



## HELCOM Recommendation 38/1

Adopted 1 March 2017  
having regard to Article 20, Paragraph 1 b)  
of the Helsinki Convention

### SEWAGE SLUDGE HANDLING

#### THE COMMISSION,

**RECALLING** 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,

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

**RECALLING** Article 5 of the Helsinki Convention, in which the Contracting Parties undertake to prevent and eliminate pollution of the marine environment of the Baltic Sea caused by harmful substances,

**RECOGNIZING** also the specific requirements for the prevention of pollution from land-based sources as laid down in Annex III of the Helsinki Convention,

**RECALLING ALSO** the Baltic Sea Action Plan (BSAP) adopted at the HELCOM Ministerial Meeting 2007 (Krakow) that calls for urgent actions to reduce the discharges of nutrients and hazardous substances to the Baltic Sea Area,

**RECALLING FURTHER** that the HELCOM Ministerial Meeting in 2010 (Moscow) and the high-level segment of the Helsinki Commission meeting in 2011 highlighted the need to improve resource efficiency and recycling of nutrients through utilization of sewage sludge,

**RECALLING AS WELL** that the 2013 HELCOM Ministerial Meeting called for further alignment with regard to the implementation of the ecosystem approach and sustainable use of nutrients, enhancement of phosphorus recycling (especially in agriculture and waste water treatment) and promoting development of appropriate methodologies;

**RECOGNISING** that phosphorus as a limited resource was included into the list of critical raw materials by the European Commission, thus underlining economically feasible recycling from sewage sludge as being of particular importance,

**ACKNOWLEDGING** existing national and international legislation and competences, criteria and guidance for sewage sludge handling, and, for those Contracting Parties being EU Member States, also other relevant EU legislation, aiming at preventing further degradation of the marine and freshwater environments and at achieving a healthy sea in good environmental/ecological/chemical status by 2020/2021;

**RECOGNISING FURTHER** the Circular Economy Package adopted by the European Commission on 2 December 2015, to increase recycling of waste;

**RECOGNISING ALSO** that sewage sludge may be a sink for unwanted and hazardous substances including new substances – and that sewage sludge, thus, can be harmful for plants, animals and humans, and that there is concern in contracting parties about this resource, and that reuse and disposal of sewage sludge shall not cause any harmful effects, including accumulation and interactions of harmful substances and its degradation products, on humans, animals, vegetation, soil and waters in either the short or longer term,

**RECOGNISING FURTHER** that addition of sewage sludge to agriculture may often have a positive effect on microorganisms in the soil, and that treatment of sewage sludge has found to be necessary before it is used in agriculture,

**RECOGNISING ALSO** that measures to reduce content of unwanted substances in incoming wastewater to wastewater treatment plants at the source are necessary in order to obtain i.e. the best possible quality of the sewage sludge,

**TAKING NOTE** of that recirculating sludge to agricultural land is a strong driving force raising awareness of the society on control of waste water quality at the source, resulting in both a better sludge quality and a better quality of the treated wastewater discharged into the environment,

**NOTING** that for the purpose of this Recommendation, the definition of sewage sludge should be the same as in the Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture,

**NOTING** that the waste management hierarchy set in the EU Waste Framework Directive 2008/98/EC is in principle applicable also for sewage sludge management and contains the following steps: prevention; preparing for re-use; recycling; energy recovery, and disposal,

**DESIRING** to recycle the nutrients, especially plant available phosphorus, in the sludge; to make use of its valuable properties and energetic potential and to dispose of it safely, efficiently and sustainably,

**RECOMMENDS** to the Contracting Parties to the Helsinki Convention to apply the Guidance (Annex 1) for sustainable sewage sludge handling in the Baltic Sea region,

**RECOMMENDS ALSO** that the Contracting Parties establish a program, or any other appropriate action or instrument, for the implementation of this Recommendation and that they provide the Helsinki Commission with the relevant information at the latest by 30 June 2017,

**RECOMMENDS** to the Contracting Parties to the Helsinki Convention to encourage development of innovative “green” power industry based on production of solid, liquid or gas fuel as a result of sewage sludge treatment processes;

**RECOMMENDS ALSO** to the Contracting Parties to promote research and development of the sustainable cost-effective solutions, especially for phosphorus recovery from the sewage sludge and products of its treatment.

