

- 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.**

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:

a. Broad Creek- Fecal Bacteria Results:
BST Results: (Enterococcus CFU/100ml)

BRC001 – downstream (Henson Creek)	Human – 0% (qPCR <u>Negative</u> for human) Avian – 41% Canine – 9% Deer – 10% Horse – 0% Misc. Wildlife – 23% Non-human Unknown – 17%	123
BRC002 – upstream (Henson Creek)	Human – 0% (qPCR <u>Negative</u> for human) Avian – 38% Canine – 10% Deer – 8% Horse – 0% Misc. Wildlife – 21% Non-human Unknown – 23%	97

b. Cabin John- Fecal Bacteria Results:
BST Results: (Enterococcus CFU/100ml)

CBJ001 – downstream	Human – 9% (qPCR <u>Negative</u> for human) Avian – 33% Canine – 11% Deer – 6% Horse – 0% Misc. Wildlife – 21% Non-human Unknown – 20%	117
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CBJ002 – upstream	Human – 6% (qPCR <u>Negative</u> for human) Avian – 39% Canine – 7% Deer – 11% Horse – 0% Misc. Wildlife – 19% Non-human Unknown – 18%	73
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c. Horsepen-

Fecal Bacteria Results:

BST Results:

(Enterococcus CFU/100ml)

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

d. Indian Creek-

Fecal Bacteria Results:

BST Results:

(Enterococcus CFU/100ml)

INC001 – downstream	Human – 0% (qPCR <u>Negative</u> for human) Avian – 28% Canine – 9% Deer – 6% Horse – 12% Misc. Wildlife – 23% Non-human Unknown – 22%	63
INC002 – upstream	Human – 4% (qPCR <u>Negative</u> for human) Avian – 26% Canine – 11% Deer – 9% Horse – 11% Misc. Wildlife – 22% Non-human Unknown – 17%	385

e. Little Falls-		Fecal Bacteria Results: (<i>Enterococcus</i> CFU/100ml)
BST Results:		
LFS001 – downstream	Human – 3% (4%) (qPCR <u>Negative</u> for human) Avian – 34% (31%) Canine – 12% (13%) Deer – 11% (11%) Horse – 0% (0%) Misc. Wildlife – 19% (20%) Non-human Unknown – 21% (21%)	185 (170)
LFS002 – upstream	Human – 9% (qPCR <u>Negative</u> for human) Avian – 31% Canine – 9% Deer – 12% Horse – 0% Misc. Wildlife – 21% Non-human Unknown – 18%	317

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

f. Lower Anacostia-		Fecal Bacteria Results: (<i>Enterococcus</i> CFU/100ml)
BST Results:		
ANA001 – downstream	Human – 0% (qPCR <u>Negative</u> for human) Avian – 41% Canine – 8% Deer – 12% Horse – 0% Misc. Wildlife – 17% Non-human Unknown – 22%	50
ANA002 – upstream	Human – 2% (3%) (qPCR <u>Negative</u> for human) Avian – 37% (34%) Canine – 10% (11%) Deer – 11% (9%) Horse – 0% (0%) Misc. Wildlife – 21% (23%) Non-human Unknown – 19% (20%)	95 (101)

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

g. Lower Beaverdam Creek-		Fecal Bacteria Results:
BST Results:		<i>(Enterococcus CFU/100ml)</i>
LBD001 – downstream	Human – 9% (qPCR <u>Negative</u> for human) Avian – 30% Canine – 8% Deer – 10% Horse – 0% Misc. Wildlife – 26% Non-human Unknown – 17%	110
LBD002 – upstream	Human – 16% (qPCR <u>Positive</u> for human) Avian – 27% Canine – 10% Deer – 8% Horse – 0% Misc. Wildlife – 19% Non-human Unknown – 20%	185

h. Muddy Branch-		Fecal Bacteria Results:
BST Results:		<i>(Enterococcus CFU/100ml)</i>
MDB001 – downstream	Human – 0% (qPCR <u>Negative</u> for human) Avian – 36% Canine – 12% Deer – 10% Horse – 0% Misc. Wildlife – 23% Non-human Unknown – 19%	332
MDB002 – upstream	Human – 7% (qPCR <u>Negative</u> for human) Avian – 34% Canine – 12% Deer – 13% Horse – 0% Misc. Wildlife – 13% Non-human Unknown – 21%	240

i. Northeast Branch-		Fecal Bacteria Results:
BST Results:		<i>(Enterococcus CFU/100ml)</i>
NEB001 – upstream	Human – 0% (qPCR <u>Negative</u> for human) Avian – 39% Canine – 12% Deer – 8% Horse – 0%	42

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

j. Northwest Branch-**Fecal Bacteria Results:****BST Results:***(Enterococcus CFU/100ml)*

NWA001 – downstream	Too few bacteria for BST source determination	<10
NWA002 – upstream	Human – 8% (qPCR <u>Negative</u> for human) Avian – 27% Canine – 12% Deer – 11% Horse – 0% Misc. Wildlife – 27% Non-human Unknown – 15%	305

k. Oxon Run-**Fecal Bacteria Results:****BST Results:***(Enterococcus CFU/100ml)*

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

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

m. Parkway-	BST Results:	Fecal Bacteria Results: (<i>Enterococcus</i> CFU/100ml)
PKY001 – downstream (Bear Branch)	Human – 19% (qPCR <u>Positive</u> for human) Avian – 23% Canine – 4% Deer – 9% Horse – 0% Misc. Wildlife – 28% Non-human Unknown – 17%	482
PKY002 – upstream (Walker Branch)	Human – 16% (qPCR <u>Positive</u> for human) Avian – 31% Canine – 3% Deer – 11% Horse – 0% Misc. Wildlife – 19% Non-human Unknown – 20%	547

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

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

o. Rock Creek-

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

RKC001 – downstream	Human – 7% (qPCR <u>Negative</u> for human) Avian – 34% Canine – 11% Deer – 8% Horse – 0% Misc. Wildlife – 23% Non-human Unknown – 17%	290
RKC002 – upstream	Human – 0% (qPCR <u>Negative</u> for human) Avian – 31% Canine – 12% Deer – 11% Horse – 0% Misc. Wildlife – 25% Non-human Unknown – 21%	35

p. Seneca Creek-

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

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

	Misc. Wildlife – 17% Non-human Unknown – 13%	
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q. Sligo Creek-**Fecal Bacteria Results:****BST Results:***(Enterococcus CFU/100ml)*

SLC001 – downstream	Human – 17% (qPCR <u>Positive</u> for human) Avian – 33% Canine – 9% Deer – 4% Horse – 0% Misc. Wildlife – 20% Non-human Unknown – 17%	273
SLC002 – upstream	Human – 6% (qPCR <u>Negative</u> for human) Avian – 35% Canine – 11% Deer – 7% Horse – 0% Misc. Wildlife – 25% Non-human Unknown – 16%	162

r. Upper Beaverdam Creek-**Fecal Bacteria Results:****BST Results:***(Enterococcus CFU/100ml)*

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

s. Watts Branch-		Fecal Bacteria Results: (<i>Enterococcus</i> CFU/100ml)
BST Results:		
WTB001 – downstream	Human – 16% (qPCR <u>Positive</u> for human) Avian – 25% Canine – 13% Deer – 10% Horse – 0% Misc. Wildlife – 19% Non-human Unknown – 17%	270
WTB002 – upstream	Human – 11% (qPCR <u>Positive</u> for human) Avian – 27% Canine – 8% Deer – 12% Horse – 0% Misc. Wildlife – 24% Non-human Unknown – 18%	310

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

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-**