4. Article Two, B.5- Water Quality Monitoring ("WQM") Plan – Report on whether any of the semi-annual (or annual) WQM required under Article Two, B.5, was conducted during the quarter, and if so, in which sewer basins, and report the results of that monitoring (both BST and fecal coliform) for each such sewer basin.

Broad Creek-

a.

The second semi-annual round of water quality monitoring was conducted on October 18, 2012. Twenty of the twenty-six sewer basins were sampled. Human source fecal bacteria were identified by library-based Polymerase Chain Reaction (PCR) testing in one or more samples from sixteen sewer basins; however, human sources were confirmed in only nine of these basins using an independent verification test as discussed below.

As part of continuing re-evaluation of the Water Quality Monitoring Plan and of the methodologies used, the Virginia Tech laboratory that provides the Bacterial Source Tracking (BST) testing services now conducts a library-independent verification test for human bacterial sources using a quantitative PCR (qPCR) analytical method on all samples. These results are presented below.

The 2013 annual round of water quality sampling is planned for March, and results will be reported in the Second Quarter of 2013.

Basins Subject to Semi-Annual Monitoring and Reporting Requirements:

	BST Results: (A	Enterococcus CFU/100ml)
	Human – 0%	
	(qPCR <u>Negative</u> for human))
	Avian – 41%	
BRC001 – downstream	Canine – 9%	123
(Henson Creek)	Deer – 10%	123
	Horse – 0%	
	Misc. Wildlife – 23%	
	Non-human Unknown – 17%	
	Human – 0%	
	(qPCR Negative for human))
	Avian – 38%	
BRC002 – upstream	Canine – 10%	97
(Henson Creek)	Deer – 8%	91
	Horse – 0%	

b. Cabin John-]	Fecal Bacteria Results:
	BST Results:	(Enterococcus CFU/100ml)
	Human – 9%	
CBJ001 – downstream	(qPCR Negative for human)
	Avian – 33%	
	Canine – 11%	117
	Deer – 6%	
	Horse – 0%	
	Misc. Wildlife – 21%	
	Non-human Unknown – 20%	

Misc. Wildlife – 21%

Non-human Unknown – 23%

	Human – 6%	
	(qPCR <u>Negative</u> for human)	
	Avian – 39%	
CBJ002 – upstream	Canine – 7%	73
	Deer – 11%	13
	Horse – 0%	
	Misc. Wildlife – 19%	
	Non-human Unknown – 18%	

c. Horsepen- Fecal Bacteria Results: (Enterococcus CFU/100ml)

	Doi Results.	Emerococcus Cro/100mi
	Human – 18%	
	(qPCR <u>Positive</u> for human)	
	Avian – 26%	
HSP001 – downstream	Canine – 7%	800
1151 001 – downstream	Deer – 11%	800
	Horse – 9%	
	Misc. Wildlife – 15%	
	Non-human Unknown – 14%	
	Human – 5%	
	(qPCR <u>Negative</u> for human)	
	Avian – 31%	
HSP002 – upstream	Canine – 10%	153
	Deer – 6%	133
	Horse – 11%	
	Misc. Wildlife – 21%	
	Non-human Unknown – 16%	

d. Indian Creek-

BST Results:	(<i>Enterococcus</i> CFU/100ml
Human – 0%	
(qPCR Negative for human	
Avian – 28%	
Canine – 9%	63
Deer – 6%	03
Horse – 12%	
Misc. Wildlife – 23%	
Non-human Unknown – 22%	
Human – 4%	
(qPCR <u>Negative</u> for human	
Avian – 26\(\overline{\pi}\)	
Canine – 11%	385
Deer – 9%	363
Horse – 11%	
Misc. Wildlife – 22%	
Non-human Unknown – 17%	
	Human – 0% (qPCR Negative for human Avian – 28% Canine – 9% Deer – 6% Horse – 12% Misc. Wildlife – 23% Non-human Unknown – 22% Human – 4% (qPCR Negative for human Avian – 26% Canine – 11% Deer – 9% Horse – 11% Misc. Wildlife – 22%