**RECOMMENDS FURTHER** that the Contracting Parties report to the Helsinki Commission every three years starting at the end of 2019 with data from 2018 according to Annex 2.

**RECOMMENDS**, in parallel, to strive for further reduction of the content of unwanted substances in sewage sludge.

**RECOMMENDS** that the information on upstream measures, treatment processes of sewage sludge, quality of sewage sludge, existing national limit values and progress in implementing this recommendation will form a knowledge basis for reviewing and, if needed, updating of national legislation including limit values and assuring improved sewage sludge handling across the Baltic Sea region.

**DECIDES** to review this Recommendation no later than 2021, and thereafter as necessary, taking into account the implementation and review of the HELCOM Baltic Sea Action Plan as well as new developments on national or international and EU level for Member States.

## Guidelines for improved sewage sludge handling in the Baltic Sea region

This document provides guidelines for improved sewage sludge handling with the aim to ensure maximum effective managed use of valuable substances and energy potential, while ensuring that negative effects on human health and the environment caused by hazardous substances are minimized. Furthermore, these guidelines are supposed to facilitate international cooperation and promotion of economic incentives while aiming at limiting potential environmental impacts of sewage sludge. As application of untreated sewage sludge is not to be applied at any kind of land, the mentioning of the term of sewage sludge, in the context of this Recommendation always refers to treated sewage sludge which has undergone biological chemical or heat treatment, long term storage or any other appropriate process so as significantly to reduce its fermentability and the health hazards resulting from its use.

### **A Overall recommendations regarding sewage sludge handling**

1. Endeavour, when applying techniques and practices for handling of sewage sludge to ensure maximum recycling or recovery of phosphorus and other useful substances and compounds.
2. In the case when sewage sludge is used for mixing with other raw materials (organic material of plant or animal origin or clay, sand, etc.) to produce fertilizing materials, the amount of unwanted substances in the mixed product should not exceed the limits established by international, EU or national rules and legislation where available. The fact that sewage sludge may contain other regulated harmful substances should be taken into consideration, including potential cumulative effects, too, when determining the mixing ratio.
3. Landfilling of untreated sewage sludge should be avoided; in case of landfilling sewage sludge, it has to be pre-treated in accordance, for instance, with the regulations of Directive 1999/31/EC (landfill directive) for EU Member States, taking into account that sewage sludge may contain harmful substances not falling under this legislation and untreated sewage sludge may be a source of harmful emissions, may cause pollution of surface and ground water as well as pose a hygienic risk.
4. Ensure also that leaching of the nutrients to the environment as well as emissions and leakages of substances polluting the environment are prevented by appropriate safe temporary storage of the sewage sludge or products of sewage sludge treatment.
5. Ensure that possible negative impacts from sewage sludge handling processes should be avoided or minimized so as not to hinder the achievement of a good environmental/ecological/chemical status of the Baltic Sea, as agreed upon in the HELCOM BSAP and relevant national, EU and international legislation.
6. Reuse or recycling of nutrients, especially phosphorus, from the sewage sludge as well as utilisation of its energetic potential should also be considered in the perspective of designing new facilities or reconstruction of waste water treatment plants (WWTP). However, waste water treatment, sludge treatment and recycling of sludge should ideally be looked in the integrated manner
7. Incineration of sewage sludge is an alternative in comparison to where Contracting Parties consider the hazardous potential of sewage sludge even after treatment as being too high for application on land as fertilizer. In this case, phosphorus should be recovered from the incinerated material as far as viable technical solutions are available.
8. The principle of substituting environmentally problematic substances by less problematic substances should be applied to decrease, whenever possible, the loads entering the WWTP to ensure high quality of resulting sewage sludge and prevent release of pollutants to the aquatic environment.

