

# A P E R E S E A R C H C O U N C I L

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## For Immediate Release

### APERC Statement on BP Response to EPA Regarding Dispersants

**May 25, 2010** - The Alkylphenols & Ethoxylates Research Council (APERC) is keeping all of those affected by the Deepwater Horizon disaster and oil spill in the Gulf of Mexico in our thoughts as we hope for rapid success in the enormous effort underway to contain the oil release. Some of our member companies have facilities and employees in the areas likely to be affected and are supporting the cleanup efforts. This release of crude oil is of a scale never before experienced in this country; therefore, predicting the range of environmental effects from the release itself and from the recovery efforts will be difficult. Considering the potential impact, APERC supports the use of the most effective containment efforts with consideration of their immediate and long term environmental impact.

In a response letter to US EPA regarding the Agency's May 19, 2010 Addendum 2 to the Dispersant Monitoring and Assessment Directive, BP raised concerns about the potential degradation of a dispersant ingredient to nonylphenol (NP). For more than twenty years, APERC and its member companies have been actively engaged in toxicological and environmental fate and effects research on NP and its derivative compounds. Consequently, APERC can contribute considerable information and expertise relevant to the environmental assessment of these substances. As such, we would like to address some inaccuracies in some of BP's statements about NP and nonylphenol ethoxylates (NPEs).

BP states in their letter to US EPA that one dispersant product "*contains a small amount of a chemical that may degrade to a nonylphenol (NP). The class of NP chemicals have been identified by various governmental agencies as potential endocrine disruptors, and as chemicals that may persist in the environment for a period of years.*" In addition, after noting that US EPA has developed final acute and chronic marine Water Quality Criteria (WQC) for NP, BP states "*If a dispersant with NPE levels comparable to those of [ ] is used on the spill, the acute criteria may be temporarily exceeded shortly after application...*" and "*Exceedances of the chronic criteria appear unlikely, but could occur if [ ] is applied in the same area over a period of several days.*"

The following is provided to clarify some inaccuracies in BP's statements about NP and NPEs and to inform environmental assessments of dispersants that might contain NPEs.

**1. NP and NPEs are not the same compound and do not have the same ecotoxicity profiles.**

NP is a biodegradation intermediate that can form during the environmental breakdown of NPEs. NPEs are surfactants used in commercial products. As with all surfactants, NPEs can be toxic to aquatic life; however NPEs are significantly less toxic to aquatic organisms than NP. NP is weakly estrogenic with a potency that is ten thousand to one million times less potent than natural estrogen. More importantly, commercial NPEs are not estrogenically active.<sup>1 2 3</sup>

NPEs are typically used in applications that result in their treatment in wastewater treatment plants prior to introduction in the aquatic environment.

**2. US EPA finalized Water Quality Criteria (WQC) for NP that are protective of short and long term exposures to aquatic organisms but are not applicable to NPE.**

US EPA established WQC for NP in 2006. WQC are surface water concentrations that, when met, will protect aquatic life. The US EPA WQC for NP reflect recent scientific information about the ecological effects of this compound available through 2005. A review of the literature since that time continues to support the US EPA WQC.<sup>4</sup> Across all aquatic organisms, the weight-of-evidence shows that commercial NPEs (*i.e.*, NPE9) are much less toxic than NP.<sup>5,6</sup> Therefore, the US EPA WQC for NP should not be applied directly to NPEs.

**3. Estrogenicity is a mechanism of action – not an adverse effect - and US EPA’s WQC for NP account and protect for adverse effects (e.g., reproductive and developmental) that might result from the weak estrogenic activity of this compound.**

US EPA developed the WQC for NP based on aquatic toxicity studies that measure adverse effects, such as growth, survival, and reproduction, which affect species at the

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<sup>1</sup> Dussault, E.B., Sherry, J.P., Lee, H.B., Burnison, B.K., Bennie, D.T., & Servos, M.R. (2005). In vivo estrogenicity of nonylphenol and its ethoxylates in the Canadian environment. Human and Ecological Risk Assessment, 11 (2), 353–364.