e. Little Falls-

Fecal Bacteria Results:

c. Little Falls-	_	i ccai i	Dacteria Results.	
	BST Results:	(Enterd	ococcus CFU/100r	nl)
	Human – 3% (4%)			
	(qPCR Negative for human	1)		
	Avian – 34% (31%)			
LECOO1 downstrage	Canine – 12% (13%)		185 (170)	
LFS001 – downstream	Deer – 11% (11%)			
	Horse – 0% (0%)			
	Misc. Wildlife – 19% (20%)			
	Non-human Unknown – 21% (2	21%)		
	Human – 9%			
	(qPCR Negative for human	1)		
	Avian – 31%			
LFS002 – upstream	Canine – 9%		317	
	Deer – 12%		31/	
	Horse – 0%			
	Misc. Wildlife – 21%			
	Non-human Unknown – 18%			

Note: Values in parentheses for station LFS001 are for field duplicate sample.

BST Results:

f. Lower Anacostia-

Fecal Bacteria Results:

(Enterococcus CFU/100ml)

	Human – 0%	
	(qPCR <u>Negative</u> for human)	
	Avian – 41%	
ANA001 – downstream	Canine – 8%	50
ANAOO1 – downstream	Deer – 12%	30
	Horse – 0%	
	Misc. Wildlife – 17%	
	Non-human Unknown – 22%	
	Human – 2% (3%)	
	(qPCR <u>Negative</u> for human)	
	Avian – 37% (34%)	
ANA002 – upstream	Canine – 10% (11%)	95 (101)
	Deer – 11% (9%)	93 (101)
	Horse – 0% (0%)	
	Misc. Wildlife – 21% (23%)	
	Non-human Unknown – 19% (20%)	

Note: Values in parentheses for station ANA002 are for field duplicate sample.

g. Lower Beaverdam Creek-

Fecal Bacteria Results:

BST	Results:
-----	-----------------

(Enterococcus CFU/100ml)

	Do I Results.	icrococcus CI O/1001
	Human – 9%	
	(qPCR <u>Negative</u> for human)	
	Avian – 30%	
LBD001 – downstream	Canine – 8%	110
LBD001 – downstream	Deer – 10%	110
	Horse – 0%	
	Misc. Wildlife – 26%	
	Non-human Unknown – 17%	
	Human – 16%	
	(qPCR <u>Positive</u> for human)	
	Avian – 27%	
LBD002 – upstream	Canine – 10%	185
	Deer – 8%	163
	Horse – 0%	
	Misc. Wildlife – 19%	
	Non-human Unknown – 20%	

h. Muddy Branch-

Fecal Bacteria Results:

BST Results:

(Enterococcus CFU/100ml)

	_ = = = = = = = = (Dividio Coccus CI C/ 10011
	Human – 0%	
	(qPCR <u>Negative</u> for human)
	Avian – 36%	
MDB001 – downstream	Canine – 12%	332
Wibboot – downstream	Deer – 10%	332
	Horse – 0%	
	Misc. Wildlife – 23%	
	Non-human Unknown – 19%	
	Human – 7%	
	(qPCR <u>Negative</u> for human)
	Avian – 34%	
MDB002 – upstream	Canine – 12%	240
	Deer – 13%	240
	Horse – 0%	
	Misc. Wildlife – 13%	
	Non-human Unknown – 21%	

i. Northeast Branch-

BST Results:	(Enterococcus CFU/100ml)
TT 00/	

NEB001 – upstream	Human – 0% (qPCR Negative for human) Avian – 39% Canine – 12%	42
-	Deer – 8% Horse – 0%	

	Misc. Wildlife – 25%	
	Non-human Unknown – 16%	
	Human – 0%	
	(qPCR <u>Negative</u> for human)	
	Avian – 36%	
NEB002 – downstream	Canine – 15%	20
NEBUUZ – downstream	Deer – 11%	20
	Horse – 0%	
	Misc. Wildlife – 20%	
	Non-human Unknown – 18%	

j. Northwest Branch-

Fecal Bacteria Results:

