

# Harbor Watch Record of Sewage Spill Detection in Norwalk Harbor and the Lower Norwalk River

Harbor Watch (HW), a Program of Earthplace, the Nature Discovery Center has discovered a number of sewage leaks from storm drain systems and bypass pipes during the last three years of research . All these situations were promptly repaired by the City of Norwalk. Enclosed is a listing of the various leaks and their repairs.



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**Methods and Procedures:**

Water monitoring is carried out under protocols of an EPA Quality Assurance Project Plan (QAPP RFA#10160 approved by the EPA for five years on 9/16/10). Each monitoring team is comprised of an experienced leader and one to three trained volunteers. Water samples are collected at established monitoring sites within the watershed (QAPP Appendix A1.1). These sites, which represent the more impacted areas, were selected in concert with the CT DEEP, because results from the first year’s study consistently demonstrated elevated fecal coliform bacteria counts at these locations.

The following tests are run *in situ*: dissolved oxygen (QAPP Appendix A3.3) and conductivity (QAPP Appendix A3.8). Water and air temperatures, as well as general observations and storm events are also recorded at each site visit. Observations are recorded (QAPP Appendix 5) on the HW Data Sheet according to the quality control requirements (QAPP Appendix 3.1).

Upon return to the lab, fecal coliform and *E. coli* bacteria membrane filtration tests (QAPP Appendix A3.13) are performed and analyzed according to Standard Methods, 21<sup>st</sup> edition (9222D & 9222G) and recorded (QAPP Appendix 5) on the HW bacteria log.

*E. coli* bacteria will be evaluated using the criteria published in the CT DEEP Surface Water Quality Standards, 2/25/11. The CT DEEP *E. coli* criteria for Class AA, A, and B water are established at three levels (Table 1).

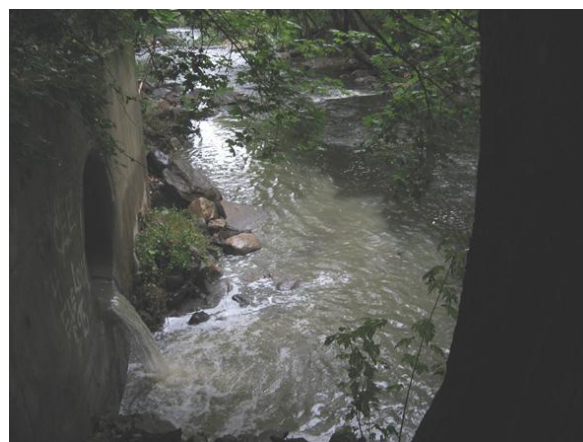
**Table 1** CT DEP criterion for *E. coli* bacteria levels as applied to recreational use, effective 2/25/11

<b>Designated Use Recreation</b>	<b>Class</b>	<b>Indicator</b>	<b>Criteria</b>
Designated Swimming	AA, A, B	<i>Escherichia coli</i>	Geometric Mean less than 126 CFUs/100mLs; Single Sample Maximum 235 CFUs/100mLs
Non-designated Swimming	AA, A, B	<i>Escherichia coli</i>	Geometric Mean less than 126 CFUs/100mLs; Single Sample Maximum 410 CFUs/100mLs
All Other Recreational Uses	AA, A, B	<i>Escherichia coli</i>	Geometric Mean less than 126 CFUs/100mLs; Single Sample Maximum 576 CFUs/100mLs

The Norwalk River is classified by the CT DEEP for “all other recreational uses” because the river is too shallow for swimming with the exception of a few impoundments. The report will focus on *E. coli* bacteria levels; because it is the indicator bacteria of choice by the CT DEP.

