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Antalya, Turkey, 7-10 December 2021

Agenda Item 3: Thematic Decisions

Draft Decision IG.25/8: Regional Plans on Urban Wastewater Treatment and Sewage Sludge Management in the Framework of Article 15 of the Land Based Sources Protocol

UNEP/MAP
Athens, 2021

Note by the Secretariat

The 21st Ordinary Meeting of the Contracting Parties (COP-21) to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols (Naples, Italy, 2-5 December 2019) adopted Decision IG.24/10 which mandated UNEP/MAP (MED POL Programme) to (i) upgrade the Regional plan on the reduction of BOD5 from urban wastewater in the framework of the implementation of article 15 of the Land-based Sources Protocol (Decision IG.19/7), namely the Regional Plan on Urban Wastewater Treatment; and to (ii) develop a new Regional Plan on Sewage Sludge Management (hereafter both of which are referred to as the "Regional Plans").

To this aim, COP21 Decision IG.24/10 requested the establishment of a Working Group of Experts designated by the Contracting Parties to review the Regional Plans. Two meetings were held in December 2020 and May 2021, as well as the MED POL FP Meeting held back to back with the 2nd working group meeting. During these meetings, the Contracting Parties discussed the proposed measures of the Regional Plans, building over previous deliberations, and incorporated several modifications and amendments to the scope of these measures and the target dates proposed for adoption and/or implementation.

The updated **Regional Plan on Urban Wastewater Treatment** included in Annex I of this Draft Decision encompasses substantive enhancements over the previous Regional Plan on the Reduction of BOD5. Specifically, Emission Limit Values (ELVs) have been expanded to cover most pollutants discharged by treated effluent wastewater, including also reclaimed wastewater and industrial effluents. Scope of measures include, in addition to previously covered effluent wastewater discharged to the recipient environment, wastewater reclamation and reuse as well as industrial effluents. Specific provisions are included for monitoring wastewater discharges from wastewater treatment plants as well as for reclaimed water and industrial effluents. Legally binding deadlines are proposed for adoption of ELVs and implementation of investment measures to meet these ELVs. The timelines for adoption of the legally binding ELVs, their values, as well as related measures emanating from these commitments constituted the core discussions carried out by the Contracting Parties in all previous meetings. Annex II of this Draft Decision provides an overview of the timetable for implementation of these measures presented as a Gantt chart. Based on the recommendations of the MED POL Focal Points Meeting to undertake an analysis of existing global and regional related commitments, the Secretariat would like to highlight the following points:

- With regard to provision of collecting systems for agglomerations (foreseen to be implemented in this Regional Plan between 2025 to 2035 depending on agglomeration size), the Strategic Action Plan (SAP-MED) specifies that wastewater collecting systems for agglomerations in excess of 100,000 should be completed by 2005, while for all other agglomerations by 2025. For the concerned Contracting Parties, EU Directive 91/271/EEC provides dates extending between 1998 and 2005 depending on the sensitivity of the recipient environment. The 2009 Regional Plan for reduction of discharge of BOD5 provides two deadlines in 2015 and 2019. SDG 6 stipulates the year 2030 for ensuring access to sanitation;
- Concerning the adoption of ELVs as provided for in Appendix I (foreseen to be adopted in this Regional Plan by 2025), SAP-MED foresees the year 2010 to formulate and adopt environmental quality criteria and objectives, and emission limit values for point source discharges. The 2009 Regional Plan for reduction of discharge of BOD5 notes that deadlines for adoption of ELVs should take into account the Contracting Parties' national circumstances and respective capacity to implement the required measures. SDG 6.3 foresees the improvement of water quality by year 2030;

- SAP-MED specifies the year 2025 as a deadline for treatment of urban wastewater from all agglomerations. For the concerned Contracting Parties, EU Directive 91/271/EEC provides dates for treatment of wastewater extending between 1998 and 2005 depending on the sensitivity of the recipient environment. The 2009 Regional Plan for reduction of discharge of BOD5 provides two deadlines for treatment of effluents wastewater in 2015 and 2019. SDG 6 specifies the year 2030 as a deadline for halving the proportion of untreated wastewater;
- And concerning industrial wastewater discharged into collecting systems and urban WWTPs, the present Regional Plan indicates that the emission limit values set in Appendix I shall be met latest by 2035. In that regards, SAP-MED foresees the year 2025 whereby point source discharges into the Protocol Area from industrial installations to be in conformity with the provisions of the Protocol and other agreed international and national provisions. For the concerned Contracting Parties, the EU IPPC (2007) and IED Directives require industry to implement BAT in the treatment of industrial wastewater (further to transposing its provisions into national legislation by 2013.

With regard to the **Regional Plan for Sewage Sludge Management,** presented in Annex III of this Draft Decision, the scope of measures covers the various uses of sewage sludge; limit values for pathogen contents and heavy metals in biosolids for agricultural use, as well as aspects related so sludge use for energy/nutrient recovery; reducing impacts of climate change; and monitoring of quality of sewage sludge from wastewater treatment plants.

The Working Group and the MED POL Focal Points meetings focused in previous meeting on the various aspects related to classes of biosolids and their uses. The Secretariat would like to highlight the following points:

- With regard to adoption of Class A biosolids by 2025, SAP-MED had set the year 2000 to adopt environmental quality criteria and standards for the use of treated wastewater and sewage sludge. For the concerned Contracting Parties, EU Directive 86/278/EEC contains limit values similar to those proposed by the Regional Plan.
- Concerning the establishment, at the latest by 2035, of infrastructure for implementation of the requirements of the applicable measures of this Regional Plan with regards to the use for agricultural land applications and/or for energy/nutrient recovery, SAP-MED promotes by the year 2000 the beneficial reuses of sewage effluents and sludges by the appropriate design of treatment plants and processes and controls of the quality of influent waste waters in accordance with national regulations.

