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Perfluorinated compounds: Avoid inputs – protect the environment

Federal Environment Agency proposes threshold values for the sake of environment and health

The reports about perfluorinated compounds (PFCs) in the environment keep coming and coming. Recent occurrences of these compounds in wastewater treatment plants, bodies of water, in drinking water, in indoor air, and in human blood in particular have kept public debate lively. Although toxicologically critical concentrations have only occurred in a few incidents, “perfluorinated compounds in the environment, drinking water, and blood are cause for concern, not least because they are often found in locations quite remote from the products treated with perfluorinated chemicals. These xenobiotics clearly do not belong in the environment and much less in human blood,” commented Dr. Thomas Holzmann, Vice President of the Federal Environment Agency (UBA) upon the publication of the *Perfluorierte Verbindungen: Einträge vermeiden - Umwelt schützen* [Perfluorinated compounds: avoid inputs – protect the environment] document. As concerns protection of human health, UBA and the Drinking Water Commission (TWK) recommend compliance with an acceptable lifetime drinking water guideline value of 0.3 microgrammes PFC per litre of water. The experts propose a maximum annual mean value of 0.1 microgrammes PFC per litre.

On account of their water, stain, and grease-resistant properties, a number of different PFCs are used in clothing and other textiles, cooking utensils, paper, and many other consumer products. New studies have shown that PFCs can be released from consumer products and inhaled. The human body converts these precursor compounds into persistent PFCs. Perfluorinated compounds from various sources have been traced worldwide in human blood, are excreted only very slowly and thus accumulate over time. PFOS, a pervasive PFC, has recently been added to the "black list" of the [Stockholm Convention on Persistent Organic Pollutants](#) (POPs).

PFCs enter into water treatment plants in household and industry wastewater and effluent. Since most PFCs are very stable in chemical terms, they do not degrade. Water-soluble PFCs are thus introduced into rivers, lakes and oceans. PFCs also accumulate in sewage sludge, and if this sludge is used in agriculture, perfluorinated compounds can also enter soils, surface and groundwater.

There was proof that PFCs are introduced into human drinking water supply in this fashion at the Möhne Reservoir in North Rhine-Westphalia in 2006. Farmers had applied soil conditioners in the vicinity of this reservoir which—unknown to them— contained high levels of PFCs in sludge labelled as a biowaste mixture. As a result, PFCs entered the drinking water supply system—and into the population's bloodstream. Although this was an isolated case, it is an example of the challenges facing the use of sewage sludge in agriculture: since sewage sludge is generally considered a pollutant sink, there is a risk that even compliance with current limit values and other constraints might not stop new, as yet unknown and therefore non-regulated substances, from entering water and soils.

In order to get to the root of the problem with the properties of PFCs, UBA proposes that legally binding quality standards and reduction targets applicable to bodies of water, wastewater, and soils be introduced. The Use of Fertilisers Ordinance (*Düngemittelverordnung*) has already set a threshold value of 100 microgrammes/kg dry substance. In addition, legislation such as the Waste Water Ordinance (*Abwasserverordnung*) and the Sewage Sludge Ordinance (*Klärschlammverordnung*) should establish harmonised PFC threshold values. As concerns industrial processes, in the textiles and paper industries for example, the UBA is calling for closed water cycles. Furthermore, the appropriate *Laender* authorities ought to conduct regular tests for presence of PFCs in bodies of water, wastewater, and sewage sludges. Consumers should consider carefully whether stain, oil, and water-resistant properties are actually necessary in the products such as textiles that they use daily. "We are confronted with perfluorinated compounds all the time, and the benefits gained from fluorinated chemistry can not be denied. Yet, as always, we must bear in mind that less is sometimes more, and that untreated household products and textiles are more than adequate", said UBA Vice President Holzmann.

The new background paper, *Perfluorierte Verbindungen: Einträge vermeiden - Umwelt schützen* [Perfluorinated compounds: Avoid inputs - protect the environment], can be downloaded free of charge: <http://www.umweltdaten.de/publikationen/fpdf-l/3818.pdf>.

The Drinking Water Commission is a national expert body of the German Federal Ministry of Health (*Bundesministerium für Gesundheit - BMG*) within the Federal Environment Agency (*UBA*). The Commission advises both public offices on issues of drinking water hygiene. The Ministry of Health, together with the Federal Ministry for Environment, Nature Conservation and Nuclear Safety (*BMU*) and supreme environmental authorities in the *Laender* authorities, appoints Commission members to take office for a period of three years: <http://www.umweltbundesamt.de/wasser-e/themen/drinking-water/trinkwasserkommission.htm>.

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