9. Whenever possible, loads of pollutants, i.e. heavy metals, micro-pollutants and pharmaceuticals entering the WWTP should be decreased, *inter alia*, through mandatory pre-treatment of the waste water released into the sewage system.
10. If unwanted substances are identified, sufficient source control measures should be established by polluters. The responsible competent authorities and waste water operators should establish a plan on how to prevent the unwanted substances to enter the sewage network.
11. Techniques and practices of sewage sludge handling should prevent or, at least, minimize all kinds of emissions to the air, water and soil, in accordance with national, EU and international legislation. Gas produced via anaerobic sludge digestion should be collected and used for energy production, including production of traffic fuel.
12. An effective and transparent permitting and reporting system should be established in the cases when the application of sewage sludge or products containing sewage sludge needs permits.
13. International dialog and cooperation, exchange of scientific and knowledge experience up to transfer of especially new environmentally friendly technologies and practices, as well as information on concentration of the unwanted substances in the sludge, should be facilitated, , while considering comparable, possibly compatible harmonized action for the benefit of the Baltic Sea region including effective monitoring and control mechanisms.

## **B Overall principles regarding handling of sewage sludge**

1. Sewage sludge from other WWTPs than those for treatment of domestic waste water or sewage sludge from waste water which does not have similar composition as domestic waste water should not be applied on or used in soils, unless safe application is assured.
2. Avoid any sewage sludge application in drinking water protection areas in order to prevent contamination with harmful substances such as pathologic components, pharmaceuticals, endocrine disrupters and other anthropogenic micro-pollutants, unless otherwise provided in the national legislation.
3. Sewage sludge must not be applied on land during the cultivation of fruits and vegetables nor on land intended for cultivation of fruits and vegetables within one year before harvest.
4. Sewage sludge must not be applied on permanent grassland or crops which are used as animal feed and could be contaminated with pathogenic components and/or harmful substances, such as e.g. micro-pollutants, unless safe application is ensured by existing legislation.
5. Sewage sludge must not be applied on agriculturally or horticulturally used soils in nature reserves, nature benchmarks, national parks, protected parts of the landscape and other areas of special interest, or according to national legislation.
6. Sewage sludge must not be applied in wetlands, potential flooded areas, water protected zones or closer than 10 meters from water bodies or according to national legislation.

## **C Recommendations regarding agricultural and horticultural use**

1. Before sewage sludge is applied for the first time the soil has to be analyzed on, at least, the following parameters:
  - Heavy metals: Cd, Cu, Ni, Pb, Zn, Hg, Cr
  - Nutrients: P, N, K
  - pH and other parameter as required according to national, EU and international rules and legislation.
2. Analysis of the soil should be repeated whenever necessary or according to national legislation.
3. The application of sewage sludge on/in soil is prohibited if the soil analyses show that the content of the above listed parameters exceed, at least, one of the limit values established by existing legislation.
4. Sewage sludge or its products like other fertilizers should not be applied on soil if the phosphorus and nitrogen content in the soil is sufficient for crop cultivation.
5. On arable land used for growing feed or sugar beet, insofar as the sugar beet foliage is used as feed, it shall only be allowed to apply sewage sludge before sowing and with subsequent deep-turn tillage. On arable land used for growing silo and green maize, the sewage sludge must be worked into the soil before sowing.
6. If the sewage sludge is to be used in agriculture or horticulture, it has to be hygienized according to national legislation.
7. Representative samples should be taken from sewage sludge or the product containing sewage sludge that will be used on arable land, and analysis of the samples following national, EU and international existing legislation, should be made.
8. The application of sewage sludge or products containing sewage sludge on/in soil is prohibited, if the analysis shows that the concentration of heavy metals or other unwanted substances exceed the limit values established by existing legislation.
9. The quantity of sewage sludge should be regulated in such a way that the accumulation of unwanted substances are limited by the following parameters:
  - the average amount of five tons dry sewage sludge added per hectare in three years or according to existing legislation;
  - the limit values for the particular substances according to existing rules and legislation;
  - exemptions from existing legislation should be possible, if a lack of special nutrients, e.g. copper or zinc, is proven in the soil. Contracting Parties may also decide to set stricter limits or to ban the use of sewage sludge in agriculture, horticulture and home gardening, if they consider the hazardous potential of sewage sludge as too high.