J				
	BST Results:	(Ente	rococcus CFU/100	ml)
NWA001 – downstream	Too few bacteria for BST sourc	e	<10	
NWA001 – downstream	determination		<10	
	Human – 8%			
	(qPCR Negative for humar	n)		
	Avian – 27%			
NWA 002 unstraam	Canine – 12%		305	
NWA002 – upstream	Deer – 11%		303	
	Horse – 0%			
	Misc. Wildlife – 27%			
	Non-human Unknown – 15%			

k. Oxon Run-

	BST Results:	(Enterococcus CFU/100r
	Human – 5%	
	(qPCR Negative for humar	n)
	Avian – 34%	
OXN001 – downstream	Canine – 12%	108
OANOO1 – downstream	Deer – 9%	100
	Horse – 0%	
	Misc. Wildlife – 21%	
	Non-human Unknown – 19%	
	Human – 24%	
	(qPCR <u>Positive</u> for human)	n)
	Avian – 38%	
OXN002 – upstream	Canine – 10%	1,467
(Watts Branch)	Deer – 6%	1,407
	Horse – 0%	
	Misc. Wildlife – 11%	
	Non-human Unknown – 11%	

l. **Paint Branch-**

Fecal Bacteria Results:

(Enter	ococcus	CFU	/100m1)
Line	UUUUUU	\sim 1 \odot	, , , , , , , , , , , , , , , , , , , ,	,

	BST Results:	Enterococcus CFU/100ml
PNT001 – downstream	Human – 0% (qPCR Negative for human Avian – 34% Canine – 16% Deer – 10% Horse – 0% Misc. Wildlife – 19% Non-human Unknown – 21%	97
PNT002 – upstream	Human – 0% (qPCR Negative for human Avian – 31% Canine – 12% Deer – 13% Horse – 0% Misc. Wildlife – 24% Non-human Unknown – 20%	122

Parkwaym.

Fecal Bacteria Results:

BST Results: (Enterococcus CFU/100ml)

	Do I Results.	(Linerococcus Cr O/100III
	Human – 19%	
	(qPCR <u>Positive</u> for human)
	Avian – 23%	
PKY001 – downstream	Canine – 4%	482
(Bear Branch)	Deer – 9%	462
	Horse – 0%	
	Misc. Wildlife – 28%	
	Non-human Unknown – 17%	
	Human – 16%	
	(qPCR <u>Positive</u> for human)
	Avian – 31%	
PKY002 – upstream	Canine – 3%	547
(Walker Branch)	Deer – 11%	347
	Horse – 0%	
	Misc. Wildlife – 19%	
	Non-human Unknown – 20%	

n. Piscataway-

	n. Piscataway-	1	ecai Bacteria Results:
		BST Results:	Enterococcus CFU/100ml)
		Human – 0%	
		(qPCR <u>Negative</u> for human)
	PSW001 – downstream	Avian – 33%	87
	PS W 001 – downstream	Canine – 9%	87
		Deer – 15%	
		Horse 0%	

	Misc. Wildlife – 22%	
	Non-human Unknown – 21%	
	Human – 0%	
	(qPCR <u>Negative</u> for human)	
	Avian – 35%	
PSW002 – upstream	Canine – 11%	102
15 w 002 – upstream	Deer – 9%	102
	Horse – 0%	
	Misc. Wildlife – 26%	
	Non-human Unknown – 19%	

o. Rock Creek-

Fecal Bacteria Results: (*Enterococcus* CFU/100ml)

o. Roch Cich		ccui Ducteria Results.
	BST Results:	(Enterococcus CFU/100ml
	Human – 7%	
	(qPCR Negative for human	
	Avian – 34%	
RKC001 – downstream	Canine – 11%	290
RKC001 – downstream	Deer – 8%	290
	Horse – 0%	
	Misc. Wildlife – 23%	
	Non-human Unknown – 17%	
	Human – 0%	
	(qPCR Negative for human	n)
	Avian – 31%	
RKC002 – upstream	Canine – 12%	35
	Deer – 11%	
	Horse – 0%	
	Misc. Wildlife – 25%	
	Non-human Unknown – 21%	

p. Seneca Creek-

Fecal Bacteria Results: (*Enterococcus* CFU/100ml)

