhite Creek	44	4	13	33	2	644
Reedy Creek	5	4	1	8	0	59
Project Total	**1,619**	**217**	**461**	**1,294**	**81**	**13,338**

Questions for the group:

- Does the breakdown between septic repairs, new septic systems, and new alternative systems apply in these watersheds?

- Does Sewer Hook-up need to be added to the estimates? In which watersheds would they be applicable? At what % of the total need (total failing/repairs/new)?

Residential NPS BMPs Needed

In order to meet the water quality standards, additional BMPs are needed that prevent dog waste bacteria from traveling to surface waters. Table 2 shows the estimated residential NPS BMPs needed.

Table 2. Estimated Residential land-based BMPs Needed.

Control Measure Unit	Pet Waste Education Program System	Pet Waste Composters Number
Almond Creek	1	544
Bernards Creek	1	73
Falling Creek	1	0
Gillies Creek	1	5,840
Goode Creek	1	3,100
James River (lower)	1	19,679
James River (tidal)	1	0
No Name Creek	1	305
Powhite Creek	1	2,493
Reedy Creek	1	0

Residential BMP Cost Estimates

The costs in Table 3 are consistent with the Lynchburg IP and other IPs in Virginia.

Table 3. Estimated Costs of Residential BMPs.

Residential Control Measure	Unit	Cost per Unit
Septic Systems Pump-outs (RB-1)	System	$450 [2]
Septic System Repair (RB-3)	System	$3,500
Septic System Installation/Replacement (RB-4)	System	$4,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000 [1]
Pet Waste Education Program	System	$3,750
Pet Waste Composters	Composters	$50

[1] Per VDH [2] Cost from recent pump-out (DEQ homeowner paid)

Question for the group:

- Do these costs apply in these watersheds?

Possible Scenario to meet Stages I and II– Almond Creek

The numbers of BMPs needed were broken down evenly in Stage I and Stage II phases. This final Stage II scenario returns a 26.1% reduction to bacteria loads to Almond Creek. To implement the final TMDL, the total load reduction required is 52.9% (no wildlife load reductions). The remaining reductions will come from Agricultural and Urban BMPs.

Almond Creek BMPs	Unit	Cost per unit	Units Needed	Total Cost
Residential Control Meas ures:				
STAGE I				
Septic Systems Pump-outs (RB-1)	System	$450	74	$33,300
Septic System Repair (RB-3)	System	$3,500	5	$17,500
Septic System Installation/Replacement (RB-4)	System	$4,000	13	$52,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	1	$20,000
Pet Waste Education Program	System	$3,750	1	$3,750
Pet Waste Composters	Composters	$50	272	$13,600
Stage I Residential Subtotal				*$140,150*
STAGE II				
Septic Systems Pump-outs (RB-1)	System	$450	74	$33,300
Septic System Repair (RB-3)	System	$3,500	5	$17,500
Septic System Installation/Replacement (RB-4)	System	$4,000	12	$48,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	1	$20,000
Pet Waste Education Program	System	$3,750	0	$0
Pet Waste Composters	Composters	$50	272	$13,600
Stage II Residential Subtotal				*$132,400*
Residential Total				**$272,550**

Possible Scenario to meet Stages I and II – Bernards Creek

The numbers of BMPs needed were broken down evenly in Stage I and Stage II phases. This final Stage II scenario returns a 23.9% reduction to bacteria loads to Bernards Creek. To implement the final TMDL, the total load reduction required is 64.6% (no wildlife load reductions). The remaining reductions will come from Agricultural BMPs.

