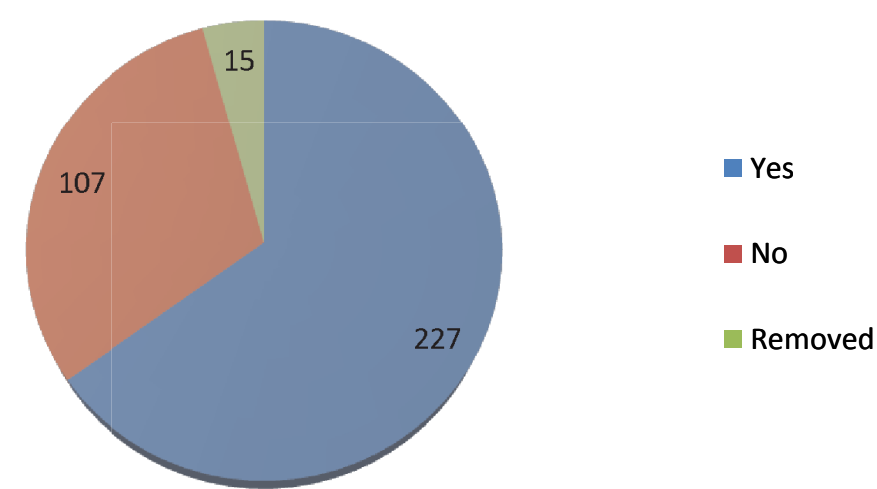


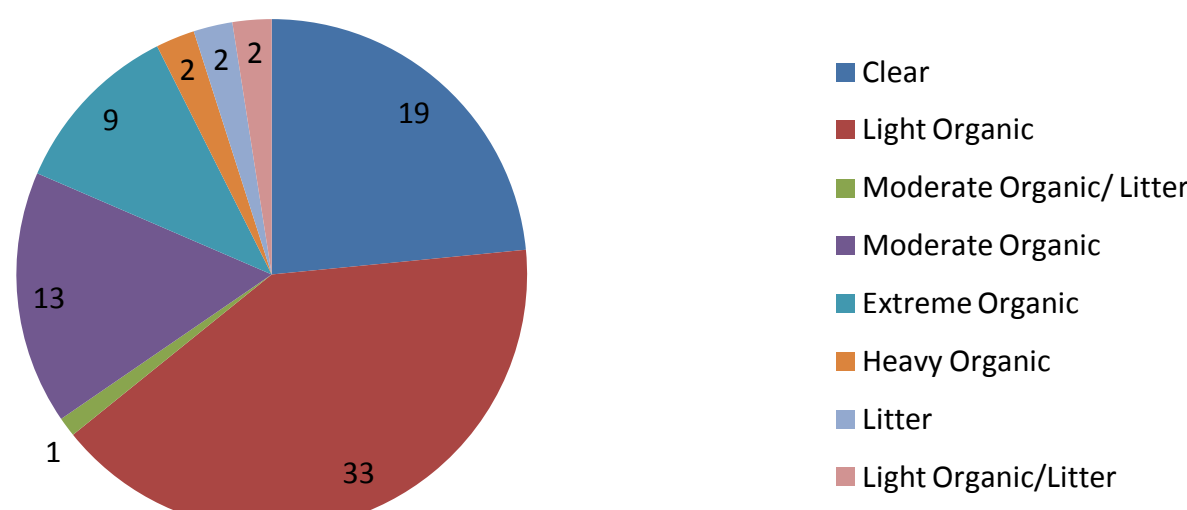
A Suburban Assessment of Storm Drains; Implications for Non-point Source Pollution, Neighborhood Initiatives & the Education Imperative

Jeffrey Eker, Julia Gross, Jared Novak;
Environmental Science Students, Haddonfield Memorial HS