### School Street Storm Drain System: 9/28/08

The School Street storm drain network is found just to the north side of the Post Road on the east bank of the river near one of the HW traditional water monitoring sites known as NR1. Weekly monitoring at Site NR1 began to show very high *E. coli* bacteria counts on two separate dates. During a site inspection in the area of Site NR1, a HW employee observed a stream of grey water coming from the School Street storm drain discharge. Subsequent *E. coli* bacteria tests by HW of water collected directly from the pipe showed elevated bacteria counts indicative of raw sewage. The results of the test were immediately reported by HW to the Norwalk Health Department who notified the city's WPCA. A detailed investigation by the WPCA was made of the School Street drainage system which disclosed that a subcontractor of CL&P had mistakenly hooked a bypass sewer line into the School Street network of pipes. The problem was discovered and repaired within four hours.



School Street drain discharging to the Norwalk River in 2008. The grey sewage plume is visible traveling downstream.

*E. coli* bacteria concentrations on the Norwalk River in 2008. The testing dates 9/18 and 9/24 show the elevated observed concentrations that sparked the interest in investigating the area and ultimately the discovery of the School St discharge.

Sites	5/1/2008	5/7/2008	5/15/2008	5/21/2008	6/4/2008	6/11/2008	6/19/2008	6/25/2008	7/2/2008	7/9/2008	7/17/2008	7/23/2008
NR23	60	40	76	140	1700	1100	130	360	n/a	146	148	2300
NR22	0	0	0	0	1	1	0	0	0	0	1	n/a
NR21	68	32	76	148	1800	780	130	52	480	180	252	9800
NR20	88	28	108	168	3200	930	270	158	420	136	88	80
NR15	56	36	88	108	470	400	190	124	n/a	760	164	500
NR13	520	26	156	92	600	730	270	320	1100	232	144	460
NR9.5	94	18	56	88	400	340	92	156	1760	146	140	570
NR9	108	32	68	104	2600	500	200	140	n/a	68	88	380
NR6	104	68	212	148	1200	810	430	272	1060	360	168	3800
NR4	120	112	360	228	1300	330	170	380	800	440	380	6100
SM3	84	96	124	112	3100	430	520	220	460	900	6700	1100
NR1	72	96	88	188	1400	500	530	176	2800	200	270	6300

8/7/2008	8/13/2008	8/20/2008	8/27/2008	9/4/2008	9/10/2008	9/18/2008	9/24/2008	Geomean	%frequency over 410 colonies/100mLs
260	460	144	320	640	400	100	152	244	21.05%
0	0	0	0	0	0	0	0		0.00%
190	200	110	140	150	30	120	44	175	20.00%
100	160	80	40	212	130	120	108	152	15.00%
420	160	232	140	480	220	170	340	203	25.00%
290	160	244	360	400	180	160	124	247	25.00%
150	220	88	158	3600	356	96	156	188	15.00%
100	180	68	38	2200	260	112	72	155	15.00%
470	470	220	180	1700	390	220	248	367	40.00%
200	300	210	140	780	330	380	360	363	25.00%
900	290	210	68	144	330	90	148	320	40.00%
500	550	320	760	1080	380	28000	31000	648	55.00%

**James Street: 11/5/09**

On November 5<sup>th</sup>, a HW survey crew noticed a black stream and foul odor coming from a drainage pipe just upstream from the James Street Bridge over the Silvermine River. Water samples and photos were taken. The samples were processed by the Norwalk Public Health and the Harbor Watch water quality laboratory. Both tests confirmed the effluent was raw sewage. Subsequent investigation by the Norwalk Conservation Department and the WPCA showed that a large concrete pipe used as a bypass for a dam in the Silvermine River (just



above 7 James St) had been inadvertently crushed when a new septic tank was installed at this home in 2007. The entire septic system was removed and the bypass pipe was rerouted at the owner's expense.

Storm sewer discharge of raw sewage into the Silvermine River. The old concrete pipe is just 20' north of the James Street Bridge on the west bank of the Silvermine River. The sewage plume is clearly visible.

Oct-Apr 2009 *E. coli* bacteria results. Site SM3.1 is the James St pipe. Immediate remediation action was taken by the town. The observed low counts seen at SM3 from 1/7/09 on show that the problem was fixed.

