REPORT: Model Separate Storm System Surveying & Monitoring

Berkshire Environmental Action Team (BEAT)






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Housatonic Valley Association (HVA)

City of Pittsfield

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I. Introduction: Water Quality in the Pittsfield section of the Housatonic River

In 2002 the Massachusetts Department of Environmental Protection (DEP) and the Division of Watershed Management prepared a summary of water quality data/information on the Housatonic Watershed. In the report, it was determined that the sections of the Housatonic River in Pittsfield—specifically the Southwest Branch, the West Branch, the East Branch, and the Main Stem—were "impaired" as they pertained to Surface Water Quality Standards (SWQS).

SWQS designate the most sensitive uses of Massachusetts waters and provide criteria for evaluating water quality to support those uses. The designated uses include: *Aquatic Life, Fish Consumption, Primary and Secondary Contact Recreation and Aesthetics.* There are a variety of reasons a waterway may be considered impaired ranging from pollution to surrounding land-use. In the case of the Housatonic River in Pittsfield, a number of factors were evaluated including but not limited to trash and debris, PCBs, elevated temperature, elevated total phosphorus, organic enrichment, and/or fecal coliform. Remarkably, all sections tested positive for elevated levels of fecal coliform.

Fecal coliform are bacteria that contribute to digestion, live in the intestines of warm blooded mammals, and indicate the presence of sewage. Obviously, sewage does not belong in the river.

But how did the fecal coliform get into the River? DEP and the Division of Watershed Management speculated that stormwater pipes were conveying it via illicit connections/hookups to sewage pipes. Old infrastructure, in this case old stormwater and sewage pipes, crisscross most cities in the United States. Far too often sewage makes its way into a stormwater pipes via belowground cracks and leaks. And fun fact, stormwater pipes lead to the river.

To address this, the Berkshire Environmental Action Team (BEAT), in partnership with the City of Pittsfield, the Housatonic Valley Association (HVA), Berkshire Community College (BCC), and Berkshire Regional Planning Commission (BRPC), applied for and received grant funding through the Massachusetts Environmental Trust (MET). The project was called the **Model Separate Storm System Surveying and Monitoring**. It required multiple organization to develop a BMP survey methodology, adapt the survey for a smartphone application, train volunteers to survey waterways, collect water samples, have a certified lab analyze the samples, and meet with stakeholders to discuss results and remediation.

Basically, volunteers would find, survey, and take samples from stormwater outfalls that were flowing during "dry weather" events. Surveying during "dry weather" is essential because during a rainstorm the outfalls are busy conveying that precipitation. However, after 72 hours of no rain, the pipes should be dry. Therefore, if volunteers were finding "dry weather flow" it begs the question, what is coming out of the pipes and where did it come from?

II. Methodology

a. Survey Conditions

Based on best management practice in regards to surveying stormwater outfalls for dry weather flow, it was decided that “dry weather” would be considered 72 hours of less than or equal to one tenth of an inch of rain. As stormwater outfalls are designed specifically to convey rainwater to waterbodies, if surveyors found discharge at stormwater outfalls during dry weather conditions then it begs the question, what is it?

b. Digital Survey Form

Deciding what data are necessary is the first step toward creating a digital survey form. To do so, BEAT asked the City of Pittsfield and Berkshire Regional Planning Commission what data would be most useful. After reviewing similar projects for best management practices we decided upon 16 data fields. Those fields were Unique ID, Latitude, Longitude, Flow, Material, Condition, Color of Flow, Smell of Outfall, Turbidity, Floatables, Vegetation Type, Animal or Fish Presence, Description, and the City of Pittsfield Outfall ID.

Using those fields BEAT modified an ArcCollector application for use on both Android and IPhone devices. To do so, BEAT created a file geodatabase in ArcMap, created domains based on those 16 fields, added a featureclass, added the correct field types, and published a feature service to our organization. Fortunately, ESRI has a step by step guide that will walk you through the process of creating your own modified ArcCollector App. That guide can be found here: http://doc.arcgis.com/en/collector/windows/create-maps/prepare-data-desktop.htm and here: http://doc.arcgis.com/en/collector/windows/create-maps/create-and-share-a-collector-map.htm.

Additionally, BEAT added the City of Pittsfield’s stormwater system GIS layer to the basemap of the digital survey form. Surveyors used that basemap as a reference when looking for outfalls.

Please note, you must have an ArcOnline subscription in order to create a digital survey form using this methodology.

c. QAPP

Concurrent with the start of the project, BEAT’s partner, the Housatonic Valley Association (HVA), began updating an old Quality Assurance Project Plan or QAPP. A QAPP is like a blueprint for how a project will run. In this case, the state required a QAPP for the phase of the project that involved the collection of dry weather flow and lab testing. Fortunately, HVA had done a similar project in the past so they were able to simply update an old QAPP.

This was an essential step because without a QAPP the Commonwealth would not have considered the sampling data.

d. Survey Outfalls

By far the most time consuming phase of this project was surveying the 17.75 miles of the Housatonic River for stormwater outfalls. BEAT staff and volunteers used kayaks and chest waders to negotiate the waters and only did so when the current of the river was manageable and safe.

Equipment included kayak, waders, personal floatation device, a meter stick, a backup camera, and a smartphone. The smartphone had previously downloaded the ArcCollector app.

e. Collect and Test Samples

Based on the results of surveying, volunteers were trained under the QAPP, collected samples, and transported samples to the certified lab.

BEAT had funding enough to survey nine outfalls however surveyors found 43 with dry weather flow. To pick which nine would be sampled and tested, BEAT looked for indicators of fecal coliform contamination such as the odor of sewage and beige colored colonies of fungus.

Under the QAPP, volunteers collected 100ml of discharge from each of the nine outfalls as well as one duplicate sample and one 100ml of distilled water. Those samples were brought to Premier Laboratory in Lee, MA no later than 6 hours after the first sample had been collected.

III. Summary of Findings

a. West Branch

Range: Pontoosuc Lake to Confluence
Distance: 4.89mi
Land Use: Primarily Urban
Outfalls: 169
Dry Weather Flow Outfalls: 26

Overview: The West Branch of the Housatonic River begins at the Pontoosuc Lake dam. It winds through mostly urban, semi urban, and industrial surroundings before connecting with the Southwest Branch near the southern end of Clapp Park. Finally, it reaches the confluence with the East Branch at the southern point of Fred Garner Park.

The West Branch is the most developed section of river in Pittsfield nevertheless it boasts several short sections with ample aquatic and terrestrial habitat, especially behind Wahconah Park. Moreover, the West Branch runs through Pittsfield's Minority and Income Environmental Justice Area. Perennially, BEAT and HVA run trash cleanups on this branch of the river.

