

**Comments
of the
Alkylphenols & Ethoxylates Research Council
on the
Oregon Department of Environmental Quality
Interim Final Priority Persistent Pollutant List (P³L)
(June 1, 2009)**

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Introduction

The Alkylphenols & Ethoxylates Research Council (APERC) is pleased to submit these comments on the Oregon Department of Environmental Quality (DEQ) Interim Final Priority Persistent Pollutant List (P³L) and Report: Senate Bill 737: Development of a Priority Persistent Pollutant (P³) List for Oregon (June 1, 2009).¹ APERC is comprised of major North American producers of alkylphenols (APs) including octylphenol, 4-tert-(4-tOP) (CASRN 140-66-9) and di-tert-butylphenol, 2, 6- (2,6-dtBT) (CASRN 128-39-2), which are listed as “under review” in Tier III of the Interim Final P³L. For more than twenty years APERC, previously called the Alkylphenols and Ethoxylates Panel, and its member companies have been actively engaged in toxicological and environmental fate and effects research on APs and their derivative compounds.² Consequently, APERC can contribute considerable information and expertise to the environmental and toxicological assessment of these substances.

Oregon Senate Bill 737 was enacted under the premise that “persistent, bioaccumulative and toxic pollutants can pose a threat to the health and well-being of humans, fish and wildlife, especially aquatic species.”³ When enacted in June 2007, this bill directed DEQ to conduct “a study of persistent pollutants discharged in the State of Oregon and report the results of that study to an appropriate interim committee of the Legislative Assembly related to the environment by June 1, 2010.” ‘Persistent pollutant’ is defined in the Act as “a substance that is toxic and either persists in the environment or accumulates in the tissues of humans, fish, wildlife or plants.”⁴

APERC still has the following concerns, which are described in more detail in previous comments,⁵ regarding the process and approach used by DEQ to develop the P³L:

- The lack of transparency and lack of opportunity for public comment on the activities of the DEQ and the Persistent Pollutant Science Workgroup during the process of developing the P³L;

¹ Oregon Department of Environmental Quality (DEQ). (2009, June). Senate Bill 737: Development of a Priority Persistent Pollutant List (P³L) for Oregon. <http://www.deq.state.or.us/wq/SB737/docs/P3LreplinterimF.pdf>.

² Members of the Alkylphenols & Ethoxylates Research Council include: Dover Chemical Corporation, SI Group, Texas Petrochemicals, Inc. and The Dow Chemical Company.

³ 74th Oregon Legislative Assembly. (2007). Senate Bill 737. <http://www.leg.state.or.us/07reg/measures/sb0700.dir/sb0737.en.html>

⁴ 74th Oregon Legislative Assembly. (2007).

⁵ Alkylphenols & Ethoxylates Research Council. (2009, March 27). Comments of the Alkylphenols & Ethoxylates Research Council on the Oregon Department of Environmental Quality Draft Development of a Priority Persistent Pollutant List (P³L) for Oregon (March 2, 2009).

- The reliance on models when adequate data are available to develop the P³L;
- The criteria to score and prioritize candidate compounds for inclusion on the P³L were developed arbitrarily by DEQ without stakeholder input; and,
- The definition of “persistent” in the report is inconsistent with other nationally and internationally recognized definitions of persistent, bioaccumulative and toxic (PBT) chemicals and persistent organic pollutants (POPs); though DEQ acknowledges this fact in the June 1 Report.⁶

APERC submits the following specific comments to explain why 4-tOP and 2,6-dtBT should be removed from the P³L.

I. 4-tOP DOES NOT MEET THE PERSISTENCE CRITERIA IN THE DEQ REPORT ON DEVELOPMENT OF A P³L FOR OREGON; THEREFORE IT SHOULD BE REMOVED FROM THE P³L

Comprehensive and scientifically defensible assessments by governmental authorities have concluded that 4-tOP (CASRN 140-66-9), is not persistent and not bioaccumulative; therefore, categorization of this compound otherwise by DEQ is inconsistent with its status at international and national levels. Review of the data available for 4-tOP supports reduction in the P³L score for persistence for 4-tOP as well as its removal from the P³L based on the criteria listed in the DEQ Report.

Governmental assessments have already evaluated 4-tOP and concluded that it does not meet various criteria for classification as a persistent or bioaccumulative compound.^{7,8} More recently, Environment Canada completed a review of OP as part of a categorization assessment under the Canadian Environmental Protection Act (CEPA), which required an assessment of all substances on the Canadian Domestic Substances List (DSL) with respect to persistence, bioaccumulation and inherent toxicity (PBiT) characteristics. Attached is an Environment Canada document that summarizes the basis behind the following conclusion regarding octylphenol as well as other alkylphenol compounds.⁹

Based on the availability of ready biodegradability data provided by APERC to support evaluation of some of these substances on the DSL, estimated environmental half-lives for water and soil are in the range of 5 to 30 days, which are below the criteria that Environment Canada has defined for categorization of substances on the DSL (Water, Soil t_{1/2} < 182 days). This conclusion is supported by additional results of numerous simulation tests conducted with representative members of the family of NP, OP, and the ethoxylates. (emphasis added)

⁶ Oregon Department of Environmental Quality (DEQ). (2009, June).

⁷ Environment Canada (EC). (2007). Ecological Categorization of Substances on the Domestic Substance List (DSL); Categorization Decisions. (Completed in September 2006). http://www.ec.gc.ca/substances/ese/eng/dsl/cat_index.cfm.

⁸ UK Environment Agency. (2005). Environmental Risk Evaluation Report: 4-tert-Octylphenol.

⁹ Environment Canada (EC). (2005, November 21). Response to APERC’s Proposal Regarding Environment Canada’s Preliminary Categorization of Nonylphenol, Octylphenol and their Ethoxylates.