	Dates									
Sites	10/22/2009	11/5/2009	12/3/2009	1/7/2010	3/4/2010	3/18/2010	4/8/2010	Geomean	%frequency over 576 colonies/100mLs	
NR23	72	4	2800	180	300	6	8	<b>58</b>	14.29%	
NR22	10		9000	5400	1400	8	900	<b>412</b>	66.67%	
NR21	12	44	800	500	56	740	42	<b>120</b>	28.57%	
NR20	24	4	2800	360	72	40	54	<b>76</b>	14.29%	
NR15	28	20	630	28	18	1	26	<b>24</b>	14.29%	
NR13	8	40	710	10	12	12	20	<b>25</b>	14.29%	
NR9.5	4	20	890	24	8	10	18	<b>22</b>	14.29%	
NR9	36	24	600	14	22	10	2	<b>23</b>	14.29%	
NR6	28	16	1300	20	40	20	24	<b>42</b>	14.29%	
NR4	32	20	2300	44	20	28	26	<b>51</b>	14.29%	
<b>SM3.1</b>	<b>1000</b>	<b>38000</b>								
SM3	52	1000	1400	30	20	32	36	<b>91</b>	28.57%	
NR1	92	40	3400	140	44	26	18	<b>86</b>	14.29%	
Rainfall (in.)	0.58	0.02	0.73	0.02	0.09	3.69*	0.00			
Days prior	4	4	0	6	1	4	7			



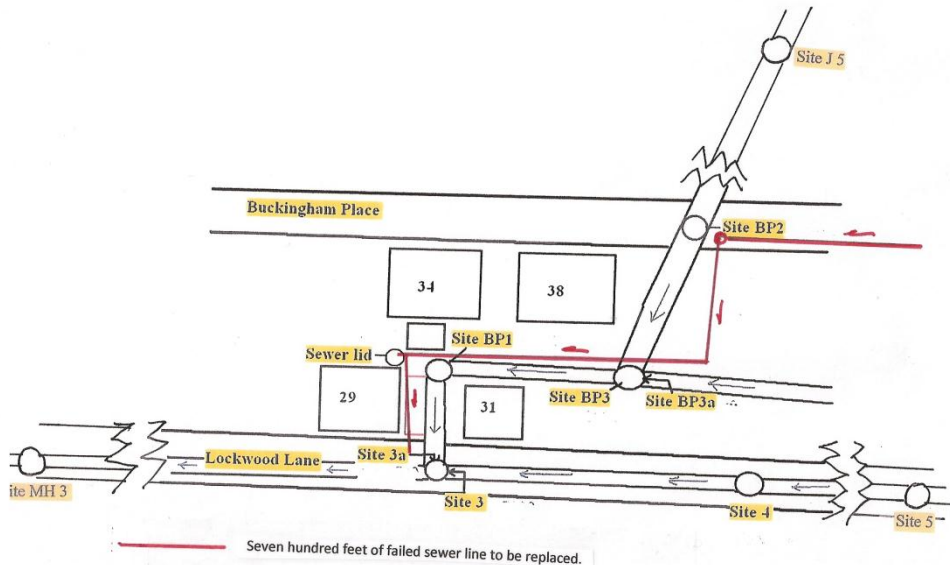
**Moody's Lane: 2/09 to 2/12**

After observing high *E. coli* bacteria counts in 2009 at a storm drainage pipe into the Norwalk River, HW began investigating the Moody's lane drainage system in an attempt to find illegal cross connections and/or sewage leaks in this 3 mile long system. The Moody's lane network of pipes drains a large residential neighborhood on the east shore of Norwalk Harbor south of the Post Road. The Moody's Lane drainage system also picks up some commercial properties on the Post Road to include Stew Leonard's grocery store and zoo. The most highly impaired section of the pipe based on many hundreds of HW bacteria tests appeared to be a section of pipe between Buckingham Place and Lockwood Lane. The location and a sketch of four suspected homes was given to the Norwalk Health and Public Works Departments.



Moody's Lane storm drain discharge before (Top) and after (Bottom) construction to replace the storm sewer line.