The West Branch is considered impaired under SWSQ *Aquatic Life Uses, Primary Contact Recreation Use Assessments, Secondary Contact Recreation Use, and Aesthetics Use*. Fecal coliform was a consideration for the *Secondary Contact Recreation Use* impairment.

The West Branch is considered a Class B water and as such designated habitat for fish, other aquatic life, and wildlife and for primary and secondary contact recreation. Under certain conditions and treatment water may be a suitable source of public water supply. It is also suitable for irrigation and agricultural uses and compatible industrial cooling processes.

The West Branch, as a Class B water and in relation to fecal coliform, as defined by the Massachusetts Department of Public Health, in 105 CMR 445.010: the geometric mean of all E. coli samples taken within the most recent six months shall not exceed 126 colonies per 100 ml typically based on a minimum of five samples and no single sample shall exceed 235 colonies per 100ml.

Volunteers found more dry weather flows on this branch of the river than any other (169). Of the 26 outfalls conveying dry weather flow 7 were sampled.

The first outfall sampled, identified as WB100, is located between Hancock Road bridge and the Pontoosuc Lake dam. Throughout the sampling and survey season, this outfall maintained a what volunteers described as a "high" rate of flow. However, there was never any odor or curious bacterial growth. In the end, BEAT decided to sample this outfall due to the quantity of discharge regularly reported.

WB100 was tested on five occasions, in each instance levels of fecal coliform were very low to non-existent. The high rate of flow may be a result of a drainage from the eastern hillsides or a small stream connected to the

system. Cross referencing state hydrology layers and city stormwater system layers in a GIS system did not produce any potential stream stormwater connections. Whatever is flowing into the river, it is not contributing to fecal coliform contamination.

State reg	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
235	1	1	10.9	7.5	14.5

The second outfall, identified as WB 260, is located along the riverside of Route 7/North Street between Hancock Road and Wyandotte Business Park just downslope of a bike lane sign. Volunteers described the rate of flow as “moderate” and the odor as “musky” and/or “sewage”. BEAT decided to sample this outfall because there was a fair amount of flow, volunteers detected the odor of sewage, and the fact that there is a sewage line that runs past this outfall.

WB 260 was tested on five occasions, three times it did not test positive for fecal coliform, on two occasions it tested 32.9 most probable number (MPN)/100ml and 52.9 MPN/100ml respectively. Both of those numbers are still well below state imposed limits and as such BEAT did not consider this a priority for remediation. That being said, students from Berkshire Community College (BCC) will be monitoring this outfall via their own fecal coliform tests as a part of a microbiology class.

State reg	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
235	1	52.9	32.9	1	0

The third outfall, identified as WB410, is located at the southernmost end of Wyandotte Business Park, behind an old fence and the southernmost brick building. Volunteers described the rate of flow as “moderate”, the odor as “sewage”, and the condition as “minor damage”. What’s more, there is a sewer line running past the outfall. Also, this outfall did not appear on the City of Pittsfield’s Storm Water System map or GIS layer. Due to these characteristics, BEAT decided to sample this outfall.

WB410 was tested on five occasions by a certified lab and one time by students from BCC’s microbiology lab. Results obtained both sources indicate that there is a serious contamination issue. Lab results were 1732.9 MPN/100ml, 2419.6 MPN//100ml, >2419.6 MPN/100ml, >2419.6 MPN/100ml, and 648.5 MPN/100ml. The geometric mean for these five samples is BCC students were not able to obtain a result via plating and counting colony forming unit due to the extreme concentration of fecal coliform.

In relationship to state regulations, this outfall tested well outside the individual 235 cfu/100ml limit for all five samples. Moreover, it’s geometric mean of 1739.3 is well above the 126 cfu/100ml permitted.

State reg	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
235	1732.9	2419.6	>2419.6	>2419.6	648.5

BEAT is pressuring the City to remediate this situation. BCC students will continue to sample and test this outfall.

The fourth outfall, identified as WB 1440, is located west of Clocktower Business Park, behind the start of a barbed wire fence along the parking lot. Volunteers described the rate of flow as “moderate” and the odor as “sewage”. Additionally, some of the water beneath the outfall had a cloudy appearance that usually indicates some level of fecal coliform contamination.

WB1440 was tested on five occasions, only one of those samples tested above the state limit and it is worth mentioning that it tested well above the state limit. Also, the geometric mean of five samples was 20.3 which is well below the state limit of 126.

State reg	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
235	10.8	2	17.5	9.8	920.8

Despite the one sample that tested above the state limit BEAT does not consider this outfall a priority for remediation. We will have students from BCC monitor the outfall for fecal coliform and follow up if results indicate a consistent source of contamination.

The fifth outfall, identified as WB1450, is located behind parking lot for the “Hot Dog Ranch” and “Oasis Hair Design” off of Route 20/West Rd. Volunteers described the rate of flow as “minor”, the odor as either “none” or “sewage”, and noted the presence of a “beige colored colony of fungus or vegetation” which can be an indicator of fecal coliform.

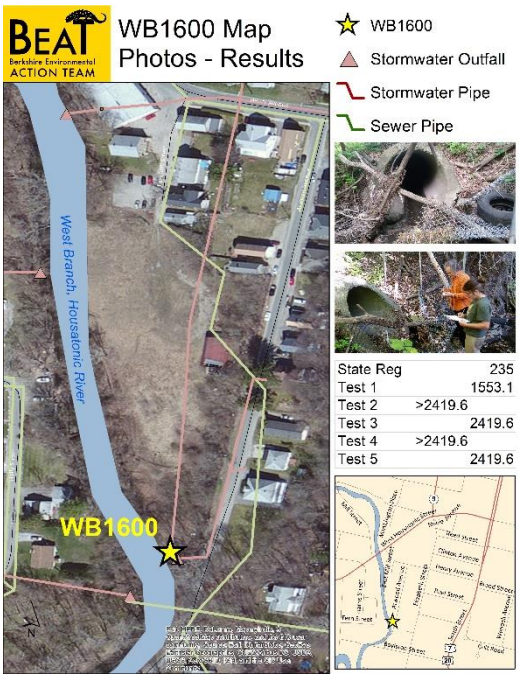
WB1450 was tested on five occasions, on one occasion the sample well exceeded state limits. Additionally, the geometric mean of the five samples is 177.3 which is slightly higher than the state limit of 126.

State reg	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
235	178	1732.9	107.1	81.6	65

Despite the geometric mean and the one sample both being above state limits, BEAT does not consider this outfall a priority for remediation. We will have students from BCC monitor the outfall for fecal coliform and follow up if results indicate a consistent source of contamination.

The sixth outfall, identified as WB1600, is located along Atwood Drive in a forested section of the river between residential areas. Volunteers described the rate of flow as “minor” and the odor as “sewage”. Also, there are a considerable number of locations where sewage lines cross the stormwater pipe.

