



Community Environmental Advisory Commission

INFORMATION CALENDAR

January 22, 2019

To: Honorable Mayor and Members of the City Council
 From: Community Environmental Advisory Commission (CEAC)
 Submitted by: Michael Goldhaber, Chairperson, CEAC
 Subject: Referral Response: Removing Plastic Microfibers from the Water Supply

INTRODUCTION

On April 24, 2018, the City Council adopted a referral sponsored by Councilmember Harrison which asked CEAC to assess the City of Berkeley's capacity to participate in an educational outreach program to inform City residents of the harmful nature of plastic microfibers, and to refer any findings to the East Bay Municipal Utilities District (EBMUD). A copy of that referral is included as Attachment 1 to this report.

At its November 8, 2018 meeting, the Commission approved the referral response for removing plastic microfibers from the water supply. M/S/C (Gould, Kapla). Ayes: Simmons, Varnhagen, Ticconi, Kapla, Goldhaber, Gould. Noes: None. Absent: Hetzel, Lim. Abstained: None

BACKGROUND

Human-made microplastics are now ubiquitous and persistent in aquatic environments, and are derived from several sources, including the washing of clothes. Every level of the food web is exposed to microplastics, from primary producers to higher trophic-level organisms. Not much can be done to remove microplastics from clothes wash water; the efficiency of the few control methods on offer has not been well documented.

Microplastics are defined as plastic pieces or fragments less than 5 millimeters in diameter. Microplastics have been accumulating in the marine environment for several decades, and likely to increase in abundance given the current dependence of a growing human population on the use of persistent plastics. Microplastics, in origin, can be primary products, that is purposefully manufactured, or secondary products, derived from the fragmentation of plastic items. They are a persistent pollutant, already present in all marine habitats. It has been estimated that 10% of globally produced plastics in 1997 ended up as plastic oceanic waste. If these estimates are correct and these trends continue, an estimated 38 million tons of debris would have entered the marine environment in 2015 alone.

Sources of aquatic microplastic pollution include: (1) microbeads used in personal care products such as facial scrubs and toothpastes, and pellets (called nurdles) used as precursors for industrial products; (2) microfibers derived from washing clothes made with synthetic materials; and (3) fragments of larger plastic items. In general, the most abundant marine microplastics detected are polyethylene from plastic bags and storage containers, polypropylene from bottle caps and ropes, polystyrene from utensils and cups, and polyamide (nylon) from ropes, fishing nets and textiles. Based on a study of the Los Angeles watershed, 90% of plastic debris by count, and 13% by weight are microplastic of less than 5 millimeters.

As part of the Regional Monitoring Program, San Francisco Estuary Institute scientists characterized Bay surface waters and effluent from waste water treatment plants for microplastic contaminants such as Styrofoam, microbeads used in personal care products, fragments from the degradation of larger plastics such as bottles, nurdles as precursors to plastic manufacturing, and fibers from clothes and fabrics. The eight Waste Water Treatment Plants, including EBMUP, studied discharged an average of 6,900,000 particles of microplastic per day with fibers being the dominant microplastic. Treatment plants with higher solids removal efficiency did not remove more plastics than the less efficient treatment plants. Fragments, including microbeads were the second most abundant microplastic in treatment plant effluent. In the Bay, fragments were the most abundant microplastic measured with fibers being the second most abundant type of microplastic.

One estimate is that in 2050 there will be more plastic than fish in the sea.

ENVIRONMENTAL SUSTAINABILITY

Knowledge about the effects of microplastics is limited, but there are concerns that these particles could have adverse physical and toxicological effects on marine species. The consequences of ingestion of microplastics by marine organisms are not fully understood. However, laboratory studies have found that microplastics can harm small aquatic organisms that eat them, by interfering with feeding, digestion and reproduction, for example. There is also evidence that particles can be retained for several weeks after ingestion by marine organisms. However, more studies about such physical effects are needed,

There is also some concern that the ingestion of microplastics can cause physical effects, such as internal abrasion and blockage, and may also provide a pathway for the uptake of harmful chemicals by marine organisms. Species that show a high incidence of debris ingestion may therefore be susceptible to population-level effects, which could have negative consequences for endangered species with small populations that are exposed to multiple stressors.

Uptake of microplastics has recently been reported in commercially reared shellfish grown in open systems, indicating that microplastics are being ingested by humans via seafood. Plastic fibers are now showing up in fish and shellfish sold in California for human consumption. The potential health risks to humans of ingesting microplastics from the marine environment are not fully understood.

POSSIBLE FUTURE ACTION

The current water and wastewater technologies do not remove plastics from the environment. As such, removal of plastics from the environment is not currently feasible via treatment, leaving source removal as the only alternative to lower plastics debris in the aquatic environment.