HW believed that one or more of these homes had an illegal cross connection to the storm drain. The issue was resolved when the Public Works Department decided to run a much larger drainage pipe (6ft.diameter) up Lockwood Ave. to relieve flooding conditions in the neighborhood where the pipe crosses between Lockwood and Buckingham. Once the contractor began excavation of the easement between the suspected houses, the source of the sewage infiltration to the storm drain was found to be a 70 year old sewage pipe that had failed and allowed sewage to enter the storm drain. Approximately 700 ft. of this sewer line is to be replaced which will go a long way in alleviating the input of pollution to Norwalk Harbor.



Sketch of the neighborhood between Lockwood Lane and Buckingham Place

**Calf Pasture Beach: 8/15/10**

On 8/15/10 HW investigated a bad odor at Calf Pasture Beach near the public fishing pier. HW subsequently discovered a very black tar like substance coming from the storm drain discharge. HW walked the length of the pipeline. An illegal cross connection was found in a manhole along the drainage line which was pulsating with the same black effluent. HW traced the pipe over to the concession stand run by Stew Leonard' s. Bacteria counts from tests conducted at the HW lab were grossly elevated and HW reported the situation to the city's Health and Public Works Departments. There was a period of indecision when the Parks and Recreation Department insisted that the problem was caused by a large flock of geese that lived on Calf Pasture Beach. HW called in Tim Bridges an EPA Chemist from Chelmsford, MA. to do pharmaceutical tests for such trace items as coffee, cigarettes, blood pressure meds and acetaminophen. Tests by Bridges confirmed suspicion that the effluent was not caused by geese alone and that human input was a major source of the bacteria. A smoke test was



Photos of the manhole outside of the Calf Pasture Beach concession stand. The green substance is the result of a dye test which proved that the concession stand was connected to the storm drain system and not the sewer (Above). After the smoke test showed that all drains in the concession stand we're connected to the storm drain system, they we're plugged to prevent any further leaking before the lines were rerouted (Right).



conducted by the WPCA which identified that all drain connections (with the exception of the ones in the bathroom) in the concession stand were connected directly to the illegal cross connection. With this information, the Public Works Department installed a 1000 tank for grease and rerouted the illegal lines to the sewer.

Observed Fecal Coliform levels in samples taken from the outflow pipe just to the right of the pier at Calf Pasture Beach from the first observed problems through the rerouting of the pipes.

Date	Fecal Coliform. CFU/100 mL	Amount of rain (in)	Days prior to sampling
8/17/2010	250000	0.47	1
8/18/2010	130000	0.47	2
8/19/2010	2000	0.47	3
8/21/2010	51000	0.47	5
9/14/2010	5800	0	7
9/18/2010	10000	0.79	2
10/1/2010	16600	3.66	0
10/4/2010	1800	3.66	3
10/15/2010	2800	1.50	0
10/18/2010	92	1.50	3
10/26/2010	300	0.00	7
10/29/2010	100	0.36	3
11/3/2010	480	0.00	7
11/4/2010	3300	0.85	0
11/11/2010	80	0.39	4
12/7/2010	4	1.13	6
12/14/2010	8	1.19	2
1/4/2011	0	0.00	7
2/15/2011	5	0.15	7
2/23/2011	2	0.00	7
3/1/2011	36	2.41	4*
3/15/2011	0	1.09	5*
3/29/2011	0	0.11	6