Bernards Creek BMPs	Unit	Cost per	Units Needed	Total
Residential Control Measures:				
STAGE I				
Septic Systems Pump-outs (RB-1)	System	$450	301	$135,450
Septic System Repair (RB-3)	System	$3,500	6	$21,000
Septic System Installation/Replacement (RB-4)	System	$4,000	16	$64,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	1	$20,000
Pet Waste Education Program	System	$3,750	1	$3,750
Pet Waste Composters	Composters	$50	37	$1,850
Stage I Residential Subtotal				*$246,050*
STAGE II				
Septic Systems Pump-outs (RB-1)	System	$450	300	$135,000
Septic System Repair (RB-3)	System	$3,500	6	$21,000
Septic System Installation/Replacement (RB-4)	System	$4,000	16	$64,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	1	$20,000
Pet Waste Education Program	System	$3,750	0	$0
Pet Waste Composters	Composters	$50	36	$1,800
Stage II Residential Subtotal				*$241,800*
Residential Total				**$487,850**

Possible Scenario to meet Stages I and II – Powhite Creek

The numbers of BMPs needed were broken down evenly in Stage I and Stage II phases. This final Stage II scenario returns a 69.6% reduction to bacteria loads to Powhite Creek. To implement the final TMDL, the total load reduction required is 69.7% (no wildlife load reductions). The remaining reductions will come from Agricultural BMPs.

Powhite Creek BMPs	Unit	Cost per	Units Needed	Total
Residential Control Measures:				
STAGE I				
Septic Systems Pump-outs (RB-1)	System	$450	322	$144,900
Septic System Repair (RB-3)	System	$3,500	7	$24,500
Septic System Installation/Replacement (RB-4)	System	$4,000	17	$68,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	1	$20,000
Pet Waste Education Program	System	$3,750	1	$3,750
Pet Waste Composters	Composters	$50	1247	$62,350
Stage I Residential Subtotal				*$323,500*
STAGE II				
Septic Systems Pump-outs (RB-1)	System	$450	322	$144,900
Septic System Repair (RB-3)	System	$3,500	6	$21,000
Septic System Installation/Replacement (RB-4)	System	$4,000	16	$64,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	1	$20,000
Pet Waste Education Program	System	$3,750	0	$0
Pet Waste Composters	Composters	$50	1246	$62,300
Stage II Residential Subtotal				*$312,200*
Residential Total				**$635,700**

Possible Scenario to meet Stages I and II – Falling Creek

The numbers of BMPs needed were broken down evenly in Stage I and Stage II phases. This final Stage II scenario returns a 10.1% reduction to bacteria loads to Falling Creek. To implement the final TMDL, the total load reduction required is 10.1% (no wildlife load reductions).

Falling Creek BMPs	Unit	Cost per	Units Needed	Total Cost
Residential Control Measures:				
STAGE I				
Septic Systems Pump-outs (RB-1)	System	$450	1,427	$642,150
Septic System Repair (RB-3)	System	$3,500	22	$77,000
Septic System Installation/Replacement (RB-4)	System	$4,000	54	$216,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	4	$80,000
Pet Waste Education Program	System	$3,750	1	$3,750
Pet Waste Composters	Composters	$50	1,247	$62,350
Stage I Residential Subtotal				*$1,081,250*
STAGE II				
Septic Systems Pump-outs (RB-1)	System	$450	1,426	$641,700
Septic System Repair (RB-3)	System	$3,500	21	$73,500
Septic System Installation/Replacement (RB-4)	System	$4,000	54	$216,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	4	$80,000
Pet Waste Education Program	System	$3,750	0	$0
Pet Waste Composters	Composters	$50	1,246	$62,300
Stage II Residential Subtotal				*$1,073,000*
Residential Total				**$2,154,250**

Possible Scenario to meet Stages I and II – Gillie Creek

The numbers of BMPs needed were broken down evenly in Stage I and Stage II phases. This final Stage II scenario returns a 30.0% reduction to bacteria loads to Gillie Creek. To implement the final TMDL, the total load reduction required is 88.4% (no wildlife load reductions).