## **D Recommendations regarding use in forestry, green areas, landscaping and land reclamation**

1. Application of sewage sludge or mixed products containing sewage sludge at the lands used for forestry is in accordance with national legislation.
2. The sewage sludge or mixed products containing sewage sludge can be used in construction and maintaining urban green areas, landscaping including rail and road slopes as well as other elements of road infrastructure to prevent their erosion and land reclamation, if concentration of unwanted substances in the applied materials do not exceed limit values established by existing legislation for these types of land.
3. If the sewage sludge is to be used in landscaping, land reclamation and green areas it has to be hygienized to assure that no problematic pathogens exist in the product and it satisfies the same criteria as item C6.
4. Other recommendations regarding using sewage sludge or sewage sludge products for green areas, landscaping and land reclamation are a matter of the competent authority.

## **E Recommendations regarding incineration, construction and other applications**

1. If sewage sludge is to be incinerated phosphorus should be removed either prior to incineration or recovered from the ashes afterwards, if technically and economically feasible, and the produced energy has to be collected and used.
2. If it is not possible to remove phosphorus from the sludge or ashes directly, and the content of phosphorus is considerably high, the ashes could be stored temporarily in mono-landfills or mono-sections to remove phosphorus later when viable techniques are available. The use of best available techniques and best environmental practices for mono-landfills should be applied.
3. If sewage sludge or the ash after incineration of the sludge is used as a part of construction material e.g. additive for pavement, ceramic tile, border stone, building mixes etc. for industry, valuable substances, especially phosphorus, should be recovered from the sewage sludge or the ash before application when viable techniques are available, if the substances are not needed in the construction material and are lost for further reuse.

## Reporting Format for HELCOM Recommendation 38/1 on Sewage Sludge Handling

| REPORTING FORMAT FOR HELCOM Recommendation CONCERNING SEWAGE SLUDGE HANDLING                                                                                  |                       |                         |                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------|----------------------------|
| Lead Country:                                                                                                                                                 |                       |                         |                            |
| Country:                                                                                                                                                      |                       | Year:                   |                            |
| <b>A. Waste water from origins</b>                                                                                                                            |                       |                         |                            |
| 1. Have actions been taken to improve the waste water quality from origins before it reach WWTP (source reduction)?                                           | Yes                   | No                      | Unknown/ comments          |
| 2. Is improved waste water quality from origins a matter for the central, regional or local governments?                                                      | Yes                   | No                      | Unknown/ comments          |
| <b>B. Sewage sludge handling</b>                                                                                                                              |                       |                         |                            |
| 1. Generated sewage sludge, dry mass, t/a                                                                                                                     |                       |                         |                            |
| 2. Used for biogas generation dry mass, t/a                                                                                                                   |                       |                         |                            |
| 3. Usage of sewage sludge:                                                                                                                                    | Amount, dry mass, t/a | Number of installations |                            |
| a) incineration, co-combustion                                                                                                                                |                       |                         |                            |
| b) incineration, mono                                                                                                                                         |                       |                         |                            |
| c) landfilling                                                                                                                                                |                       |                         |                            |
| d) landfilling, mono                                                                                                                                          |                       |                         |                            |
| e) landscaping/green areas/land reclamation                                                                                                                   |                       |                         |                            |
| f) agriculture/horticulture                                                                                                                                   |                       |                         |                            |
| g) forestry                                                                                                                                                   |                       |                         |                            |
| h) other usages                                                                                                                                               |                       |                         |                            |
| 3. Have actions been taken to reduce the leakage of nutrients from sludge handling?                                                                           | Yes                   | No                      | Unknown/ comments          |
| 4. Describe how the Recommendation concerning sewage sludge handling has been implemented; new legislation, amendment to existing legislation or other means. |                       |                         |                            |
| 5. Does your country technically recover phosphorus from<br>a) waste water,<br>b) sewage sludge or<br>c) sewage sludge ashes?                                 | Yes                   | No                      | Percentage of total amount |

Contracting Parties shall also report:

- Information on concentrations of hazardous substances in sewage sludge and national limit values for hazardous substances, pathogens, and other relevant parameters in sewage sludge and soil;
- Information on the amount of phosphorus recovered from the sewage sludge or products of its treatment.