<sup>2</sup> Metcalfe CD, Metcalfe TL, Kiparissis Y, et al. (2001). Estrogenic potency of chemicals detected in sewage treatment plant effluents as determined by in vivo assays with Japanese medaka (*Oryzias latipes*). Environ Toxicol Chem 20: 297-308

<sup>3</sup> Balch, G., & Metcalfe, G. (2006). Developmental effects in Japanese medaka (*Oryzias latipes*) exposed to nonylphenol ethoxylates and their degradation products. Chemosphere, 62, 1214-1223.

<sup>4</sup> Coady, K., Staples, C. Losey, B., and Klecka, G. (2009). A Hazard Assessment of Aggregate Exposure to Nonylphenol and Nonylphenol Mono- and Di-ethoxylates in the Aquatic Environment. Human and Ecological Risk Assessment. In press

<sup>5</sup> Staples, C.A., Weeks, J., Hall, J.F., & Naylor, C.G. (1998). Evaluation of aquatic toxicity and bioaccumulation of C8- and C9-alkylphenol ethoxylates. Environmental Toxicology and Chemistry, 17, 2470-2480.

<sup>6</sup> Staples, C., Mihaich, E., Carbone, J., Woodburn, K., & Klečka, G. (2004). A weight of evidence analysis of the chronic ecotoxicity of nonylphenol ethoxylates, nonylphenol ether carboxylates, and nonylphenol. Human and Ecological Risk Assessment, 10 (6), 999-1017.

population level. Other studies have been conducted on NP and NPE that examine secondary endpoints, such as changes in gene expression, biochemistry, and tissues. These secondary endpoint studies are focused on eliciting information about the estrogenic mode of action of a compound rather than measuring adverse effects.

#### **4. Nonylphenol and Nonylphenol Ethoxylates are neither persistent nor bioaccumulative.**

Governmental assessments of the persistence of NP and NPE have concluded that they do not meet various criteria for classification as a persistent.<sup>7 8 9 10 11</sup> The degradation half-lives for NP and NPE range from 5.8 to 30 days.

These same governmental assessments also concluded that NP and NPE are not bioaccumulative. In fact, they are readily metabolized and excreted in both aquatic species and mammals.

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*The mission of the APE Research Council, which is composed of manufacturers, processors and raw material suppliers of alkylphenols (AP) and alkylphenol derivatives (e.g., alkylphenol ethoxylates (APE)), is to promote the safe use of AP and AP derivatives through research, product stewardship and outreach efforts, within the framework of responsible chemical management. For more information about AP and APE go to [www.aperc.org](http://www.aperc.org).*

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<sup>7</sup> Environment Canada and Health Canada (EC and HC). (2001). Priority substances list assessment report for nonylphenol and its ethoxylates. ISBN: 0-662-29248-0. <http://www.hc-sc.gc.ca/ewh-semt/pubs/contaminants/psl2-lsp2/nonylphenol/index-eng.php>.

<sup>8</sup> European Chemicals Bureau (ECB). (2003). PBT Working Group Substance Information Sheets for Nonylphenol (CAS 25154-52-3) and Phenol, 4-Nonyl, branched (CAS 84852-15-3).

<sup>9</sup> Environment Canada (EC). (2007). Ecological categorization of substances on the Domestic Substance List; Categorization Decisions. (Completed in September 2006). [http://www.ec.gc.ca/substances/ese/eng/dsl/cat\\_index.cfm](http://www.ec.gc.ca/substances/ese/eng/dsl/cat_index.cfm).

<sup>10</sup> US Environmental Protection Agency (EPA). (2005). Aquatic Life Ambient Water Quality Criteria - Nonylphenol. Report 822-R-05-005. US Environmental Protection Agency, Washington, DC, USA.

<sup>11</sup> Washington State Department of Ecology (2006, January) Rule Adoption Notice: Persistent Bioaccumulative Toxins Chapter 173-333 WAC. <http://www.ecy.wa.gov/biblio/0607007.html>