	Human – 14%	
	(qPCR <u>Positive</u> for human)	
	Avian – 29%	
SNC001 – downstream	Canine – 11%	175
SNC001 – downstream	Deer – 6%	1/3
	Horse – 0%	
	Misc. Wildlife – 23%	
	Non-human Unknown – 17%	
	Human – 20%	
	(qPCR <u>Positive</u> for human)	
SNC002 unstraam	Avian – 33%	287
SNC002 – upstream	Canine – 10%	201
	Deer – 7%	
	Horse – 0%	

BST Results:

Misc. Wildlife – 17%	
Non-human Unknown – 13%	

q. Sligo Creek-BST Results:

1. ~g	BST Results:	(Enterococcus CFU/100ml)
SLC001 – downstream	Human – 17% (qPCR Positive for human Avian – 33% Canine – 9% Deer – 4% Horse – 0% Misc. Wildlife – 20%	
SLC002 – upstream	Non-human Unknown – 17% Human – 6% (qPCR Negative for huma Avian – 35% Canine – 11% Deer – 7% Horse – 0%	nn) 162
	Misc. Wildlife – 25% Non-human Unknown – 16%	

r. Upper Beaverdam Creek-

Fecal Bacteria Results:

Fecal Bacteria Results:

BST Results: (Enterococcus CFU/100ml)

	Doi Results. (Line	rococcus CI O/10011
	Human – 21%	
UBD001 – downstream	(qPCR <u>Positive</u> for human)	
	Avian – 28%	
	Canine – 10%	210
	Deer – 6%	
	Horse – 0%	
	Misc. Wildlife – 20%	
	Non-human Unknown – 15%	
UBD002 – upstream	Human – 13%	
	(qPCR <u>Positive</u> for human)	
	Avian – 27%	
	Canine – 8%	195
	Deer – 13%	
	Horse – 0%	
	Misc. Wildlife – 17%	
	Non-human Unknown – 22%	

s. Watts Branch-

Fecal Bacteria Results:

si vides Bidien	i ceui Ductei iu Resuitsi	
	BST Results:	(Enterococcus CFU/100m)
WTB001 – downstream	Human – 16%	
	(qPCR <u>Positive</u> for human	n)
	Avian – 25%	
	Canine – 13%	270
	Deer – 10%	270
	Horse – 0%	
	Misc. Wildlife – 19%	
	Non-human Unknown – 17%	
WTB002 – upstream	Human – 11%	
	(qPCR Positive for human	n)
	Avian -27%	
	Canine – 8%	310
	Deer – 12%	310
	Horse – 0%	
	Misc. Wildlife – 24%	
	Non-human Unknown – 18%	

t. Western Branch-

Fecal Bacteria Results:

t. Western Branch-	Fecal Bacteria Results:		
	BST Results: (Interococcus CFU/100ml)	
WNB001 – downstream	Human – 9%		
	(qPCR Negative for human)	
	Avian – 31%		
	Canine – 9%	107	
	Deer – 7%	107	
	Horse – 0%		
	Misc. Wildlife – 21%		
	Non-human Unknown – 23%		
WNB002 – upstream	Human – 15% (10%)		
	(qPCR <u>Positive</u> for human)		
	Avian – 29% (31%)		
	Canine – 11% (8%)	162 (137)	
	Deer – 8% (7%)	102 (137)	
	Horse – 0% (0%)		
	Misc. Wildlife – 23% (23%)		
	Non-human Unknown – 14% (2	1%)	

Note: Values in parentheses for station WNB002 are for field duplicate sample.

Basins Subject to Annual Monitoring and Reporting Requirements-

BST Results: Fecal Bacteria Results: (*Enterococcus* CFU/100ml)

- a. Dulles Interceptor-
- b. Mattawoman-
- c. Monacacy-
- d. Patuxent Center-
- e. Patuxent North-
- f. Rock Run-