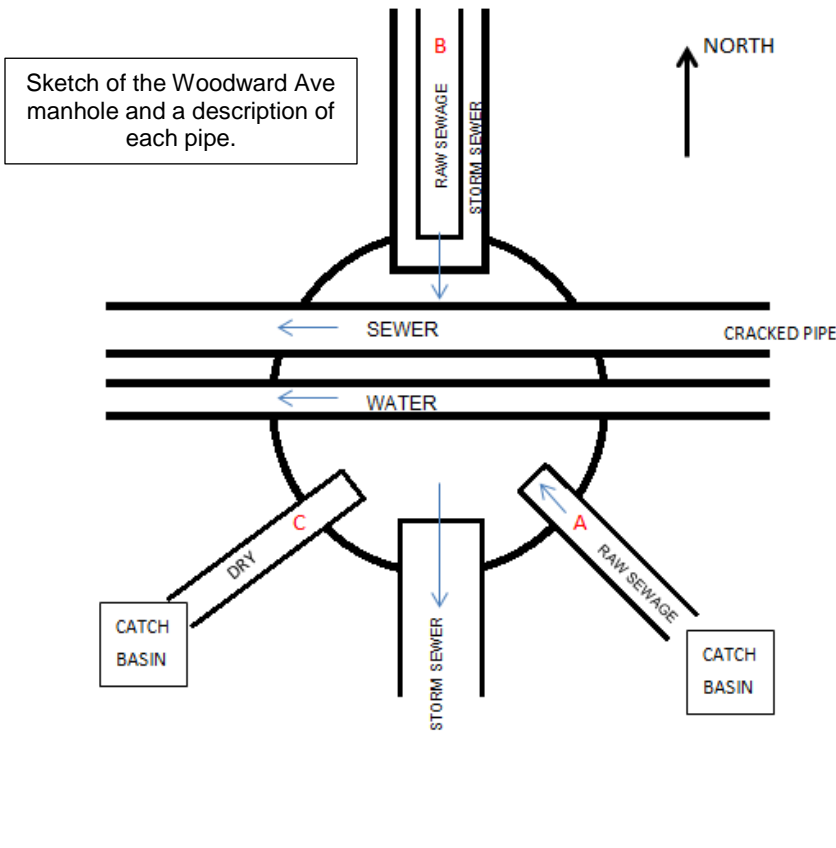


**Total Marine: 9/8/11**

HW was informed of a foul smell and an oily substance being discharged from the large 10' pipe at Total Marine on Water St in South Norwalk. After testing a water sample and observing bacteria counts in the hundreds of thousands, HW acquired maps of the storm drain system and began a manhole by manhole search for the pollution source. As input sources were eliminated, the search became a collaborative effort between HW, Norwalk Police, Public Works, Health (including the NPHL who ran many bacteria tests), Conservation Departments and Norwalk's WPCA. A manhole on Woodward Ave was found to have two pipes discharging raw sewage into the storm drain system. Data, photos, and observations were reported to all parties involved and the WPCA began an investigation. It was determined that one sewer pipe had collapsed under a rock which caused the pipe to overflow into the Woodward Ave manhole. Another pipe was broken and was also leaking sewage into the Woodward Ave manhole. PVC pipes were used to replace outdated cast iron pipes and the sewage infiltration was stopped.



Man hole on Woodward Ave where sewage observed to be dumping into the storm drain (Top). The Woodward Ave manhole after the broken and leaking pipes were replaced (Bottom).



Sketch of the Woodward Ave manhole and a description of each pipe.

Observed *E. coli* bacteria counts at the Woodward Ave manhole. A dramatic decrease in bacteria counts is seen after the pipe was replaced.

Site	Date	<i>E. coli</i> CFU/100 mLs
TM4	9/23/2011	500000
TM4	9/26/2011	1400000
TM4	9/28/2011	1600000
TM4	10/11/2011	2489000
TM4	11/1/2011	5200
TM4A	9/13/2011	TNTC
TM4A	9/23/2011	500000
TM4A	9/28/2011	20000
TM4A	10/4/2011	2419200
TM4A	10/11/2011	10462000
TM4B	9/23/2011	500000
TM4B	9/26/2011	1200000
TM4B	10/4/2011	2419200
TM4B	10/11/2011	8164000

**Branchville Brook: 11/9/11**

For the last two years the HW team has observed rising *E. coli* bacteria counts at site NR13 on

