

## **HELCOM RECOMMENDATION 28E/6**

Adopted 15 November 2007  
having regard to Article 20, Paragraph 1 b)  
of the Helsinki Convention

### **ON-SITE WASTEWATER TREATMENT OF SINGLE FAMILY HOMES, SMALL BUSINESSES AND SETTLEMENTS UP TO 300 PERSON EQUIVALENTS (P.E.)**

#### **THE COMMISSION,**

**RECALLING** Paragraph 1 of Article 6 of the Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992 (Helsinki Convention), in which the Contracting Parties undertake to prevent and eliminate pollution of the Baltic Sea Area from land-based sources by using, inter alia, Best Environmental Practice for all sources and Best Available Technology for point sources,

**HAVING REGARD** to Article 3 of the Helsinki Convention, in which the Contracting Parties shall individually or jointly take all appropriate legislative, administrative or the relevant measures to prevent and abate pollution in order to promote the ecological restoration of the Baltic Sea Area,

**RECALLING** the Ministerial Declaration of 1988 and the Baltic Sea Declaration of 1990, calling, inter alia, for a substantial reduction of the inputs caused by diffuse sources,

**RECALLING FURTHER** HELCOM Recommendation 9/2 in which the use of effective methods of wastewater treatment is stressed,

**RECOGNISING** the fact that a substantial part of the eutrophication problems observed in the Baltic Sea Area is caused by nutrient inputs from diffuse sources,

**RECOGNISING** that wastewater discharges originating from sources outside urban wastewater collection systems, such as single family homes, small businesses and settlements are a land-based source from which considerable quantities of nutrients are likely to reach, directly or indirectly, the marine area,

**TAKING INTO ACCOUNT** that stricter requirements for on-site wastewater treatment outside sewer networks are likely to enhance water quality also in local water bodies and shallow wells used for extraction of drinking water,

**NOTING** that for the purpose of this Recommendation the following definitions apply:

Grey water: Non-industrial wastewater generated in domestic processes, excluding human excrements, such as washing dishes, laundry and bathing

Black water: Domestic wastewater containing human excrements

Composting dry toilet: A toilet system without water flush used for disposal of and biological processing of human excrement into organic compost material.

**NOTING** that the objective of this Recommendation is to reduce domestic and other wastewater discharges from sources outside urban wastewater collection systems,

**NOTING FURTHER** that this Recommendation covers those on-site wastewater systems which receive domestic or similar wastewater from single family homes, small businesses or settlements outside urban wastewater collection systems,

**RECOMMENDS** to the Governments of the Contracting States that the following practices should be promoted in on-site wastewater treatment for single family homes, small businesses and settlements up to 300 p.e.:

1. Untreated wastewaters shall not be led directly to natural water systems in areas that are not connected to sewers.
2. Wastewaters from single family homes, small businesses and settlements should be treated so that emissions per capita to the environment reach at most the values set in Table 1.

For a high standard household with warm water, showers, laundry and dishwashing machines and flush toilets this would mean approximately a basic reduction of 80% of BOD<sub>5</sub>, 70% of total phosphorus and 29% of total nitrogen.

<b>Table 1. Maximum permissible daily load per capita for biological oxygen demand over five days (BOD<sub>5</sub>), total phosphorus (P<sub>tot</sub>) and total nitrogen (N<sub>tot</sub>) of the treated wastewater.</b>	
<b>Load parameter</b>	<b>Permissible load of treated wastewater (g person<sup>-1</sup> d<sup>-1</sup>)*</b>
BOD <sub>5</sub>	8
P <sub>tot</sub>	0.65
N <sub>tot</sub>	10

\*g person<sup>-1</sup> d<sup>-1</sup> is grams per person per day

*Alternative 1:* the requirements based on emissions per capita need not apply where it can be shown that an on-site wastewater treatment plant results in at most a concentration of BOD<sub>5</sub> of 20 mg/l, P<sub>tot</sub> 5 mg/l and N<sub>tot</sub> 25 mg/l in the effluent of the treatment plant.

*Alternative 2:* the requirements based on emissions per capita need not apply where it can be shown that an on-site wastewater treatment plant using the Best Available Technology (BAT) is installed and operated so that the treatment results in at most a concentration of BOD<sub>5</sub> of 40 mg/l and 150 mg/l COD in the effluent of the treatment plant.

*Alternative 3:*

Mapping

Improved treatment shall be introduced in areas where the quality of the waterbody is below the desired quality, when – and only when - it can shown that that the quality of the waterbody is poorer due to the influence of discharged wastewater.

Treatment

Improved wastewater treatment must be introduced when a house not connected to public sewer is situated in an area where the aforementioned conditions are present. The following table shows different levels of treatment, depending on the sensitivity of the waterbody:

<b>Receiving water sensitivity</b>	<b>Treatment type</b>	<b>BOD<sub>5</sub> reduction (%)</b>	<b>Phosphorus reduction (%)</b>	<b>Nitrification (%)</b>
Class 1	Enhanced OP treatment	95	90	90
Class 2	Enhanced O treatment	95		90
Class 3	OP treatment	90	90	
Class 4	O treatment	90		

O: organic matter

P: phosphorus. (P-reduction achieved in effluent)

Nitrification: chemical process transforming ammonium-nitrogen (NH<sub>4</sub>-N) into nitrate (NO<sub>3</sub>-N).

3. The two possible phases of minimisation of the discharges of wastewater to the environment are

- the use of dry toilets, phosphate-free detergents and minimisation of water consumption;
- Treatment of wastewater. The level of the treatment depends on the composition of the wastewater; black water needs a higher level of treatment than grey water.

Examples of wastewater generation and treatment options:

- Composting dry toilet with separation of urine in combination with on-site grey water treatment.
- Composting dry toilet in combination with on-site grey water treatment.
- Separation of grey water and black water, on-site treatment of grey water in combination with storage and transportation of black water to the municipal wastewater treatment plant for treatment.
- An on-site wastewater treatment system for all wastewaters.
- An on-site holding tank or cesspool with transportation to and treatment of wastewaters at a municipal wastewater treatment plant.

Drainage and storm waters should never be led to a wastewater treatment system.

For estimates of needed reduction levels for two different combinations of wastewater generation and treatment, see attachment.

4. Attention should be paid to reducing sludge formation and to promoting systems which enable recycling of nutrients back to agricultural use. Sludge should be collected, stored and transported to a municipal wastewater treatment plant or a designated sludge handling unit in manner that avoids leakages. Sludge from septic tanks or activated sludge systems should not be dumped into waterbodies or close to them.

5. A transitional period of 10 years for the households (with water flush toilets and 14 years without water flush toilets) to implement the Recommendation from the date of adoption should be applied,

**RECOMMENDS FURTHER** that the Contracting Parties report on the implementation of the Recommendation to the Commission, based on reporting requirements developed by the Land-based Pollution Group.