WB1600 was tested on five occasions by a certified lab and four times by BCC’s microbiology lab. Results obtained by both sources indicate a serious contamination issue. All five of the lab samples tested significantly higher than the state limits and the geometric mean of the five samples was 2214.3, well above the state limit 126.



State reg	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
235	1553.1	>2419.6	2419.6	>2419.6	2419.6

BCC students were not able to obtain a result via plating and counting colony forming units due to the extreme concentration of fecal coliform in the sample. Professors actually tried diluting samples in order to obtain a result but samples were still too concentrated. These experiences caused one of the BCC professors to query whether or not the discharge may actually be “raw sewage”.

BEAT considers this outfall to be a priority for remediation. BEAT is pressuring the City to remediate this situation. BCC students will continue to sample and test this outfall.

The seventh outfall, identified as WB330, is located in the Wyandotte Business Park, 50 yards downriver of the Keeler St bridge alongside the northernmost side of the nearest brick building. Volunteers described the rate of flow as “minor” and the odor as “musky” or “none”. Also, this outfall did not appear on the City of Pittsfield’s Storm Water System map or GIS layer.

WB330 was tested on five occasions by a certified lab. Of those five samples, none tested above individual sample state limits nor the state limit for geometric mean of five samples.

State reg	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
235	5.2	30.5	214.3	9.6	2

This is not considered a priority for remediation by BEAT.

b. East Branch

Range: Hubbard Ave and Rte 8 Bridge to the Confluence
Distance: 5.12 mi
Land Use: Urban, Industrial and Forested
Outfalls: 71
Dry Weather Flow Outfalls: 12

Overview: The East Branch of the Housatonic River begins at the outlet of Center Pond in Dalton. However, for the sake of this project, surveying began at the Hubbard Ave bridge adjacent to Route 8. This section of river winds through a combination of urban, industrial and forest before reaching the confluence with the West Branch at the southern point of Fred Garner Park.

The East Branch is the most forested branch of the Housatonic in Pittsfield. However, it is also considered a hazardous waste site because of severe PCB contamination.

The East Branch is considered a Class B water and as such designated habitat for fish, other aquatic life, and wildlife and for primary and secondary contact recreation. Under certain conditions and treatment water may be a suitable source of public water supply. It is also suitable for irrigation and agricultural uses and compatible industrial cooling processes.

The East Branch, as a Class B water and in relation to fecal coliform, as defined by the Massachusetts Department of Public Health, in 105 CMR 445.010: the geometric mean of all E. coli samples taken within the most recent six months shall not exceed 126 colonies per 100 ml typically based on a minimum of five samples and no single sample shall exceed 235 colonies per 100ml.

The East Branch is considered impaired under SWSQ *Fish Consumption and Primary Contact Recreation Use Assessments.* Fecal coliform was a consideration for the *Primary Contact Recreation Use* impairment.

Volunteers found 71 outfalls on this section of river. Of the 12 outfalls conveying dry weather flow 2 were sampled.

The first outfall sampled, identified as EB135, is located at a bend in the branch between route 8 and the Barnes and Noble parking lot. Volunteers described the rate of flow as “moderate” and did not detect any odor. However, there are several locations where the stormwater pipes and the sewer pipes cross one another.

EB135 was tested on five occasions by a certified lab, of those five samples one tested well above the state limit of 235 cfu/100ml. That being said, the geometric mean of the five samples is 91.6 which is below the state limit of 126.

State reg	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5

235	33.1	1553.1	50.4	70.3	35.5

Despite one sample that tested well above the single sample limit of 235, this is not considered a priority for remediation by BEAT.

The second outfall samples, identified as EB190, is located southwest of Torrco Plumbing Supply on Commercial Street. Volunteers described the rate of flow as “minor” and the odor as “gasoline” or “none”. There are several locations where the stormwater pipes and the sewer pipes cross one another. Also, this outfall did not appear on the City of Pittsfield’s Storm Water System map or GIS layer.

EB190 was sampled on five occasions by a certified lab, of those samples one tested slightly above state limits.

State reg	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
235	261.3	214.3	222.4	5.2	1

Despite one sample that tested well above the single sample limit of 235, this is not considered a priority for remediation by BEAT.

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c. Southwest Branch

Range: Richmond Pond Outfall to West Branch Confluence
Distance: 3.23 mi
Land Use: Residential and Forested
Outfalls: 33
Dry Weather Flow Outfalls: 2

Overview: The Southwest Branch of the Housatonic River begins at the outlet of Richmond Pond in Pittsfield. However, for the sake of this project, surveying began at Hungerford St bridge adjacent to Lebanon Ave. This section of river winds through a combination of residential areas and forest before reaching the confluence with the West Branch behind Clapp Park.

The Southwest Branch is considered a Class B water and as such designated habitat for fish, other aquatic life, and wildlife and for primary and secondary contact recreation. Under certain conditions and treatment water may be a suitable source of public water supply. It is also suitable for irrigation and agricultural uses and compatible industrial cooling processes.

As a Class B water and in relation to fecal coliform, as defined by the Massachusetts Department of Public Health, in 105 CMR 445.010: the geometric mean of all E. coli samples taken within the most recent six months shall not exceed 126 colonies per 100 ml typically based on a minimum of five samples and no single sample shall exceed 235 colonies per 100ml.

The East Branch is considered impaired under SWSQ *Fish Consumption and Primary Contact Recreation Use Assessments.* Fecal coliform was a consideration for the *Primary Contact Recreation Use* impairment.

Volunteers found 33 outfalls on this section of river. Of the 2 outfalls conveying dry weather flow none were sampled. It is thought that both outfalls are actually culverts and are conveying water from wetlands or streams.

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d. Main Stem

Range: Confluence of the branches to the town border with Lenox
Distance: 4.51 mi
Land Use: Forested
Outfalls: 12
Dry Weather Flow Outfalls: 0

Overview: The Main Stem of the Housatonic River begins at the confluence of the West Branch and the East Branch in Pittsfield. The Main Stem winds through forested surroundings and an occasional residential area. For the sake of this grant, BEAT surveyed all stormwater outfalls to the town border with Lenox, MA.