The following is derived from a publication of the Plastic Pollution Coalition. Every time you wash synthetic fabrics made of acrylic, nylon, and polyesters, including fleece, trousers, blouses, socks, and yoga pants, millions of microfibers are released into the water. Microfibers are not filtered out by waste treatment plants, so they end up in our waterways and oceans, where they impact marine organisms and the environment. One approach under study to reducing the release of microfibers into the environment involves altering textiles to make them less likely to shed fibers into the environment during everyday use or into water when they are washed. Another approach now available each of us is to:

- Wash synthetic clothes less frequently and for a shorter duration;
- Fill up your washing machine fully, reducing friction between clothes;
- Use liquid laundry soap;
- Use a colder wash setting;
- Dry spinning clothes at low revs;
- When you clean out your dryer, place lint in the trash;
- Purchase a washing machine lint filter or a wash bag, such GUPPYFRIEND from Patagonia or Rozalia Cora Ball (note that their microplastic removal effectiveness has not been verified in any published, peer-reviewed study);
- Speak up and tell clothing designers to choose natural fabrics that aren't prone to shedding;
- Tell your friends and family about microfiber pollution;
- Avoid purchasing cheaply-made, "fast fashion" clothes; and
- Buy clothes made from natural fibers such as cotton, linen, and wool. (However, at least cotton production has its own problems unless organic, namely high use of pesticides and fertilizers that also impact waters around the world.)

The water and wastewater agencies, including EBMUD, are aware of the issue, and participating in studies about plastics in waters. Therefore, outreach to these agencies

may not be necessary. So basically, public outreach and education is the most likely approach to reducing plastics in waters.

FISCAL IMPACTS OF POSSIBLE FUTURE ACTION

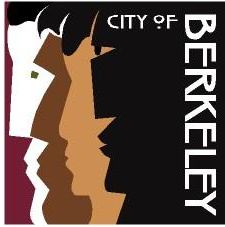
Fiscal impacts are limited to the costs of a public education campaign for which the costs could be minimized if the City were to pursue such a program in conjunction with other local municipal agencies or NGOs.

CONTACT PERSON

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Attachments:

1: Council referral from April 24, 2018



[First Last name]
Councilmember District [District No.]

REVISED AGENDA MATERIAL for Supplemental Packet 2

Meeting Date: April 24, 2018

Item Number: 26

Item Description: Removing Plastic Microfibers From The Water Supply: A Referral to the Community Environmental Advisory Commission

Submitted by: Councilmember Harrison

Edited to reflect the intention of sending any relevant findings to EBMUD.

To: Honorable Mayor and Members of the City Council

From: Councilmember Kate Harrison

Subject: Removing Plastic Microfibers From The Water Supply: A Referral to the Community Environmental Advisory Commission

RECOMMENDATION

Refer to the Community Environmental Advisory Commission to assess the City's capacity to participate in an outreach program informing residents of the harmful nature of microfibers. [Ask CEAC to refer any of their findings to the East Bay Municipal Utility District and request a report on the organization's water sourcing methods in drought years.](#)

FINANCIAL IMPLICATIONS

Not applicable, due to its status as a Commission referral.

BACKGROUND

The harmful nature of microfibers--tiny plastic bits often emerging from synthetic material--is the subject of a fledgling research movement. In recent years, concerned scientists have noted the prevalence of microfibers in a tap water supply and attempted to determine the impact of their presence. In the US, this issue is particularly urgent; according to a study conducted by Orb Media, 94% of their tap water samples contained plastic fibers. That rate ranked as the highest in the world.

Experts believe the toxic materials present in the microfibers could be of potential harm to human beings.

"We have enough data from looking at wildlife, and the impacts that it's having on wildlife, to be concerned," Dr. Sherri Mason, a microplastics expert at the State University of New York in Fredonia, told [The Guardian](#). "If it's impacting [wildlife], then how do we think that it's not going to somehow impact us?"

There are certain preventative measures individuals can take to limit their microfiber emissions. [Machine washing](#) Washing synthetic clothing [in a machine](#) allows these fibers to escape from our washing machines and filter out into [sewage treatment plants like the ones maintained by EBMUD](#) ~~our water streams~~. One study indicates each wash of a synthetic jacket produces up to 2 grams of microfibers. By making a concerted effort to avoid washing one's own synthetic clothing as much as possible, individual steps can be taken to lessen the quantity of microfibers in a local context. [Other potential preventative measures include purchasing industry standard washing bags that filter out microfibers and investing in a top load washing machine.](#)

[Generally, Berkeley residents can be confident in their water quality. In non-drought years, the Sierras serve as the City's primary water source. Because the Sierras lie a distance from any wastewater sources, this water bears no risks of microfiber contamination. However, EBMUD's water sourcing methods in drought years remains](#)

unclear. There is a possibility that microfibers find their way into EBMUD's sewage treatment plants in these conditions, but it will require a dialogue with EBMUD to confirm one way or another.

~~Other potential preventative measures include purchasing industry standard washing bags that filter out microfibers and investing in a top load washing machine.~~

~~Unfortunately, the toothpaste is out of the tube, so to speak. With our water stream already treatment facilities irrevocably potentially contaminated, the City ought to look into measures to curb their impact.~~

~~From the perspective of this Councilmember, an informational campaign is the City's best mechanism for addressing this issue.~~

This item proposes the Community Environmental Advisory Commission compile a list of the most harmful microfiber-related behaviors, consider the most effective methods of distributing this information, and estimate any potential financial cost to the City. Once compiled, the item recommends the Commission send their findings to EBMUD and then request a report on the organization's water collection tactics during drought seasons.

ENVIRONMENTAL SUSTAINABILITY

This item intends to improve the City's environmental practices.

CONTACT PERSON

Kate Harrison, District 4 Councilmember, 510-981-7140