Gillie Creek BMPs	Unit	Cost per	Units Needed	Total
Residential Control Measures:				
STAGE I				
Septic Systems Pump-outs (RB-1)	System	$450	141	$63,450
Septic System Repair (RB-3)	System	$3,500	12	$42,000
Septic System Installation/Replacement (RB-4)	System	$4,000	38	$152,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	2	$40,000
Pet Waste Education Program	System	$3,750	1	$3,750
Pet Waste Composters	Composters	$50	2,920	$146,000
Stage I Residential Subtotal				*$447,200*
STAGE II				
Septic Systems Pump-outs (RB-1)	System	$450	140	$63,000
Septic System Repair (RB-3)	System	$3,500	11	$38,500
Septic System Installation/Replacement (RB-4)	System	$4,000	37	$148,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	2	$40,000
Pet Waste Education Program	System	$3,750	0	$0
Pet Waste Composters	Composters	$50	2,920	$146,000
Stage II Residential Subtotal				*$435,500*
Residential Total				**$882,700**

Possible Scenario to meet Stages I and II – Goode Creek

The numbers of BMPs needed were broken down evenly in Stage I and Stage II phases. This final Stage II scenario returns a 87.4% reduction to bacteria loads to Goode Creek. To implement the final TMDL, the total load reduction required is 87.4% (no wildlife load reductions).

Goode Creek BMPs	Unit	Cost per	Units Needed	Total
Residential Control Measures:				
STAGE I				
Septic Systems Pump-outs (RB-1)	System	$450	19	$8,550
Septic System Repair (RB-3)	System	$3,500	1	$3,500
Septic System Installation/Replacement (RB-4)	System	$4,000	3	$12,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	0	$0
Pet Waste Education Program	System	$3,750	1	$3,750
Pet Waste Composters	Composters	$50	1,550	$77,500
Stage I Residential Subtotal				*$105,300*
STAGE II				
Septic Systems Pump-outs (RB-1)	System	$450	18	$8,100
Septic System Repair (RB-3)	System	$3,500	0	$0
Septic System Installation/Replacement (RB-4)	System	$4,000	2	$8,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	0	$0
Pet Waste Education Program	System	$3,750	0	$0
Pet Waste Composters	Composters	$50	1,550	$77,500
Stage II Residential Subtotal				*$93,600*
Residential Total				**$198,900**

Possible Scenario to meet Stages I and II – NoName Creek

The numbers of BMPs needed were broken down evenly in Stage I and Stage II phases. This final Stage II scenario returns a 75% reduction to bacteria loads to NoName Creek. To implement the final TMDL, the total load reduction required is 75% (no wildlife load reductions).

NoName Creek BMPs	Unit	Cost per	Units Needed	Total
Residential Control Measures:				
STAGE I				
Septic Systems Pump-outs (RB-1)	System	$450	26	$11,700
Septic System Repair (RB-3)	System	$3,500	1	$3,500
Septic System Installation/Replacement (RB-4)	System	$4,000	3	$12,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	0	$0
Pet Waste Education Program	System	$3,750	1	$3,750
Pet Waste Composters	Composters	$50	153	$7,650
Stage I Residential Subtotal				*$38,600*
STAGE II				
Septic Systems Pump-outs (RB-1)	System	$450	25	$11,250
Septic System Repair (RB-3)	System	$3,500	1	$3,500
Septic System Installation/Replacement (RB-4)	System	$4,000	2	$8,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	0	$0
Pet Waste Education Program	System	$3,750	0	$0
Pet Waste Composters	Composters	$50	152	$7,600
Stage II Residential Subtotal				*$98,750*
Residential Total				**$137,350**

Possible Scenario to meet Stages I and II – Reedy Creek**

The numbers of BMPs needed were broken down evenly in Stage I and Stage II phases. This final Stage II scenario returns a 2.5% reduction to bacteria loads to Reedy Creek. To implement the final TMDL, the total load reduction required is 2.5% (no wildlife load reductions).