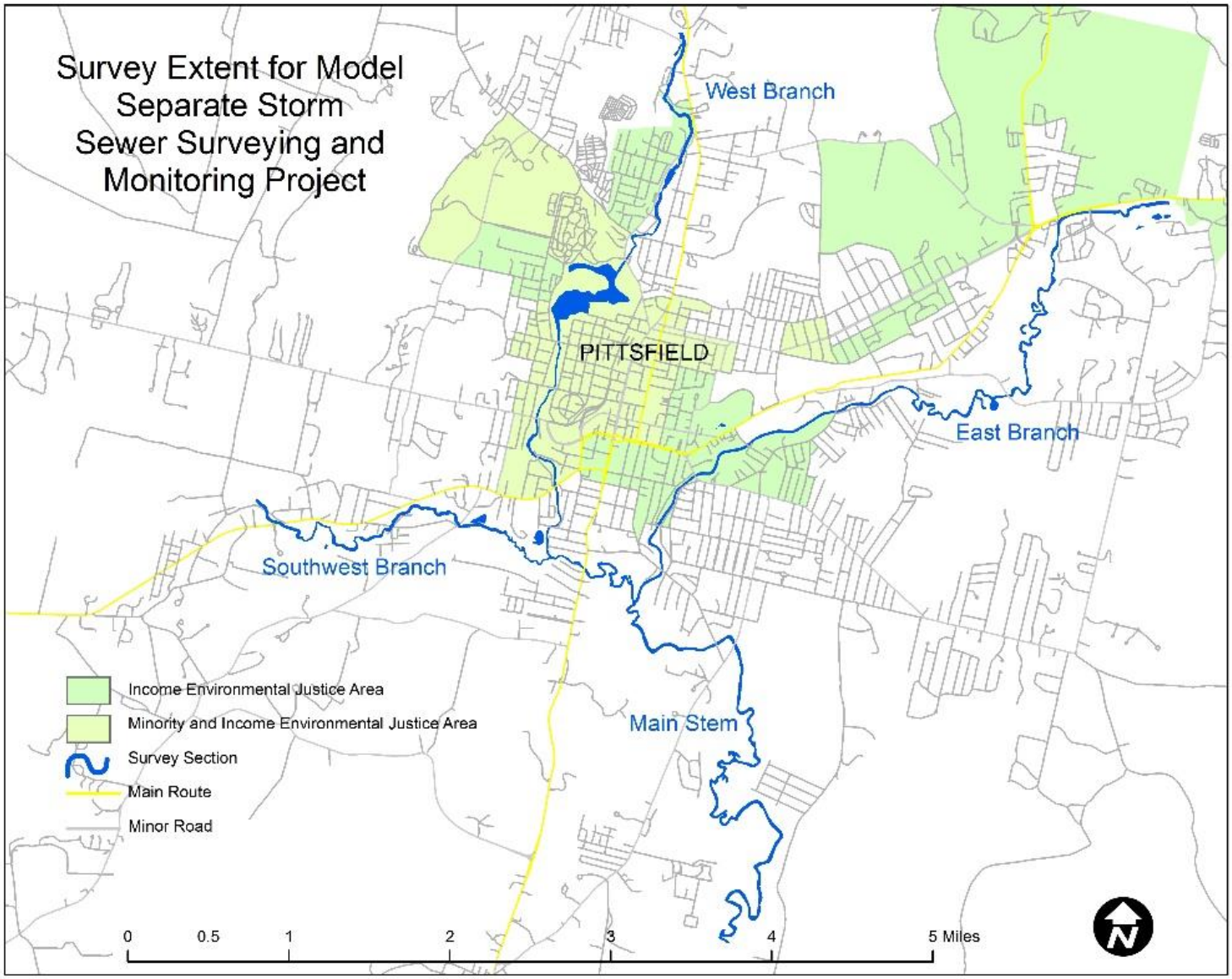
The Main Stem is considered a Class B water and as such designated habitat for fish, other aquatic life, and wildlife and for primary and secondary contact recreation. Under certain conditions and treatment water may be a suitable source of public water supply. It is also suitable for irrigation and agricultural uses and compatible industrial cooling processes.

As a Class B water and in relation to fecal coliform, as defined by the Massachusetts Department of Public Health, in 105 CMR 445.010: the geometric mean of all E. coli samples taken within the most recent six months shall not exceed 126 colonies per 100 ml typically based on a minimum of five samples and no single sample shall exceed 235 colonies per 100ml.

The Main Stem is considered impaired under SWSQ *Aquatic Life Use Assessment, Fish Consumption Use Assessment, and Primary Contact Recreation Use Assessments.* Fecal coliform was a consideration for the *Primary Contact Recreation Use* impairment.

Volunteers found 12 outfalls on this section of river. None of the outfalls were found conveying dry weather flow.

IV. Maps


Survey Extent for Model Separate Storm Sewer Surveying and Monitoring Project
West Branch
PITTSFIELD
East Branch
Southwest Branch
Main Stem
Income Environmental Justice Area
Minority and Income Environmental Justice Area
Survey Section
Main Route
Minor Road
0
0.5
1
2
3
4
5 Miles
N

