



Center for Coastal Marine Sciences ~ Biological Sciences Department
California Polytechnic State University San Luis Obispo, CA 93407
Office -805:756-6068 Fax - 805:756-7314
info@slosea.org <http://www.slosea.org>

SLOSEA Management Action Memo Protecting Coastal Environments from Ongoing Pollution Danger October 20, 2010

Action Opportunity

To protect our coastal and ocean resources and sustain a healthy fishing industry, federal, state, and local agencies must act to regulate the use and manage the treatment of nonylphenol (NP) and nonylphenol ethoxylates (NPEs). NP and NPEs are produced in large volumes, with uses that lead to widespread release to the aquatic environment. Exposure to these chemicals has been linked to reproductive toxicity in aquatic organisms.

Situation

NP's main use is in the manufacture of NPEs. NPEs are nonionic surfactants that are used in a wide variety of industrial applications, such as pesticides and consumer products (including shampoos, lotions, plastics and paper products.) Some other uses, such as dust-control agents, lead to direct release to the environment. NPEs, though less toxic and persistent than NP, are also highly toxic to aquatic organisms, and, in the environment, degrade into NP. For example, studies have shown the potential for nonylphenol to cause feminization in wildlife, such as fish, as well as being a potential factor in the increasing incidence of reproductive organ disorders and decreasing sperm counts.

Studies have detected NP in human breast milk, blood, and urine, and have associated NP with reproductive and developmental effects in rodents. Aquatic and marine life exposure occurs when substantial quantities of this chemical surfactant are discharged into wastewater, and then accumulates and persists in sewage sludge, river sediments, estuaries and other environmental segments. The occurrence of nonylphenol in the environment is clearly correlated with human activities, such as wastewater treatment, land filling, and sewage sludge recycling. As such, nonylphenol has been found at high levels in marine animals that live in California estuaries, including those species raised for the human food supply such as oysters and mussels.

SLOSEA scientists have found high levels of NPs in the environment and in animals that live in estuaries in two areas of California - Morro Bay and Tomales Bay. Chemical analysis of liver tissue from 250 fish showed that average levels of nonylphenol reached 716 ppb. Moreover, nonylphenol was found in the human food supply: digestive tissue in oysters (363 ppb) and blue mussels (290 ppb) grown in Morro Bay.

SLOSEA Collaborative Partners

Cal Poly Center for Coastal Marine Sciences ~ California Bureau of Land Management ~ California Coastal Commission ~ California Coastal Conservancy ~ California Department of Fish & Game ~ California State Parks ~ Central Coast Regional Water Quality Control Board ~ Coastal San Luis Resource Conservation District ~ Los Osos Community Advisory Council ~ City of Morro Bay ~ Marine Interests Group of San Luis Obispo County ~ Monterey Bay National Marine Sanctuary ~ Morro Bay National Estuary Program ~ NOAA Fisheries Service ~ Port San Luis Harbor District

SLOSEA Involvement

SLOSEA has developed a state-of-the-art water quality monitoring system and pollution analysis techniques (including proteomics) to evaluate the health of the estuary and nearshore habitats. Over the last four years, we have evaluated pollution indicator organisms and real-time monitoring data to assess ecosystem health. Addressing pollutant sources and impacts is one of six key strategies SLOSEA has developed to improve ecosystem health.

Recommended Management Actions

1. Designated beneficial uses of local water bodies have been disrupted by the presence of nonylphenol. As such, the Central Coast Regional Water Quality Control has the authority to list Morro Bay and Chorro Creek on the Clean Water Act 303(d) list of contaminated water bodies for nonylphenol contamination. This listing will trigger management and use regulations, such as TMDLs and monitoring of nonylphenol within the environment.
2. The State Water Resources Control Board, in coordination with the Southern California Coastal Water Resource Project, has set forth a review of contaminants of emerging concern, including NP. Using the information and expertise gained from this process, the Board should set forth regulatory measures meant to significantly reduce the discharge of these chemicals into California water bodies, including a 303(d) listing, setting TMDLs, and creating a complete ban of nonylphenol surfactants.
3. The US EPA has established a Nonylphenol Action Plan. This plan should be updated to:
 - Move from a voluntary phase-out to a mandatory phase-out of NP and NPEs, leading to a complete ban of these chemicals.
 - Immediately initiate rulemaking to add NP and NPEs to the Concern List of chemicals that present or may present an unreasonable risk of injury to health or the environment.
 - Immediately initiate rulemaking to add NP and NPEs to the Toxics Release Inventory (TRI), which would require facilities to report releases of these chemicals into the environment.
4. The US EPA, Cal EPA, and SLO County should require all new and upgraded Publically Owned Treatment Works (POTWs) to employ processing measures that ensure NP and NPE will not be released into the environment.

Resources:

Nonylphenol and Nonylphenol Ethoxylates Action Plan Summary. US EPA. August 2010.
Available at: <http://www.epa.gov/oppt/existingchemicals/pubs/actionplans/np-npe.html>

Toxicological Profile for Nonylphenol: Integrated Risk Assessment Branch Office of Environmental Health Hazard Assessment, California Environmental Protection Agency. 2010.

Ubiquitous distribution of 4-NP in west coast estuaries. Diehl et al. August 2010. Unpublished manuscript. Available by request.

SLOSEA Collaborative Partners

Cal Poly Center for Coastal Marine Sciences ~ California Bureau of Land Management ~ California Coastal Commission ~ California Coastal Conservancy ~ California Department of Fish & Game ~ California State Parks ~ Central Coast Regional Water Quality Control Board ~ Coastal San Luis Resource Conservation District ~ Los Osos Community Advisory Council ~ City of Morro Bay ~ Marine Interests Group of San Luis Obispo County ~ Monterey Bay National Marine Sanctuary ~ Morro Bay National Estuary Program ~ NOAA Fisheries Service ~ Port San Luis Harbor District