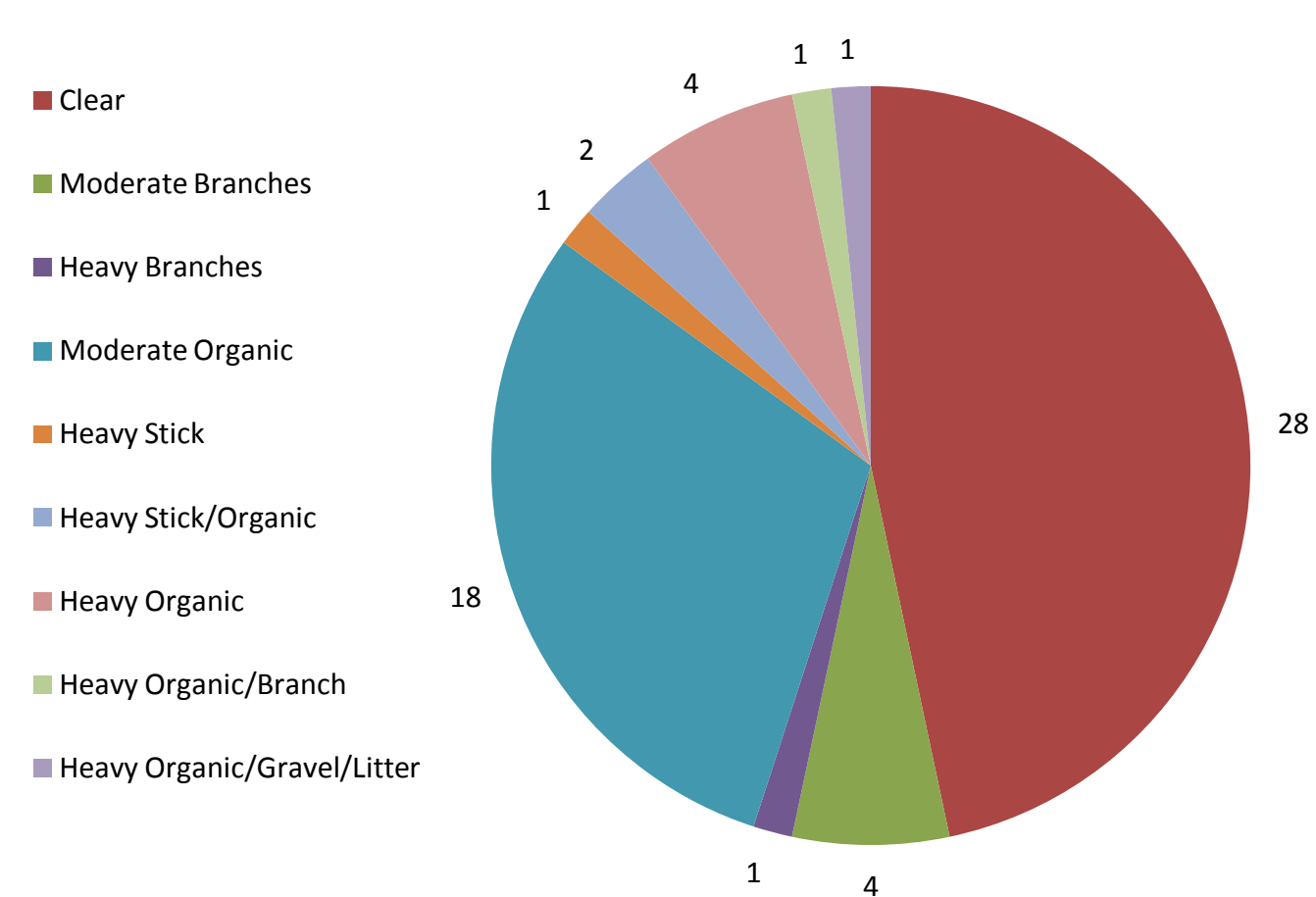
Storm Drain Status for all Regions; Marked, Unmarked or Marking Removed