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WB1600 Map Photos - Results

WB1600

Stormwater Outfall

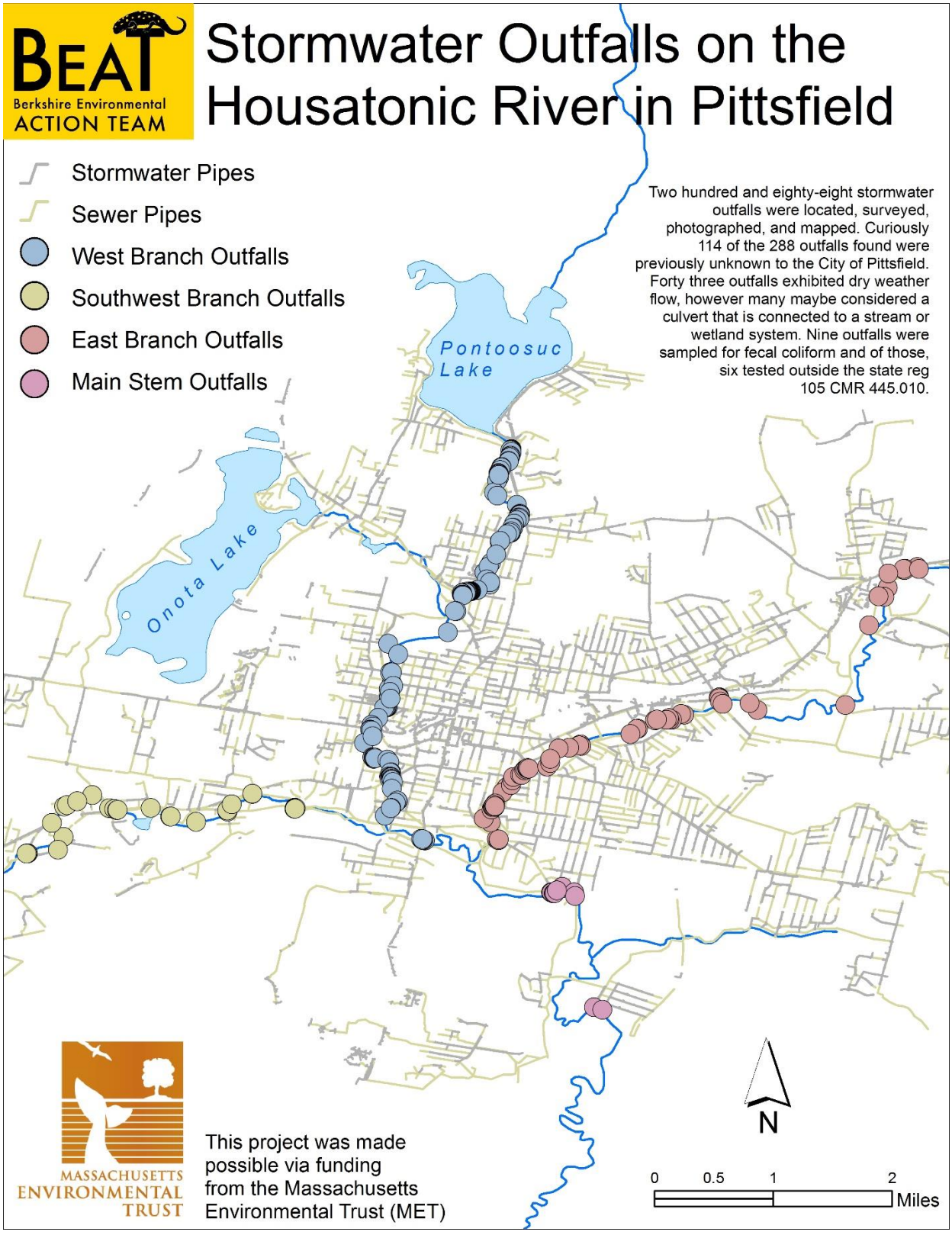
Stormwater Pipe

Sewer Pipe

State Reg	235
Test 1	1553.1
Test 2	>2419.6
Test 3	2419.6
Test 4	>2419.6
Test 5	2419.6

Stormwater Outfalls on the Housatonic River in Pittsfield

BEAT
Berkshire Environmental
ACTION TEAM



Two hundred and eighty-eight stormwater outfalls were located, surveyed, photographed, and mapped. Curiously 114 of the 288 outfalls found were previously unknown to the City of Pittsfield. Forty three outfalls exhibited dry weather flow, however many maybe considered a culvert that is connected to a stream or wetland system. Nine outfalls were sampled for fecal coliform and of those, six tested outside the state reg 105 CMR 445.010.

MASSACHUSETTS ENVIRONMENTAL TRUST

This project was made possible via funding from the Massachusetts Environmental Trust (MET)