Reedy Creek BMPs	Unit	Cost per	Units Needed	Total
Residential Control Measures:				
STAGE I				
Septic Systems Pump-outs (RB-1)	System	$450	30	$13,500
Septic System Repair (RB-3)	System	$3,500	1	$3,500
Septic System Installation/Replacement (RB-4)	System	$4,000	4	$16,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	0	$0
Pet Waste Education Program	System	$3,750	1	$3,750
Pet Waste Composters	Composters	$50	500	$25,000
Stage I Residential Subtotal				*$61,750*
STAGE II				
Septic Systems Pump-outs (RB-1)	System	$450	29	$13,050
Septic System Repair (RB-3)	System	$3,500	0	$0
Septic System Installation/Replacement (RB-4)	System	$4,000	4	$16,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	0	$0
Pet Waste Education Program	System	$3,750	0	$0
Pet Waste Composters	Composters	$50	500	$25,000
Stage II Residential Subtotal				*$54,050*
Residential Total				**$115,800**

****Reedy estimates will be revised once additional scenario has been developed, so numbers here may change (become higher). Faciliator has added 1 pet education system and 1000 pet composters. Derived from TMDL information and does not yet include additional scenario for newer data.**

Possible Scenario to meet Stages I and II – James River (riverine)

The numbers of BMPs needed were broken down evenly in Stage I and Stage II phases. This final Stage II scenario returns a 40.5% reduction to bacteria loads to the James River (riverine). To implement the final TMDL, the total load reduction required is 73.7% (no wildlife load reductions). The remaining reductions will come from Agricultural and Urban BMPs.

James River (riverine) Creek BMPs	Unit	Cost per	Units Needed	Total Cost
Residential Control Measures:				
STAGE I				
Septic Systems Pump-outs (RB-1)	System	$450	1,934	$870,300
Septic System Repair (RB-3)	System	$3,500	111	$388,500
Septic System Installation/Replacement (RB-4)	System	$4,000	316	$1,264,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	20	$400,000
Pet Waste Education Program	System	$3,750	1	$3,750
Pet Waste Composters	Composters	$50	9,840	$492,000
Stage I Residential Subtotal				*$3,418,550*
STAGE II				
Septic Systems Pump-outs (RB-1)	System	$450	1,933	$869,850
Septic System Repair (RB-3)	System	$3,500	111	$388,500
Septic System Installation/Replacement (RB-4)	System	$4,000	315	$1,260,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	19	$380,000
Pet Waste Education Program	System	$3,750	0	$0
Pet Waste Composters	Composters	$50	9,839	$491,950
Stage II Residential Subtotal				*$3,014,100*
Residential Total				**$6,432,650**

Possible Scenario to meet Stages I and II – James River (tidal)

The numbers of BMPs needed were broken down evenly in Stage I and Stage II phases. This final Stage II scenario returns a 2.4% reduction to bacteria loads to the James River (tidal). To implement the final TMDL, the total load reduction required is 2.4% (no wildlife load reductions).

James River (tidal) Creek BMPs	Unit	Cost per	Units Needed	Total Cost
Residential Control Measures:				
STAGE I				
Septic Systems Pump-outs (RB-1)	System	$450	2,399	$1,079,550
Septic System Repair (RB-3)	System	$3,500	67	$234,500
Septic System Installation/Replacement (RB-4)	System	$4,000	186	$744,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	12	$240,000
Pet Waste Education Program	System	$3,750	0	$0
Pet Waste Composters	Composters	$50	0	$0
Stage I Residential Subtotal				*$2,298,050*
STAGE II				
Septic Systems Pump-outs (RB-1)	System	$450	2,398	$1,079,100
Septic System Repair (RB-3)	System	$3,500	67	$234,500
Septic System Installation/Replacement (RB-4)	System	$4,000	186	$744,000
Alternative Waste Treatment System Installation (RB-5)	System	$20,000	12	$240,000
Pet Waste Education Program	System	$3,750	0	$0
Pet Waste Composters	Composters	$50	0	$0
Stage II Residential Subtotal				*$2,297,600*
Residential Total				**$4,495,650**