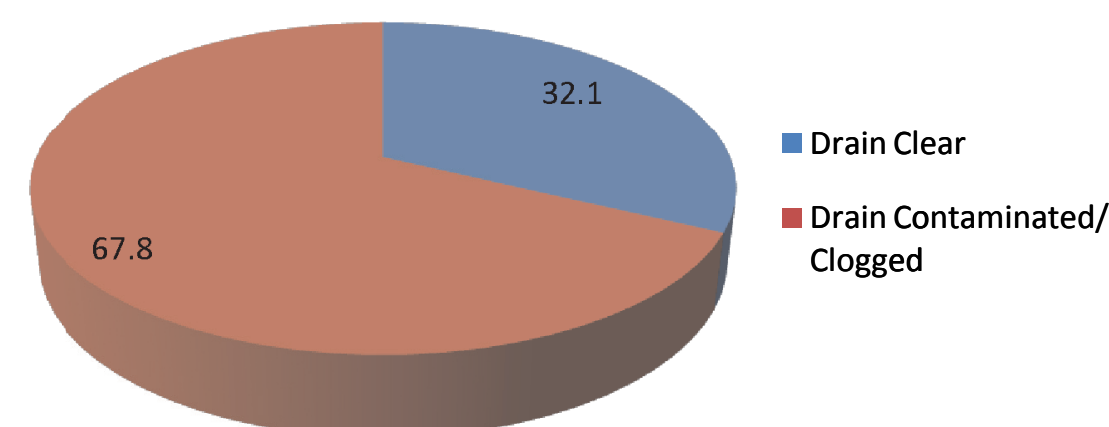
Breakdown of Storm Drains in the Purple Region Based on the Type of Pollution Present



Breakdown of Storm Drains in the Blue Region Based on the Type of Pollution Present



Haddonfield Drain Comparison; Percent Breakdown from a Total Sample of 348 Storm Drains



Abstract

Non-Point Source pollution contributes significantly to water quality issues the world over. Where there is development and human activity, there exists potential impact. Knowledge of the watershed in which we live, work and recreate is critical if we are to reduce sediment, nutrients, organics and other pollutants that make their way into our streams and rivers via runoff.

Case studies from our largest watersheds have brought to light the issues of non-point source pollution and the effects of the associated contaminants. The problems detected in the waters of the Delaware and other large rivers throughout the country begin in the tributaries flowing through rural, suburban and urban landscapes.

The town of Haddonfield, NJ, like many municipalities within the Lower Delaware Watershed, has storm drains that empty into tributaries that flow into the Delaware. Water drains from sidewalks, driveways, road surfaces and recreational areas bringing with it chemicals, sediment and debris associated with maintenance, upkeep and waste of properties and municipal facilities.

In the spring of 2012, we assessed every storm drain in the town of Haddonfield. Each one was assigned to a region and ranked based on condition and pollution/ debris presence. Our ranking and results, supplemented by photo-documentation, supports the notion that community (residential and municipal) contribution to non-point source pollution is serious and widespread. Based on the results of our project we also suggest that community programs that establish monitoring and clearing of storm drains are essential. Both regular municipal services as well as volunteer participation will go a long way to stemming the flow of contaminants into our water bodies.

Studies of the state of regional and/or municipal storm drains by citizens is an effective strategy in the ongoing effort to address non-point source pollution as it will educate the public on their impact and generate important data on the severity of the issue.

Description of Drain Features

Clear

There is nothing on or near the storm drain Sticks or Branches

Fallen sticks from trees are on or near the drains. Often, sticks will act as a structure to capture and hold other pollutants near the drain leading to the drains ineffectiveness. This could lead to water build-up and flooding which bring in unwanted fertilizers and runoff into the system.

- Moderate – several smaller sticks or one thick branch
- Heavy – many sticks covering the entirety of the drain grate or a several thick branches

Organic

Debris from living matter; the most common of the organic pollutants are leaves or decomposing grasses and other foliage. This could lead to water build-up and flooding which bring in unwanted fertilizers and runoff into the system.

- Light – a handful of organic materials
- Moderate – organic materials cover less than half of the storm grate
- Heavy – organic materials cover a majority or all of the storm grate
- Extreme – a thick mat of organic materials cover the entire grate
- Other categories included with organic pollution:
 - Sediment – noticeable build up of topsoil and fertilizers
 - Plant Growth – plants are physically growing out of the drain

Litter

Any manmade substance or material that has accumulated on or around the drain. These pollutants could travel into the water stream at the other end of the storm sewer system causing a multitude of problems.

- *No specification* - one small biodegradable item of litter
- Light – one piece of non-biodegradable litter

- Moderate – several pieces of non-biodegradable litter
- Heavy - litter that has accumulated in piles covering more than half of the drain
- Other categories included with litter:
 - Sheet Metal – large piece of sheet metal

Rock

There are several individually labeled groups of rocks.

- Gravel – small pieces of stone
- Asphalt – fragmented roadway (many water polluting chemicals)
- Rock – larger pieces of stone

Hazardous

There was one hazardous situation where on a construction site spray paint cans were left in the sewer pit. This could lead to introducing a slew of chemicals found in the paint into the waterway where the drains disperse water.

Chutes

These storm drains provide zero filter of materials entering into the water stream.

- Asphalt – often degraded into chunks of fragmented structure with large amounts of erosion.
- Metal - complicated structure built to carry water a long distance from the roadway
- Dirt – water simply dumps off the roadway. Uncontrolled erosion occurred at these locations

Dead Animal

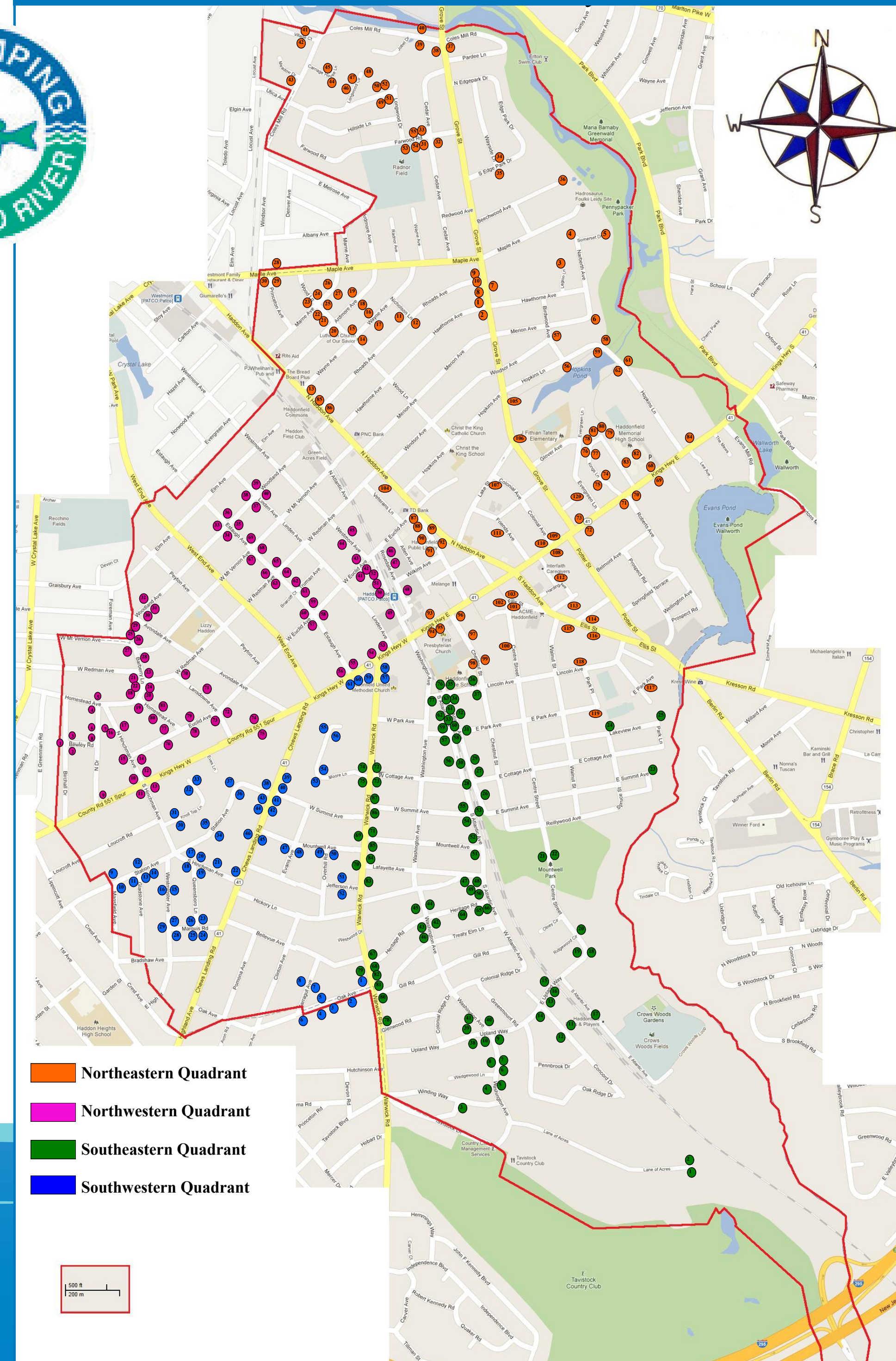
At one location, a raccoon was found deceased on top of a drain. As it sits on top of the drain, it will turn rancid, and act as a structure that can accumulate further pollutants.

Completely Clogged

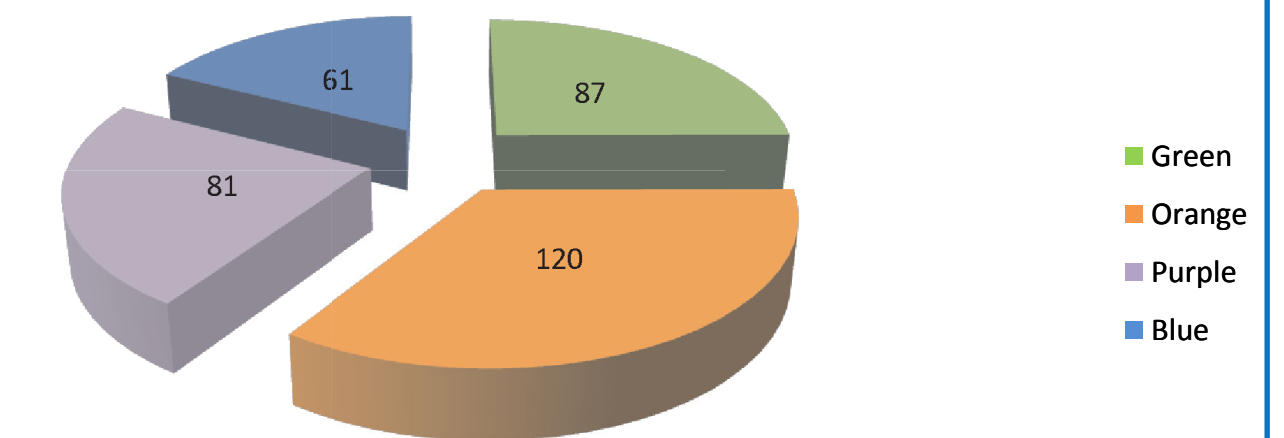
This drain has become ineffective because a combination of several pollutants buried within the pit of the drain have completely filled its chamber.



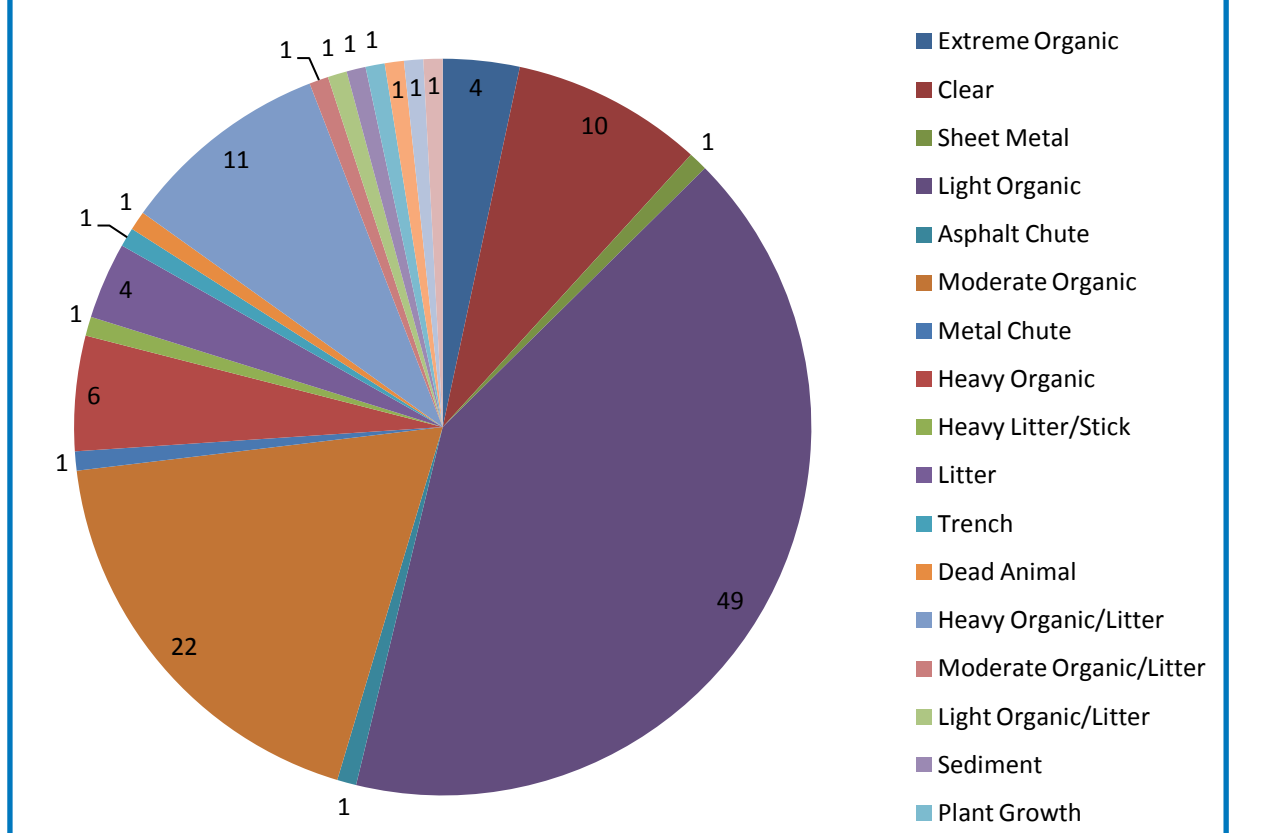
Storm Drains Distribution Map Haddonfield, NJ



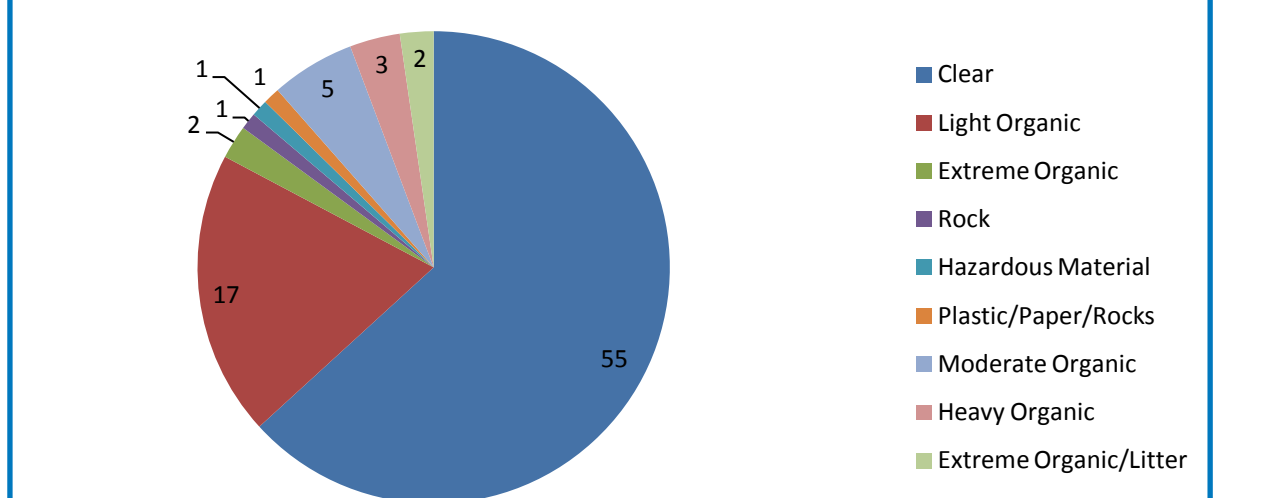
Total Number of Storm Drains Surveyed Based on Colored Region - see map for drain regions



Breakdown of Storm Drains in the Orange Region Based on the Type of Pollution Present



Breakdown of Storm Drains in the Green Region Based on the Type of Pollution Present



Haddonfield Storm Drain Region; Comparison of Contamination/ Clogged Drains