V. Table of Results

EB095	42.469405	-73.19650	minor	12	concrete	undamaged	clear	sewage	clear	none	sewage_fu	fish	south east	156
EB100	42.469655	-73.19670	none	12	metal	undamaged	no flow	none	no flow	none	none	none	near bridge	197
EB110	42.469440	-73.19820	none	30	metal	undamaged	no flow	none	no flow	none	none	none		NA
EB120	42.469282	-73.19827	none	36	metal	undamaged	no flow	none	no flow	none	none	none	appears to	NA
EB130	42.469399	-73.19838	none	12	metal	minor_dam	no flow	none	no flow	none	none	dead deer r	deer proba	NA
EB135	42.468862	-73.20025	moderate	18	metal	undamaged	clear	none	clear	none	excessive	fish	at bend in r	253
EB140	42.467151	-73.20032	none	30	metal	minor_dam	no flow	no flow	no flow	none	none	none	oil in outflo	NA
EB150	42.466012	-73.20070	none	26	concrete	minor_dam	no flow	no flow	no flow	none	none	none	standing w	NA
EB160	42.466078	-73.20142	none	39	concrete	minor_dam	no flow	no flow	no flow	none	none	none	standing w	27
EB170	42.462558	-73.20258	none	12	metal	other	no flow	no flow	no flow	none	none	none	standing w	NA
EB180	42.452850	-73.20546	none	12	metal	minor_dam	no flow	none	clear	none	none	fish	just upstrea	NA
EB190	42.452226	-73.21617	minor	14	metal	moderate_	clear	none	clear	none	none	deer and fi	orange sed	NA
EB200	42.453078	-73.21715	moderate	36	metal	major_dam	clear	musty	clear	none	none	fish	bottom cor	122
EB310	42.453784	-73.22084	moderate	42	concrete	minor_dam	clear	musty	clear	none	none		one of two	149
EB320	42.453729	-73.22088	minor	42	concrete	minor_dam	clear	musty	clear	none	none		one of two	148
EB330	42.453754	-73.22090	none	12	concrete	minor_dam	no flow	none	clear	none	none		next to two	0
EB340	42.453651	-73.22085	none	12	metal	moderate_	no flow	none	no flow	none	none		next two th	150
EB350	42.453252	-73.22073	none	4	other	major_dam	no flow	none	clear	none	none		2 PVC pipes	NA
EB360	42.452987	-73.22043	none	12	concrete	minor_dam	no flow	none	clear	none	none		in thicket	232
EB370	42.451672	-73.22512	none	12	other	undamaged	no flow	none	clear	none	none	none	PVC plastic	103
EB380	42.451766	-73.22550	none	12	metal	minor_dam	no flow	none	clear	none	none	ducks	on concrete	245
EB390	42.451059	-73.22661	none	10	metal	moderate_	no flow	none	clear	none	none	heron, fish		109
EB400	42.451057	-73.22690	none	14	metal	minor_dam	no flow	none	clear	none	none	heron, fish		108
EB410	42.451247	-73.22697	none	30	concrete	minor_dam	no flow	none	clear	none	none	fish		107
EB420	42.451043	-73.22724	none	6	metal	minor_dam	no flow	none	clear	none	none	fish		NA
EB430	42.450969	-73.22868	none	14	metal	minor_dam	no flow	none	clear	none	none	fish		367
EB440	42.451069	-73.22842	none	14	metal	undamaged	no flow	none	clear	none	none	fish		368
EB450	42.449968	-73.23074	none	30	metal	minor_dam	no flow	none	clear	none	none	raccoon		0
EB460	42.449922	-73.23093	heavy	10	metal	undamaged	clear	none	clear	none	excessive	ducks		89
EB470	42.449323	-73.23165	none	30	concrete	minor_dam	no flow	none	clear	none	none			154
EB480	42.448070	-73.23773	none	6	other	undamaged	no flow	none	clear	none	none	fish	plastic	NA
EB490	42.447986	-73.23786	none	8	metal	moderate_	no flow	none	clear	none	none	heron, fish		43
EB500	42.447846	-73.23769	none	16	metal	undamaged	no flow	none	clear	none	none	fish		44
EB510	42.447934	-73.23790	none	16	other	undamaged	no flow	none	clear	none	none	fish	plastic	NA
EB520	42.447652	-73.23914	none	10	other	undamaged	no flow	none	clear	none	none	fish	plastic	NA
EB530	42.447571	-73.24041	none	198	concrete	undamaged	heavy flow	musty	clear	none	none		big box cul	177
EB540	42.446310	-73.24145	none	12	metal	undamaged	no flow	none	none	none	none			3
EB550	42.445797	-73.24143	none	16	metal	undamaged	no flow	none	none	none	none			59
EB560	42.445356	-73.24180	none	42	concrete	undamaged	no flow	none	none	none	none	fish		58
EB570	42.445107	-73.24404	none	12	metal	minor_dam	no flow	none	clear	none	none			NA
EB580	42.445174	-73.24419	none	36	metal	moderate_	no flow	none	clear	none	none			35
EB590	42.445161	-73.24422	minor	12	metal	minor_dam	clear	none	clear	none	none			34
EB600	42.445136	-73.24425	minor	36	concrete	minor_dam	clear	sewage	clear	none	sewage_fu		funny gravi	NA
EB610	42.445048	-73.24441	none	48	concrete	undamaged	no flow	none	clear	none	none		next to a b	NA
EB620	42.444911	-73.24461	none	24	metal	minor_dam	no flow	none	clear	none	none		at end of cl	NA
EB630	42.444333	-73.24493	none	12	other	undamaged	no flow	none	clear	none	none		plastic	NA
EB640	42.444367	-73.24511	none	18	metal	minor_dam	no flow	none	clear	none	none		attached to	129
EB650	42.444079	-73.24595	none	24	metal	moderate_	no flow	none	clear	none	none		near rd, M	166
EB660	42.443696	-73.24605	none	24	other	undamaged	no flow	none	clear	none	none		plastic	NA
EB670	42.443101	-73.24624	none	18	other	undamaged	no flow	none	clear	none	none		plastic	120
EB674	42.442845	-73.24675	minor	12	plastic	undamaged	clear	none	clear	none	none		NO MATCH	279
EB675	42.442181	-73.24727	minor	12	other	undamaged	clear	none	clear	none	none		VCP	278
EB676	42.440879	-73.24817	none	6	plastic	undamaged	no flow	none	clear	none	none		NO MATCH	340
EB680	42.440654	-73.24826	none	12	metal	moderate_	no flow	none	clear	none	none		under bride	NA
EB690	42.440628	-73.24829	none	6	metal	moderate_	no flow	none	clear	none	none		under bride	NA
EB700	42.440594	-73.24815	none	12	metal	moderate_	no flow	none	clear	none	none		under bride	NA
EB710	42.440442	-73.24843	none	6	metal	minor_dam	no flow	none	clear	none	none		under bride	NA
EB720	42.440576	-73.24835	none	6	metal	moderate_	no flow	none	clear	none	none		under bride	NA
EB730	42.440516	-73.24839	none	6	metal	moderate_	no flow	none	clear	none	none		under bride	NA
EB740	42.440598	-73.24830	none	6	metal	moderate_	no flow	none	clear	none	none		under bride	NA
EB750	42.440532	-73.24818	none	6	metal	moderate_	no flow	none	clear	none	none		under bride	NA
EB760	42.440424	-73.24822	none	30	metal	moderate_	no flow	none	clear	none	none		under retai	42
EB770	42.440424	-73.24822	none	6	metal	moderate_	no flow	none	clear	none	none		under bride	NA
EB780	42.440495	-73.24820	none	6	metal	moderate_	no flow	none	clear	none	none		under bride	NA
EB790	42.440422	-73.24848	none	15	metal	moderate_	no flow	none	clear	none	none	fish	built into r	175
EB800	42.440134	-73.24861	none	30	other	undamaged	no flow	musty	clear	none	none	fish	plastic mat	65
EB810	42.439052	-73.24953	none	24	concrete	minor_dam	no flow	none	clear	none	none	fish	at bend in t	170
EB820	42.438556	-73.24869	none	12	other	undamaged	no flow	none	clear	none	none	minnows	plastic	210
EB830	42.436505	-73.24772	minor	30	concrete	undamaged	clear	sewage	clear	none	sewage_fu	minnows	directly un	162
EB840	42.436385	-73.24775	none	10	other	moderate_	no flow	none	clear	none	none	minnows	VCP, attach	164
EB850	42.436510	-73.24796	none	12	concrete	minor_dam	no flow	none	clear	none	none		just downst	163
MS100	42.430031	-73.24133	none	4	metal	minor_dam	no flow	none	clear	none	none	fish	under bride	NA
MS110	42.430006	-73.24125	none	4	metal	minor_dam	no flow	none	clear	none	none	fish	under bride	NA
MS130	42.429973	-73.24092	none	4	metal	minor_dam	no flow	none	no flow	none	none	fish	under bride	NA
MS140	42.429906	-73.24102	none	4	metal	minor_dam	no flow	none	clear	none	none	fish	under bride	NA
MS150	42.429943	-73.24093	none	4	metal	minor_dam	no flow	none	clear	none	none	fish	under bride	NA
MS160	42.429956	-73.24088	none	4	metal	minor_dam	no flow	none	clear	none	none	fish	under bride	NA
MS180	42.430276	-73.24063	none	16	concrete	minor_dam	no flow	none	clear	none	none	fish		286
MS190	42.430524	-73.24009	none	14	concrete	major_dam	no flow	none	clear	none	none	fish	collapsed	NA
MS200	42.430717	-73.23997	minor	24	metal	moderate_	clear	none	clear	none	none	fish	behind dog	233
MS210	42.430047	-73.23851	moderate	24	concrete	minor_dam	clear	none	clear	none	none	fish	behind fen	188
MS230	42.429602	-73.23842	none	4	other	major_dam	no flow	none	clear	none	none	fish	plastic	NA
MS240	42.415994	-73.23618	none	16	concrete	minor_dam	no flow	none	clear	none	none	fish		2
SW100	42.434774	-73.30525	none	4	concrete	undamaged	no flow	none	no flow	none	none	mink	under bride	NA
SW110	42.434793	-73.30516	none	12	metal	undamaged	no flow	none	no flow	none	none	none	under bride	127
SW120	42.434776	-73.30520	none	4	concrete	undamaged	no flow	none	no flow	none	none	none	under bride	NA
SW130	42.434794	-73.30523	none	4	concrete	undamaged	no flow	none	no flow	none	none	none	under bride	NA
SW140	42.434781	-73.30510	none	4	concrete	undamaged	no flow	none	no flow	none	none	none	under bride	NA
SW145	42.435224	-73.30142	heavy	36	metal	undamage	clear	none	clear	none	none	fish	probably a	193
SW146	42.436802	-73.30074	none	18	metal	minor_dam	no flow	none	none	none	none	beavers, wa	under dens	206
SW150	42.438483	-73.30219	none	2	concrete	undamaged	no flow	sulfide	no flow	none	none	fish and be	under bride	NA
SW160	42.440509	-73.30068	none	18	concrete	undamaged	no flow	none	no flow	none	none	beaver		117
SW170	42.440681	-73.30036	none	9	other	major_dam	no flow	none	no flow	none	none	none	VCP, broke	NA
SW180	42.441134	-73.29908	none	8	metal	minor_dam	no flow	none	no flow	none	none	beaver	next to bric	NA
SW185	42.441886	-73.29725	heavy	48	concrete	undamaged	clear	none	none	none	none	none	MATERIAL	186
SW186	42.440286	-73.29517	none	12	metal	minor_dam	no flow	none	none	none	none	none	behind buil	160
SW190	42.440186	-73.29458	none	24	concrete	undamaged	no flow	none	no flow	none	none	none		NA
SW200	42.440067	-73.29423	none	12	concrete	undamaged	no flow	none	no flow	none	none	none	next to bric	304
SW210	42.440081	-73.29416	none	12	concrete	major_dam	no flow	none	no flow	none	none	none	next to bric	NA

SW215	42.440341	-73.290147	none	18	metal	nimor_dam	no flow	none	no flow	none	none	fish		184
SW220	42.439291	-73.287777	none	12	metal	major_dam	no flow	none	no flow	none	none	none	really bad s	NA
SW230	42.439291	-73.287696	none	3	metal	major_dam	no flow	none	no flow	none	none	fish and be	really bad s	NA
SW240	42.438629	-73.284601	none	12	other	undamage	no flow	none	no flow	none	none	none	plastic mat	NA
SW250	42.439921	-73.280810	none	6.5	metal	undamage	no flow	none	no flow	none	none	fish	sticking ou	NA
SW260	42.439953	-73.280810	none	24	other	undamage	no flow	none	no flow	none	none	fish	plastic mat	NA
SW270	42.439994	-73.280766	none	5	concrete	undamage	no flow	none	no flow	none	none	fish	part of brid	NA
SW280	42.439877	-73.280763	none	12	metal	undamage	no flow	none	no flow	none	none	fish	part of brid	294
SW290	42.440007	-73.280800	none	12	other	undamage	no flow	none	no flow	none	none	fish	ACP, part (	252
SW300	42.440777	-73.280278	none	12	other	undamage	no flow	none	no flow	none	none	none	VCP	302
SW310	42.442040	-73.277767	none	18	concrete	undamage	no flow	none	no flow	none	none	fish	under foot	66
SW320	42.442045	-73.277764	none	15	metal	undamage	no flow	none	no flow	none	none	none	under foot	NA
SW330	42.440366	-73.272555	none	5	metal	undamage	no flow	none	no flow	none	none	fish	looks clogg	NA
SW340	42.440342	-73.272517	none	5	metal	undamage	no flow	none	no flow	none	none	fish	part of brid	NA
SW350	42.440280	-73.272447	none	4	metal	minor_dam	no flow	none	no flow	none	none	fish	part of brid	NA
SW360	42.440242	-73.272626	none	4	metal	undamage	no flow	none	no flow	none	none	fish	part of brid	NA
SW370	42.440238	-73.272550	none	12	metal	minor_dam	no flow	none	no flow	none	none	fish	part of brid	NA
WB100	42.484006	-73.246168	heavy	36	concrete	undamage	clear	sewage	clear	none	excessive	fish	lots of flow	316
WB1000	42.461696	-73.253945	none	48	metal	moderate_	no flow	musty	no flow	none	none		maybe a c	67
WB1005	42.460300	-73.261186	none	36	metal	major_dam	no flow	none	no flow	none	none	fish waterfo		203
WB1006	42.459015	-73.259971	moderate	36	metal	moderate_	clear	none	clear	none	none	fish waterfo	hidden dee	101
WB1010	42.456867	-73.260932	none	36	concrete	undamage	no flow	none	no flow	none	none	fish	submerged	123
WB1020	42.456798	-73.260952	none	24	concrete	undamage	no flow	musty	clear	none	none		submerged	124
WB1030	42.456818	-73.260737	none	12	concrete	undamage	no flow	none	no flow	none	none			223
WB1040	42.455517	-73.260748	none	48	concrete	minor_dam	none	none	no flow	none	none	fish birds		14
WB1044	42.455194	-73.260570	minor	36	concrete	minor_dam	clear	musty	clear	none	sewage_fu			NA
WB1045	42.454817	-73.261137	none	24	metal	major_dam	no flow	none	clear	none	none		submerged	111
WB1050	42.454448	-73.260996	none	36	metal	major_dam	no flow	none	clear	none	none		submerged	15
WB1060	42.453783	-73.261140	none	18	concrete	major_dam	no flow	none	clear	none	sewage_fu		next to larg	87
WB1070	42.453744	-73.261133	moderate	48	concrete	undamage	clear	sulfide	clear	none	sewage_fu	fish	mist, soun	88
WB1075	42.453645	-73.260919	none	24	metal	major_dam	clear	none	clear	none	none		submerged	392
WB1080	42.452779	-73.261338	none	6	other	undamage	no flow	none	clear	none	none	fish	plastic mat	NA
WB1090	42.452611	-73.261370	none	6	other	undamage	no flow	none	clear	none	none	fish	VCP mater	395
WB110	42.483933	-73.246179	none	5	metal	minor_dam	no flow	none	no flow	none	none	fish	part of brid	NA
WB1100	42.452723	-73.261377	none	4	other	undamage	no flow	none	clear	none	none	fish	VCP mater	NA
WB1110	42.452639	-73.261322	minor	24	metal	minor_dam	clear	musty	clear	none	none	fish		147
WB1120	42.452622	-73.261339	none	36	concrete	moderate_	no flow	musty	no flow	none	none	fish		146
WB1130	42.452608	-73.261216	none	15	metal	undamage	no flow	musty	no flow	none	none	fish	NO MATCI	169
WB1140	42.452747	-73.261361	none	4	metal	undamage	no flow	none	clear	none	none		clogged by	NA
WB1150	42.452663	-73.261382	none	6	metal	undamage	no flow	none	no flow	none	none		8ft up on a	NA
WB1160	42.452645	-73.261387	none	4	metal	other	no flow	none	clear	none	none		clogged by	NA
WB1170	42.452626	-73.261397	none	3	metal	undamage	no flow	none	clear	none	none			NA
WB1180	42.452606	-73.261396	none	4	concrete	minor_dam	no flow	none	clear	none	none			NA
WB1190	42.452581	-73.261361	none	4	concrete	minor_dam	no flow	none	clear	none	none			NA
WB120	42.483918	-73.246180	none	5	metal	minor_dam	no flow	none	no flow	none	none	fish	part of brid	NA
WB1200	42.452559	-73.261381	none	3	metal	undamage	no flow	none	clear	none	none			NA
WB1210	42.452537	-73.261402	none	4	concrete	minor_dam	no flow	none	clear	none	none			NA
WB1220	42.452560	-73.261444	none	4	concrete	other	no flow	none	clear	none	none		partially cl	NA
WB1230	42.452576	-73.261528	none	4	concrete	other	no flow	none	clear	none	none		partially cl	NA