Numerous laboratory and field studies on the persistence and bioaccumulative properties of 4-tOP are referenced in these governmental assessments and are available to DEQ. Half-lives for 4-tOP are summarized on page 5 of the Environment Canada (2005, November 21) decision document in Table 3: Revised Categorization Decisions on Persistence for NP/NPE and OP/OPE. The detailed assessment of the persistence and bioaccumulative properties of 4-tOP submitted by APERC to Environment Canada are also attached for DEQ's reference.¹⁰ Studies reporting half-lives for 4-tOP are reported in the APERC submission on page 35 in Table 2: Summary of the Ready Biodegradability of APE and AP Substances as well as on page 36 in Table 3: Summary of Biodegradation Half-lives from Ready Tests, Laboratory Simulation Data, and Field Studies (All Media) for Studies that Used Commercially Relevant (Branched) Test Materials. In addition, attached is a pair of companion manuscripts published in a peer-reviewed journal by Staples et al. (2008) and Klecka et al. (2008) that summarize the weight-of-evidence and provide references to the existing available data on the persistence and bioaccumulative properties of octylphenol.^{11,12}

A review of the environmental half-lives for 4-tOP in the categorization and screening assessment by Environment Canada, as well as the two peer-reviewed weight-of-evidence papers, show that the results for 4-tOP fall below DEQ's 60 days threshold for persistence (none to low). This supports a reduction in the persistence score for 4-tOP in the P³L from 1 to 0. A review of the bioconcentration and bioaccumulation factors for 4-tOP in all of the attached documents shows that the majority fall below 1000, supporting the current bioaccumulation score of 0 for this compound in the P³L. The reduction in the persistence score for 4-tOP reduces the aggregate P³L aquatic scores for this compound from 3 to 2, which supports its removal from the P³L list.

II. 2,6-dtBT SHOULD BE REMOVED FROM THE P³L BECAUSE IT IS A PROCESS INTERMEDIARY THAT IS UNLIKELY TO BE USED OR DISCHARGED IN SIGNIFICANT AMOUNTS - IF AT ALL - IN OREGON WATERS

The Report notes that DEQ deleted 200 chemicals from the draft P³L during its development based on the fact that they "are industrial or process intermediary chemicals unlikely to be used or discharged in any significant amounts, if at all, in Oregon."¹³ This rationale also supports the removal of 2, 6-di-tert-butylphenol (CASRN 128-39-2) from the P³L.

¹⁰ Klecka, G.M., Staples, C.A., Losey, B.S., & Woodburn, K.B. (2005, September 16). Assessment of the Persistence and Bioaccumulation Potential for Nonylphenol, Octylphenol and Their Ethoxylates for Categorization and Screening of the Canadian Domestic Substance List (DSL). Prepared for the Alkylphenols & Ethoxylates Research Council. Submitted to Environment Canada.

¹¹ Staples, C.A., Klecka, G.M., Naylor, C.G., & Losey, B.S. (2008). C8- and C9-Alkylphenols and Ethoxylates: I. Identity, Physical Characterization, and Biodegradation Pathways Analysis. Human and Ecological Risk Assessment, 14 (5), 1007–1024.

¹² Klecka, G.M., Staples, C.A., Naylor, C.G., Woodburn, K.B., & Losey, B.S. (2008). C8- and C9-Alkylphenols and Ethoxylates: II. Assessment of Environmental Persistence and Bioaccumulation Potential. Human and Ecological Risk Assessment, 14 (5), 1025–1055.

¹³ Oregon Department of Environmental Quality (DEQ). (2009, June).

The use of 2,6-dtBT is as a process intermediary that is unlikely to be used or discharged in any significant amounts - if at all - in Oregon; therefore it should be removed from the P³L. Following is an excerpt from the Screening Information Data Set (SIDS) that was compiled by the Organisation for Economic Co-operation and Development (OECD) summarizing the use and release of this compound.¹⁴

The quantities released into the environment are expected to be small. The main part of the production volume is used as an intermediate for the synthesis of other substances. In the United States the percentage of 2,6-DTBP used as a synthetic intermediate for the production of higher molecular weight phenolic antioxidants was reported to be between 75 and 95 %. According to informations received from the Swiss manufacturer, 95-100% of the quantity produced in Switzerland are used as an intermediate.

At the production site in Switzerland, only very small quantities of 2,6-DTBP are emitted into air and water. Reaction gases and residues are incinerated. There is no direct release into the water. Waste water samples are analysed daily and the monitoring data show the concentration to be below the detection limit of 0.01 mg/L....

The highest concentrations of 2,6-DTBP, therefore, are expected to occur near the production site. The concentration of the substance in the water leaving the production site in Switzerland is analysed daily, and the water authorities are provided with the results. The waste water is then lead into a waste water treatment plant.

Monitoring data show the concentration of 2,6-di-tert-butylphenol entering the waste water treatment plant to be lower than the detection limit of 0.01 mg/L.

It is APERC's understanding that greater than 90% of current uses of 2,6-dtBT in the United States is as a synthetic intermediate for the production of higher molecular weight phenolic antioxidants. In addition, APERC and its member companies are not aware of any companies in Oregon that are purchasing 2,6-dtBT (CASRN 128-39-2) for processing; therefore, it is highly unlikely that it will be used or discharged in any significant amounts - if at all - in Oregon. 2,6-dtBT (CASRN 128-39-2) should be removed from the P³L.

¹⁴ Organisation for Economic Co-operation and Development (OECD). (1995, September). Screening Information DataSet (SIDS). 2,6-di-tert-butylphenol CAS N° 128-39-2. UNEP Publications.
<http://www.inchem.org/documents/sids/sids/128392.pdf> .