

HELCOM RECOMMENDATION 17/6

Adopted 12 March 1996
having regard to Article 13, Paragraph b)
of the Helsinki Convention

REDUCTION OF POLLUTION FROM DISCHARGES INTO WATER, EMISSIONS INTO THE ATMOSPHERE AND PHOSPHOGYPSUM OUT OF THE PRODUCTION OF FERTILIZERS

THE COMMISSION,

RECALLING that according to Article 6 of the Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1974 (Helsinki Convention) the Contracting Parties shall take all appropriate measures to control and strictly limit pollution by noxious substances and nutrients,

RECALLING ALSO that Annex II of the Helsinki Convention defines heavy metals as noxious substances for the purposes of Article 6 of the Convention, and that Annex III of the Convention defines nutrients as substances to be controlled to minimize land-based pollution of the marine environment,

RECALLING FURTHER that the Ministerial Declaration of the ninth meeting of the Helsinki Commission calls for a considerable reduction of land-based pollution,

RECOGNIZING that the production of fertilizers is responsible for an important part of the discharges of heavy metals and nutrients into the Baltic Sea,

DESIRING to limit the discharges, emissions and wastes (phosphogypsum) of this industry with Best Available Technology,

RECOMMENDS to the Governments of the Contracting Parties that they apply the following requirements to the product lines of the fertilizer industry listed below:

- A. production of nitrogen-containing multi nutrient fertilizers (NP, NPK)
- B. production of nitrogen fertilizers
- C. production of phosphate fertilizers
- D. production of phosphoric acid.

1. **Waste water discharges**

1.1. **Measures to avoid/minimize waste water discharges**

The amount and harmful effects of waste water resulting from the production of fertilizers should be kept as low as possible by using the following measures, inter alia:

- no discharge of phosphogypsum into the recipient;
- use of low pollutant raw materials (e.g. phosphate rock with low heavy metal content wherever possible);
- avoidance of highly contaminated sulphuric acid (residues from industrial processes) for the digestion of phosphate rock;
- recirculation of waters to the largest extent possible, e.g. of gas scrubbers, application of multistage gas scrubbers;
- recirculation of vapours, condensates and process waters;
- multiple use of process water in other fields;
- use of rain-waters;
- avoidance of direct cooling/quenching;
- use of dry process methods wherever possible and appropriate.

By the application of these or equivalent techniques and, possibly, in conjunction with the evaporation of small residual waste water quantities, a few products as for example nitrolime or superphosphate could be produced without waste water being generated.

1.2 **Treatment technologies**

Waste water which could not be avoided should be treated with the techniques given below, if necessary, in combination or by equally effective measures:

- sedimentation/filtration;
- concentration/evaporation preferably with subsequent recirculation to production;
- concentration by means of ion exchangers;
- precipitation of phosphate/fluoride/heavy metals by lime slurry, including multistage heavy metal precipitation with flocculation/filtration;
- ammonia stripping;
- biological waste water treatment with nitrification/denitrification and phosphoric precipitation.

1.3 Limit values

The following load values should not be exceeded as annual mean values:

	Product line A (NP, NPK) *)	Product Line B (N) *)	Product Line C (P, PK) **)	Product Line D (Phosphorus Acid) **)
Total Nitrogen (kg N/t)	0.6	0.7	-	-
Phosphate-P (kg/t)	0.04	-	0.05	0.02
Fluoride (kg/t)	0.15	-	0.3	0.05
Cadmium (g/t)	0.02	-	0.05	0.1
Mercury (g/t)	0.003	-	0.01	0.01
Zinc (g/t)	0.7	-	1	1

*) load values related to the nitrogen content in the product

***) related to the phosphorpentoxide (P₂O₅) in the product

If a limit value is omitted in the table, then it is of no relevance for the product line.

2. Emissions into the atmosphere

Air emissions resulting from the production of fertilizers should be treated by appropriate techniques (Table 1) and comply with the following limit values:

NO _x (mg/m ³ related to NO ₂)***)	500
dust (mg/m ³)	50 (75mg/m ³ in case of fertilizers containing more than 10% SO ₄ or more than 50% NH ₄ -NO ₃)
Fluorine compounds (mg/m ³)	5
Chlorine compounds (mg/m ³)	30

***) only if emissions into the atmosphere of NO_x are expected

Table 1: Recommended techniques for air pollution abatement and treatment

Operation stage	Emitted substance	Minimization measure
Reloading and transportation of raw phosphates	dust	plant enclosure, waste air treatment by means of filters
Production of NP/NPK fertilizer (product line A) - dissolution with nitric acid - neutralization with ammonia - granulation and drying	fluorides, NO _x NH ₃ , F compounds dust	multi-stage scrubber gas scrubber cyclones
Production of single nutrient nitrogen fertilizer (product line B) Production of single nutrient phosphate fertilizer (product line C)	NH ₃ hydrogen fluoride, phosphate dust	process optimization wet scrubber
Production of PK fertilizer (product line C)	dust, hydrogen fluoride, hydrogen chloride	wet scrubber
Production of phosphoric acid (product line D) - sulphuric acid dissolution - sulphuric acid/nitric acid dissolution - upgrading of acid	fluorides, NO _x fluorides phosphoric acid fog, fluorides	wet scrubber wet scrubber lamellar precipitator or grid packings

3. Waste (phosphogypsum)

Phosphogypsum from the sulphuric acid dissolution should be re-used to the extent possible. If this is not practicable it has to be disposed of in a disposal facility appropriately equipped. A discharge into waters does not comply with BAT,

RECOMMENDS ALSO that these measures should be implemented by 1 January 1998 for new plants and by 1 January 2002 for existing plants,

RECOMMENDS FURTHER that the Contracting Parties report to the Commission every three years starting from 2003,

DECIDES that this Recommendation should be reconsidered in 2004, especially regarding limit values for the different product lines and products.

REPORTING FORMAT FOR HELCOM RECOMMENDATION 17/6 CONCERNING THE REDUCTION OF POLLUTION FROM DISCHARGES INTO WATER, EMISSIONS INTO THE ATMOSPHERE AND PHOSPHOGYPSUM OUT OF THE PRODUCTION OF FERTILIZERS

Country: _____ Year: _____

1. Site specific information (please fill in one sheet for every location)

1.1 Product specification

Fertilizers produced	Product line	Production t/a	Production process used

Other chemical production at the location Yes _____ No: _____
If yes, please describe further

1.2 Description of internal measures and air pollution abatement technologies (see sections 1.1 and 2 of the Recommendation)

1.3 Description of waste water treatment facility (see section 1.2 of the Recommendation)

1.4 Description of the disposal facility for phosphogypsum

1.5 Discharge data

- Compliance with the Recommendation Yes: _____ No: _____
If no, please describe further
- Additional data

Waste water volume m³/a:
Cadmium t/a:
Mercury kg/a:
Zinc t/a:
Total Nitrogen t/a:
Phosphate-P t/a:
Fluoride t/a:

1.6 Emission data into the atmosphere

- Compliance with the Recommendation Yes: _____ No: _____
If no, please describe further
- Additional load data

Dust t/a:
Fluorine compounds t/a:
NO_x t/a:
Chlorine compounds t/a: