

# ASK YOUR ENVIRONMENTAL COMMISSIONER

## What are microplastics and how do they affect us and our environment?



11.15.2020

In the hundred years that plastics have been around, they have become ubiquitous. Microplastics, the polymers that are 5 millimeters or less in size, are now found just about everywhere in our environment, including the food we eat, the water we drink, and the air we breathe. They come from one of two sources: either from a larger plastic item that has broken down into smaller pieces, or they were initially manufactured as a tiny polymer for use in consumer products.

Consumer plastics vary in type and although there are about six common types, we currently only recycle three types in Rumson. They can be identified by the numbers 1, 2 & 5 inside a triangle stamped on the item. Probably one of the most common is polyethylene terephthalate (PET or #1), which is used to make soda and water bottles, peanut butter containers, condiment bottles and the like. Milk jugs, detergent & shampoo bottles, are all made from high density polyethylene (HDPE or #2). Bottle caps, straws, yogurt containers, and food containers are made of polypropylene (PP or #5). Other types of plastics including styrofoam, straws, toys, plastic bags, PVC pipe and cereal box liners are not as easily recycled.

All of these plastic items, like most polymers, take a very long time to degrade. A plastic grocery bag takes 20 years to decompose; nylon fabric takes 30-40 year; styrofoam cups take 50 years; disposable diapers and water bottles take 450 years; and monofilament fishing line takes 600 years.

With such a long life, plastics have plenty of time to break down into smaller and smaller micro-pieces. Heat, sunlight, harsh weather, and mechanical wear-and-tear weaken the polymers to break into small fragments which do not biodegrade quickly. Microplastics can also come from plastic “dust” during construction or industrial processes, and even from rubber tires that emit fine polymer particles as they wear down on the roads. This all enters our bodies through the food we eat (which may have ingested the polymers first), the water we drink, and through the miniscule polymer particles in the air we breathe. It’s been estimated that a credit-card’s weight worth of microplastic enters our bodies every week.

Manufactured microplastics include microbeads and nurdles. Polyethylene microbeads were actually created as microplastics for use in toothpastes, facial scrubs and many other personal-care products. Smaller than a sand grain, they enter the waterways and oceans easily, because many water-treatment facilities are unable to filter the tiny pieces out. While the use of microbeads is prohibited by law now, they still exist due to the long life of plastics and will be around for hundreds of years to come.

Nurdles are resin pellets of plastic material, about the size of a lentil. Typically, recycled plastic is cleaned and then reformed into long thin rods which are then cut into tiny pieces called nurdles; these pieces are then melted by manufacturers to make new plastic products. Nurdles can be found on our local beaches and waterways in many colors, and often exhibit signs of significant abrasion. They are extremely long-lasting and may enter the environment through loss during transportation or transfer. Wind and ocean currents can spread nurdles world-wide.

Plastics are both a boon and a curse. They are useful and universal in our cultures, from clothing to industrial products. Polymers can be essential and save lives as medical assets. Unfortunately, many are items that are used once and then discarded; yet their polymer structure causes them to be extremely durable, so that they do not just disappear once discarded, but remain in the environment for decades or centuries. Plastics also impact ocean life in various ways. Marine animals caught in plastic netting or consumer products are directly affected as they become trapped in the debris, with decreased mobility and function. Marine animals can consume nurdles and other microplastics intentionally, thinking they are tasty eggs or larvae, or accidentally when they ingest the plastics along with other foods. But polymers decompose slowly, so microplastics may remain in the digestive systems for a long time, resulting in malnutrition and starvation.

Various solutions are available for both individual and community use. Recycling of plastics into other polymer items such as insulation, furniture, and consumer goods is a viable option for controlling discarded plastics, although success rates vary widely (some estimates are that only 9% of our trash is recycled due to contaminants and neglect). Creative engineering and chemical solutions are being developed to remove plastics directly from the water, or to reformulate polymers for faster degradation, such as adding a simple sugar to the polymer that attracts bacteria to eat it. Behavioral changes can make a big difference, such as refusing to use disposable plastic products like straws or wraps, and only using refillable bottles instead of single-use plastic ones; not only does this eliminate waste from the environment, but it reconfigures how our culture views and values disposable items overall. In November 2020, Governor Murphy signed Senate Bill 864 into law, which banned single-use plastic bags, Styrofoam products like takeout containers and meat trays, and plastic straws. This mandatory behavior change will provide long-term benefits by eliminating a major source of plastic litter, as well as reducing the need for fossil fuels to make these plastics in the first place.

Recycling, behavior changes, legislative bans, and especially education in schools, colleges, and through environmental groups can all promote awareness of the plastic problem and identify solutions. By individual commitment and community involvement, we can inspire responsibility and stewardship for the environment, and all work towards solving the plastic problem. Please visit the Rumson Environmental Commission website for more detailed information about related issues such as recycling, water quality and pollution. [www.rumsonnj.gov/env](http://www.rumsonnj.gov/env)

Jody V. Sackett is a member of the Rumson Environmental Commission and has lived in Rumson for over 25 years. She has been an environmentalist all her life and, in addition to serving her town as an active member of the Environmental Commission, she works for the NJ Sea Grant Consortium as an educator and program administrator.