

COMMENT TO BE CONSIDERED FOR THE ENVIRONMENTAL IMPACT STATEMENT FOR THE LOS OSOS WASTEWATER PROJECT

Conclusion:

Based upon the preliminary analyses outlined below, we urge that the Los Osos Wastewater Treatment Project EIR carefully consider the effectiveness of the alternative wastewater treatment options in treating nonylphenols and other potential endocrine disruptors.

Comment:

Recent work by the San Luis Obispo Science and Ecosystem Alliance (SLOSEA) has discovered tumor growths in fish that inhabit the mudflats of Morro Bay. Further analysis showed that these tumors of reproductive organs (gonads) and the liver may be caused by an organic pollutant. Subsequent chemical analyses of fish liver tissues of over 60 organic pollutants showed that nonylphenol was the most concentrated chemical. A survey of the literature shows that nonylphenol is an endocrine disruptor that can bind to the estrogen receptor. Nonylphenol is used widely as a detergent (as a component of alkyl(mostly nonyl)-phenol ethoxylates) in a wide-range of industrial and household cleaning products, in pesticide formulations as an inactive ingredient, in paints, cosmetics and as a spermicide in condoms. It often enters the environment through sludge from waste water treatment plants (WWTP) that is distributed onto agricultural fields.

Our initial findings were confirmed by follow-up studies on other fish and marine invertebrate species, some of them used for commercial purposes. Chemical analyses of sediment samples show that nonylphenol is found throughout the bay, suggesting a continuously high source of nonylphenol that discharges into the bay exists. The concentrations of nonylphenol in the sediments are dependent on the organic composition and aerobic conditions of the sediment. Thus it is also possible that nonylphenol discharged by episodic events may accumulate and stay inert in the sediment for months or longer. Initial analyses of sediment samples from downstream the WWTP at the California Mens Colony show ten times the levels of nonylphenol that were found in the bay. Samples taken from two public septic systems in Los Osos are currently analyzed. Studies on septic systems and associated leach fields shows that they are frequently the source of heavy nonylphenol contamination into the environment. The factors that play into such a scenario are complex because they depend on the physical structure of the septic systems, the aerobic conditions and microbial community of the surrounding soil as well as on hydrological parameters. After consulting with the environmental advisor of the local power plant we feel confident that they are aware of nonylphenol and have not been a major source of it in the past (although other unknown issues may surface).

The extent of nonylphenol contamination of near shore coastal ecosystems, specifically estuaries, is greater than it occurs from our studies in Morro Bay alone. We have detected nonylphenol in fish from Tomales Bay and we know of data suggesting that it is widespread in southern California.

It is likely that nonylphenol causes the tumors in fish in Morro Bay, but it is by no means proven. The nature of the effect detergents have on tissues is that they can also

enhance synergistic effects, meaning that they can exaggerate the effects of other pollutants that may be in the environment at concentrations considered safe under testing conditions ignoring such effects. We also found extremely high levels of nonylphenol in fish higher up the trophic food chain in Morro Bay. These levels are likely to also cause pathologies in these fish (we have not directly addressed this question).

Nonylphenol seems to emerge as an ubiquitous pollutant affecting the endocrine (at low levels) and may be other physiological processes (tumor growths) of our aquatic life. Although it is not a unique problem to Morro Bay, at this point it occurs that it is the major pollutant threatening the marine life in Morro Bay. It seems that the reduction or elimination of nonylphenol from the waters and sediments of Morro Bay, probably through appropriate waste water treatment conditions, may be a very important step towards restoring and maintaining the relatively pristine state of Morro Bay. Thus, when you consider various wastewater treatment options for Los Osos, it seems important to specifically consider treatment option for nonylphenol and other endocrine disruptors, especially given that in the case of nonylphenol treatment systems that rely heavily on anaerobic processes and redistribution of sludge in the watershed may increase the concentrations of nonylphenol and its delivery to the bay and ocean. SLOSEA is interested in serving the community in addressing this issue with our scientific expertise and dedication to a sustainable management practice of Morro Bay.

Sincerely,

Dr. Lars Tomanek, Science Team Member

Dr. Dean Wendt, Director

San Luis Obispo Science and Ecosystem Alliance (SLOSEA)

Center for Coastal Marine Sciences
Cal Poly State University
San Luis Obispo, CA 93407-0401