

Illicit Connection Sampling along the Lower Neponset River, 2012

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Introduction

In the Fall of 2012 sampling was conducted at a number of outfalls along the lower Neponset River to help determine the extent of illicit connections discharging from outfalls along the river. This investigation was similar to previous investigations of these outfalls completed in 2008. All samples were collected during dry weather.

In 2008 there were several outfalls that showed extremely high levels of bacteria as well as high concentrations of both ammonia and surfactants (Figure 3, Table 1). Many of these locations were already known to have problems by the Boston Water and Sewer Commission (BWSC), the owner of many of the outfalls. The investigations in 2012 aimed to reexamine many of these outfalls to ascertain if any improvements had been made since 2008 and also give a more up to date characterization of current water quality conditions at the various locations.

Results

The results in 2012 were very similar to those in 2008. Sites showed similar levels of contamination across sampling years.

Outfall 7HSD0105 had bacteria levels as high as 77,010 MPN/100mL in 2008 and in 2012 showed a level greater than 241,960 MPN/100mL. This site also had elevated levels of ammonia and surfactants both in 2008 and 2012. In 2012 the levels of ammonia and surfactants were higher than in 2008 and were also higher than the test limit for each parameter (Tables 1-2). There was also a very pervasive smell of sewage at this location and other evidence of an illicit sewer connection(s)(Figure 1). There was an obvious discoloration to the discharge and there were floatables present consistent with the remnants of toilet paper and sewer discharges (Figure 1).

Site 4FSD0204 also showed extremely high levels of bacteria in 2012 which was consistent with levels observed in 2008. Levels for bacteria were found to be greater than 241,960 MPN/100mL both times samples were taken at this outfall in 2012. In

addition, the levels of surfactants found at this outfall were also higher than the test for surfactants (>3.0 mg/L)(Table 1-2). This location also showed visible evidence of an illicit connection with some floatables present as well as a discolored discharge that was consistent with a sewage connection of some sort(Figure 2).

Location 7HSDO285 also had elevated levels of bacteria but not as elevated as those found in 2008. The levels of ammonia and surfactants however were the same or higher than those found in 2008 (Table 1-2). This location, directly beneath the Blue Hills Parkway bridge on the border of Milton and Mattapan, is extremely difficult to sample due to the speed of the current under the bridge as well as the high rate of discharge normally seen at this outfall.

Outfalls 6GSDO110 and 3FSDO162 showed similar intermittent signs of potential illicit connections between 2008 and 2012 (Tables 1-2). These outfalls both have shown elevated levels of bacteria as well as elevated levels of either ammonia, surfactants or both.

The one outfall that did show somewhat divergent results between sampling in 2008 and sampling in 2012 was outfall 2FSDO120. This outfall showed little to no sign of an obvious illicit connection in 2008 when bacteria levels and ammonia and surfactant levels were all shown to be quite low. However there were elevated levels of bacteria exhibited on 10/23/2012 when the bacteria level was 1732.9 MPN/100mL. This elevated bacteria level on its own is not indicative of an illicit connection but does illustrate the potential need to further investigate this outfall on a more regular basis in the future.

Brief Discussion

The outfalls that have discharges during dry weather along the Lower Neponset River show different levels of potential to harbor illicit connections. Some show obvious signs of impairment while others have more subtle cues to problems within the catchment systems.

In terms of priority it would be the opinion of the Neponset River Watershed Association that outfalls 7HSDO105, 4FSDO204 and 7HSDO285 be given the highest priority with regard to both investigation of the obvious problems these outfalls have with illicit connections as well as the highest priority regarding the actual elimination of these issues. Additionally, while not sampled in 2012, outfall 6GSDO108 showed extremely high levels of bacteria in 2008 along with elevated levels of both ammonia and surfactants consistent with impairment from illicit connections. NepRWA also believes that this outfall should be given the highest priority level available.

A second tier of investigations should include the remaining outfalls investigated here as well as any others that are found to exhibit intermittent or constant discharges during dry weather. Particular attention should be given to outfalls 6GSDO110, 5FSDO117, 3FSDO160 and 3FSDO162 since each of these outfalls exhibited elevated levels for bacteria during investigations.

Tables

Table 1: Data collected at outfall locations along the Lower Neponset River in 2008.

BWSC ID	NepRWA ID	Date	E.coli (MPN/100mL)	Ammonia (mg/L)	Surfactants (mg/L)
7HSDO105	SDO105	8/27/2008	4,884.0	2.464	1.5
7HSDO105	SDO105	9/11/2008	77,010.0	2.223	1.5
6GSDO108	SDO108	8/27/2008	>241,960	>3.000	1.5
6GSDO108	SDO108	9/11/2008	1,480.0	>3.000	0.8
5FSDO117	SDO117	8/5/2008	3,448.0	0.034	0.3
5FSDO117	SDO117	9/3/2008	>24,196.0	0.082	0.0
2FSDO120	SDO120	8/5/2008	216.0	0.026	0.3
2FSDO120	SDO120	9/3/2008	186.0	0.025	0.0
3FSDO159	SDO159	8/5/2008	0.0	0.173	0.0
3FSDO159	SDO159	9/3/2008	0.0	0.083	0.0
3FSDO160	SDO160	8/5/2008	15,531.0	0.498	0.3
3FSDO160	SDO160	9/3/2008	1,723.0	0.386	0.3
3FSDO162	SDO162	8/5/2008	0.0	2.510	0.3
3FSDO162	SDO162	9/3/2008	>24,196.0	1.861	0.3
5GSDO171	SDO171	9/3/2008	41.0	0.018	0.0
4FSDO204	SDO204	8/5/2008	1,553,100.0	2.306	>3.0
4FSDO204	SDO204	9/3/2008	>24,196.0	2.252	>3.0
7HSDO285	SDO285	8/27/2008	51,720.0	2.210	>3.0
7HSDO285	SDO285	9/11/2008	41,060.0	2.155	>3.0

Table 2: Data collected at outfall locations along the Lower Neponset River in 2012

BWSC ID	NepRWA ID	Date	E.coli (MPN/100mL)	Ammonia (mg/L)	Surfactants (mg/L)
7HSDO105	SDO105	10/23/2012	>241,960	>3.000	>3.0
6SDOG110	SDO110	9/25/2012	9,804.0	0.623	0.5
5FSDO117	SDO117	9/25/2012	NS	NS	NS
2FSDO120	SDO120	9/25/2012	17.1	0.163	0.0
2FSDO120	SDO120	10/23/2012	1,732.9	0.025	0.0
3FSDO159	SDO159	9/25/2012	40.2	0.024	0.0
3FSDO159	SDO159	10/23/2012	4.1	0.112	0.0
3FSDO162	SDO162	9/25/2012	33.6	0.182	0.0
3FSDO162	SDO162	10/23/2012	>2,419.6	0.044	0.0
4FSDO204	SDO204	9/25/2012	>241,960	0.822	>3.0
4FSDO204	SDO204	10/23/2012	>241,960	0.485	>3.0
7HSDO285	SDO285	10/23/2012	6,893.0	>3.000	>3.0

Figures

Figure 1: Image taken of outfall 7HSD0105 on 10/23/2012.



Figure 2: Image of outfall 4FSD0204 on 09/25/2012.



Figure 3: Map of Neponset River outfalls sampled in 2008 and 2012.