Map of the NR-13 system

the Norwalk River. This site is located at the south end of the Branchville Station parking lot. A team of high school students, led by a HW staff member, were given the mission of locating the cause of this rise in bacteria counts. After discovering a number of sites with low bacteria counts upstream from site NR13, the students began to research the tributaries. This change in research led the team to Branchville Brook entering the Norwalk River just above the north end of the Branchville Station parking lot. Here the students observed *E. coli* bacteria counts even higher than those observed at NR13. A Ridgefield Inland Wetlands Agent was informed of the results observed. The Inland Wetlands Agent and a Zoning Enforcement Officer made a site visit and spoke with the tenant of the house situated where the high counts were observed. He informed the agents that he often observed leakage from the home cesspool near the brook leaking into the brook during low water conditions. A memorandum was issued to the Ridgefield Health Director to work with the owner to eliminate this source of pollution to the Norwalk River.



*E. coli* geomeans for May-Sept 2011 on the Norwalk River. NR13 had observed levels three times higher than state limits which triggered further investigation.

Sites	Geomean
NR23	165
NR22	70
NR21	231
NR20	148
NR15	157
<b>NR13</b>	<b>376</b>
NR9.5	153
NR9	253
NR6	230
NR4	308
SM3	194
NR1	222

*E. coli* geomeans for Sept-Mar 2012. BR1 is just below the observed leaking cesspool.

Sites	Geomean
NR13.3	19
BR2	5
<b>BR1</b>	<b>470</b>
NR13.2	126
CB1	44
<b>NR13</b>	<b>106</b>



## Quick action by city of Norwalk improves harbor's water quality

The Hour January 6, 2012

To the Editor:

Harbor Watch, a volunteer, citizen's water quality monitoring program of Earthplace, The Nature Discovery Center, has as one of its missions the restoration of biological integrity to Long Island Sound and its watersheds. A focus point of its many activities is keeping a watchful eye on the numerous storm drains in Norwalk Harbor for signs of fecal pollution. This pollution can be the result of broken sewer lines or cross connections and the associated signs can appear quite suddenly as grey water in the storm drain's discharge to Norwalk Harbor.

Harbor Watch volunteers noticed a grey plume occurring at Total Marine in the discharge from a large drainage system that serves the area of south Norwalk. We reported the problem to Tom Closter, director of Environmental Services for the Norwalk Health Department. Tom accompanied us on a pipe-line survey on several occasions and helped us find a sewage leak into a storm water manhole on Woodward Avenue. Pete Lapak from Marine Police blocked traffic on streets in South Norwalk many times and helped us complete the survey in a timely fashion. We took many bacteria samples in the manholes on Woodward Avenue, which were shown to be raw sewage in our lab and were immediately confirmed as such by the Norwalk Public Health Lab with fast work by Pat DiPietro, lab technician. Meanwhile, Mike Yeosock P. E., senior engineer with Public Works, and Alexis Cherichetti, senior environmental officer for the Conservation Department provided detailed maps and the recent history of the Total Marine System.

Mike Yeosock and Tom Closter then sent the Harbor Watch data on the Woodward Avenue problem over to the Water Pollution Control Authority where Nick Berkun P.E. and Ralph Kolb, Waste Water Systems Manager, made the field investigation with the city contractor OMI and found two sections of sewer pipe damaged and leaking to the storm drain. The sections of pipe were replaced within the week and the bacteria counts quickly declined. The pollution problem was solved, thanks to a great team effort by above mentioned city departments and a spirit of cooperation among all the people involved. Harbor Watch will occasionally find some of the pollution problems by repetitive testing but only a quick response by the city departments such as occurred on Woodward Avenue can result in cleaner water for Norwalk Harbor.

The real thanks, however, does not only come from Harbor Watch, the shellfish industry has much to gain as well because all the shellfish grounds, some of which were closed for many weeks, were reopened shortly after the pipe on Woodward Avenue was repaired. The following companies wish to extend their thanks for a job well done by the city; Norman Bloom and Son Oysters and Clams, Hillard Bloom Shellfish Inc., Bloom Brothers, Pramer Oyster Company, AC Stabel Oyster Company and Bell Shellfish.

Dick Harris, Director

Earthplace Harbor Watch Program