WB1240	42.452524	-73.261552	none	3	metal	undamage	no flow	none	clear	none	none			NA
WB1250	42.452522	-73.261684	none	3	metal	other	no flow	none	clear	none	none		clogged by	NA
WB1270	42.451290	-73.262425	none	12	metal	major_dam	no flow	none	clear	none	none		metal pipe	81
WB1280	42.450441	-73.263222	none	36	metal	major_dam	no flow	none	clear	none	none		submerged	79
WB1290	42.450222	-73.263065	none	12	concrete	major_dam	no flow	none	clear	none	none		caving in	NA
WB130	42.483895	-73.246186	none	5	metal	minor_dam	no flow	none	no flow	none	none	fish	part of brid	NA
WB1300	42.449850	-73.263390	minor	36	metal	moderate_	grey	sewage	clear	none	sewage_fu	Beaver	flow seeps	98
WB1310	42.449819	-73.263362	none	12	metal	undamage	no flow	none	clear	none	none		next to WE	NA
WB1320	42.449754	-73.263212	none	48	concrete	other	no flow	none	clear	none	none		submerged	4
WB1330	42.449032	-73.263087	none	12	concrete	other	no flow	none	clear	none	none		submerged	NA
WB1340	42.448236	-73.264158	none	48	concrete	other	no flow	none	clear	none	none	fish	submerged	82
WB1350	42.446295	-73.262942	none	10	other	moderate_	no flow	none	clear	none	none		VCP	213
WB1360	42.446376	-73.262865	none	4	concrete	undamage	no flow	none	clear	none	none			NA
WB1370	42.446519	-73.263139	none	4	concrete	undamage	no flow	none	clear	none	none			NA
WB1380	42.446456	-73.263000	none	4	concrete	undamage	no flow	none	clear	none	none			NA
WB1390	42.446457	-73.262950	minor	4	concrete	undamage	clear	sewage	clear	none	sewage_fu		next to larg	NA
WB140	42.483936	-73.246235	none	5	metal	minor_dam	no flow	none	no flow	none	none	fish	part of brid	NA
WB1400	42.446458	-73.262866	minor	4	concrete	undamage	clear	sewage	clear	none	sewage_fu		next to, wh	NA
WB1410	42.446373	-73.262831	none	4	concrete	undamage	no flow	none	clear	none	none			NA
WB1420	42.446367	-73.262802	none	4	concrete	undamage	no flow	none	clear	none	none			NA
WB1430	42.446184	-73.261306	none	24	concrete	undamage	no flow	none	clear	none	none		flat bottom	NA
WB1440	42.445896	-73.261064	moderate	60	concrete	undamage	clear	none	clear	none	excessive		big outfall (	128
WB1450	42.444678	-73.260859	minor	42	metal	minor_dam	clear	none	clear	none	sewage_fu			143
WB1460	42.444639	-73.260916	none	12	metal	minor_dam	no flow	none	clear	none	none			NA
WB1470	42.444161	-73.261078	none	12	metal	moderate_	no flow	none	clear	none	none			NA
WB1480	42.444020	-73.261023	none	12	concrete	minor_dam	no flow	none	clear	none	none			NA
WB1490	42.443972	-73.261017	none	4	metal	undamage	no flow	none	clear	none	none		part of brid	NA
WB150	42.483926	-73.246238	minor	2	metal	minor_dam	clear	none	clear	none	none	fish	part of brid	NA
WB1500	42.443887	-73.261019	none	4	metal	undamage	no flow	none	clear	none	none		part of brid	NA
WB1510	42.443850	-73.261014	none	4	metal	minor_dam	no flow	none	clear	none	none		part of brid	NA
WB1520	42.444142	-73.260898	none	4	metal	minor_dam	no flow	none	clear	none	none		part of brid	NA
WB1530	42.444111	-73.260866	none	20	metal	moderate_	no flow	none	clear	none	none		part of brid	NA
WB1540	42.444056	-73.260855	none	4	metal	moderate_	no flow	none	clear	none	none		part of brid	NA
WB1550	42.443893	-73.260817	none	20	metal	minor_dam	no flow	none	clear	none	none		part of brid	NA
WB1560	42.443795	-73.260791	none	4	metal	minor_dam	no flow	musty	clear	none	none		part of brid	NA
WB1570	42.443740	-73.260752	none	12	concrete	undamage	no flow	none	clear	none	none		next to brid	NA
WB1580	42.443486	-73.260601	none	24	metal	major_dam	no flow	none	clear	none	none		widespreac	168
WB1590	42.442657	-73.260738	none	12	concrete	minor_dam	no flow	none	clear	none	none		part of rock	5
WB160	42.483905	-73.246241	none	5	metal	minor_dam	no flow	none	no flow	none	none	fish	part of brid	NA
WB1600	42.441206	-73.260055	minor	60	concrete	minor_dam	clear	musty	clear	none	excessive		alongside (	195
WB1605	42.441162	-73.260022	none	12	other	moderate_	no flow	musty	no flow	none	none		VCP mater	196
WB1610	42.440967	-73.260265	none	12	concrete	undamage	no flow	none	clear	none	none			282
WB1620	42.440324	-73.260831	none	18	metal	minor_dam	no flow	none	clear	none	none			174
WB1630	42.440279	-73.260882	none	6	metal	undamage	no flow	none	clear	none	none			NA
WB1640	42.439365	-73.261607	none	16	metal	minor_dam	no flow	none	no flow	none	none	fish waterfo	at very enc	83
WB1650	42.436569	-73.257200	none	12	concrete	major_dam	no flow	none	clear	none	none		next to brid	NA
WB1660	42.436372	-73.256695	none	12	metal	major_dam	no flow	none	clear	none	none		part of brid	NA
WB1670	42.436404	-73.256928	none	12	metal	major_dam	no flow	none	clear	none	none		part of brid	NA
WB1680	42.436435	-73.257030	none	12	metal	major_dam	no flow	none	clear	none	none			NA
WB1690	42.436535	-73.257012	none	24	metal	minor_dam	no flow	none	clear	none	none		next to brid	78
WB170	42.483892	-73.246240	minor	4	metal	minor_dam	clear	none	clear	none	none	fish	part of brid	NA