



January 5, 2018

Dear Key West City Commissioners,

I am writing in strong support for the proposed ordinance to prohibit the sale of sunscreens containing the chemicals oxybenzone and octinoxate in Key West. These ingredients have been proven to harm our reefs AND our bodies. There are safe alternatives like non-nano titanium dioxide and zinc oxide that are just as (perhaps even more) effective than chemicals that kill coral reefs.

I am the founder and formulator of Stream2Sea, an environmentally-friendly product line formulated without using oxybenzone, octinoxate or any other ingredients known or suspected to harm the coral reef environment (there are quite a few). I'm a cosmetic chemist with more than 20 years' experience formulating natural products, a part-time Monroe County resident and an avid technical diver. I started Stream2Sea specifically to produce sunscreens that protect marine ecosystems while still meeting or exceeding FDA standards.

We use only non-nano titanium dioxide as the active ingredient in our sunscreens. This gives our customers long-lasting protection from the UVB rays that burn – and significant protection from UVA and UVC rays that are more likely to cause skin cancer and aging. (The reason most chemical sunscreens contain multiple ingredients is that each absorbs only a portion of the sun's rays. Sunscreens made with non-nano minerals sit on the skin and reflect a greater portion of the rays, giving users true broad-spectrum coverage with single active ingredient formulas.)

The Florida Department of Environmental Protection already recommends against using sunscreens with oxybenzones, although it's a voluntary educational initiative not a ban on sales. Concentrations of these chemicals can cause damage at incredibly low concentrations, about 62 parts per trillion or one drop in 6.5 Olympic-sized swimming pools. The Florida Keys are being impacted – a 2015 study showed oxybenzone concentrations of 4,474 parts per trillion off Bahia Honda.

Our products are widely available in Key West in both dive shops and gift and eco-tour locations including:

- Divers Direct
- Finz
- Captain's Corner
- Southpoint Divers
- Date & Thyme
- Reef Relief
- Key West Bait and Tackle
- Key West Eco Tours
- World Sailing Adventures
- New Leaf Skincare



- Mel Fisher Maritime Museum

The argument that this ban will reduce the consumer's choices of safe and effective products is laughable. All mineral products that are legally sold in the US, including Stream2Sea, meet or exceed FDA standards for SPF, broad-spectrum coverage and water-resistance. Below and under separate cover, I am sending reports from Eckerd College and Mote Marine Laboratories showing that our mineral sunscreens are non-toxic to various species tested, including coral *Porites astreoides* larvae.

I am also sending a copy of a recent article from Lancet, one of the world's most prestigious medical journals, supporting the ban on oxybenzone and octinoxate both from an environmental perspective and the fact that rates of sun cancer – particularly melanoma – are rapidly increasing in spite of increased sunscreen use. I've also attached abstracts from other well-respected international publications on oxybenzone and octinoxate questioning their continued use from both human and ecological perspectives. (Please let me know if you would like full copies of the reports but they tend to be lengthy and complicated.)

One other important issue that is seldom addressed is the fact that wastewater treatment plants do not remove either oxybenzone or octinoxate so even treated water is impacting the coral reefs off Key West. In fact, one study (highlighted in the attachments) notes the chlorine in wastewater treatment facilities or swimming pools actually breaks oxybenzone down into even more toxic byproducts.

While there are many challenges to our reefs that we cannot individually impact (ocean acidification, over population, climate change), sunscreen pollution is a very easy one to eliminate. I applaud the leaders of Key West for not being swayed by the chemical industry lobbyists that are working hard to bias your opinion.

The science here is clear. Oxybenzone and octinoxate are lethal for coral reefs (and arguably not safe for humans). With natural, effective options available in a city where coral reefs are the backbone of a booming economy, the only logical decision is to take the steps necessary to protect your reef.

Again, I fully support your efforts. If I can be of any assistance, please do not hesitate to contact me.

Consciously,

Autumn P. Blum
Formulator & CEO
Stream2Sea, LLC
autumn@stream2sea.com



STREAM2SEA®
— EcoConscious • Biodegradable —



ECKERD COLLEGE
COLLEGIUM OF NATURAL SCIENCES

August 2, 2015

Autumn Blum:

We have tested Stream2Sea products including Sunscreens for Face & Body (SPF 20 & 30), Conditioning Shampoo and Bodywash, Leave-In Conditioner, After Sun Lotion, and After Sun & Sting Gel for potential toxicity on *Danio rerio* and *Caenorhabditis elegans*. Mortality, movement and feeding behaviors were tested. At concentrations above that which is likely to be found in either waste water or marine settings we did not find any evidence of toxicity.

Sincerely,

Denise B. Flaherty

Dr. Denise B. Flaherty,
Assistant Professor of Biology



STREAM2SEA®
—EcoConscious • Biodegradable—



ECKERD COLLEGE

July 31, 2015

Dear Autumn:

We have tested Stream2Sea sunscreens (both SPF 20 and SPF 30) against larvae of the Caribbean coral *Porites astreoides*. In our laboratory-based assays, we did not find evidence for statistically significant lethal toxicity to the larvae or for statistically significant inhibition of settlement in the larvae. These controlled, blind assays were performed in the laboratory, using a range of concentrations, the highest of which has been determined to be ecologically relevant in prior published research studies.

Sincerely,

Koty Sharp
Assistant Professor
Biology & Marine Science