Annex IV of this Draft Decision provides an overview of the timetable for implementation of the above measures presented as a Gantt chart.

Finally, regarding investment, operation and maintenance, as well as administrative costs for implementation of the technical measures included in the Regional Plans (such as wastewater collection and treatment, collection and treatment of sewage sludge, etc.), these vary widely between the different Contracting Parties, and even within the Contracting Party itself depending on the scope of the measure; the way it is administered; technology applied; costs of inputs such land, energy and labour costs; etc. Based on an assessment of costs undertaken by the Secretariat on implementation of the main measures proposed in the Regional Plans and associated socioeconomic benefits, unit investment cost of additional wastewater treatment infrastructure is estimated at 140 USD/p.e. for secondary treatment, and 165 to 275 USD/p.e. for tertiary treatment with phosphorus removal only at the low end, and phosphorus and nitrate removal at the high end. In that respect, the Secretariat has introduced several activities in the Programme of Work for the biennium 2022-2023 to support implementation of the Regional Plans. This includes a state of play report on pre-treatment of industrial effluents standards for industries discharging into urban wastewater collection systems; preparatory studies on investment potential for wastewater treatment/collection network projects addressing NAP hotspots in three countries; capacity building programs for national water and sanitation agencies; and regional standards for urban wastewater treatment and sewage sludge management with an overall budget (MTF and external) in excess of USD 200,000.

The draft decision and its Annexes were submitted to and reviewed by the Meeting of the Mediterranean Action Plan (MAP) Focal Points 2021 (Teleconference, 10-17 September 2021) that decided its transmission to the 22nd Meeting of the Contracting Parties (COP 22) (Antalya, Turkey, 7-10 December 2021).

The Secretariat would like to bring to the attention of the Contracting parties that under Article 5 of the Regional Plan on Wastewater Treatment there are two sections respectively points 6 and 9 in square brackets.

Draft Decision IG.25/8

Regional Plans on Urban Wastewater Treatment and Sewage Sludge Management in the Framework of Article 15 of the Land Based Sources Protocol

The Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) and its Protocols at their 22nd Meeting,

Recalling United Nations General Assembly resolution 70/1 of 25 September 2015, entitled "Transforming our world: the 2030 Agenda for Sustainable Development",

Recalling also the United Nations Environment Assembly resolution of 15 March 2019, UNEP/EA.4/Res. 21, entitled "Towards a pollution-free planet",

Recalling further the United Nations Environment Assembly resolutions of 6 December 2017, UNEP/EA.3/Res.10, entitled "Addressing water pollution to protect and restore water-related ecosystems", and of 15 March 2019, UNEP/EA.4/L.12, entitled "Protection of the marine environment from land-based activities",

Having regard to the Barcelona Convention, in particular Article 8 thereof, whereby Contracting Parties shall take all appropriate measures to prevent, abate, combat and to the fullest possible extent eliminate pollution of the Mediterranean Sea Area and draw up and implement plans for the reduction and phasing out of substances that are toxic, persistent and liable to bioaccumulate arising from land-based sources,

Having also regard to the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources and Activities, hereinafter referred to as "the Land-based Sources Protocol," in particular Article 5 thereof, whereby Contracting Parties undertake to eliminate pollution deriving from land-based sources and activities and to this end shall elaborate and implement national and regional action plans and programmes, containing measures and timetables for their implementation, and Article 15 paragraph 3 thereof, whereby the measures and timetables contained in the regional action plans and programmes adopted under Article 15 are binding,

Recalling Decision IG.24/10 on Main Elements of the Six Regional Plans to Reduce/Prevent Marine Pollution from Land-Based Sources; Updating the Annexes to the LBS and Dumping Protocols of the Barcelona Convention, adopted by the Contracting Parties at their 21st Meeting(COP21) (Naples, Italy, 2-5 December 2019),

Conscious of the urgent need to enhance action in synergy with relevant regional and global initiatives, such as the UNEP Global Wastewater Initiative (GW^2I); the Global Partnership for Nutrient Management (GPNM); the 2030 agenda of the Sustainable Development Goals (SDGs); Water and Environment Support in the ENI Southern Neighborhood Region (WES); UfM Water Agenda: "advancing solutions to water-related challenges," to substantially reduce pollution in the Mediterranean, to prevent and reduce pollution from wastewater and excess nutrients, and the harmful effects thereof and, where appropriate, coordinate such action to achieve that end,

Committed to increased efforts to tackle the regional challenges in dealing with urban wastewater treatment and sewage sludge management in order to protect the coastal and marine environment and human health from adverse effects of wastewater discharges and ensure the effective reuse of beneficial substances and exploitation of energy potential of sewage sludge,

Recalling the mandate of the Mediterranean Pollution Assessment and Control Programme (MEDPOL) to contribute to the prevention and elimination of land-based pollution of the Mediterranean, and to assist the Contracting Parties, through planning and coordination of initiatives and actions, to meet their obligations under the Barcelona Convention and its Protocols,

Having considered the report of the MED POL Focal Points Meeting (Videoconference, 27-28 May 2021),

1. *Adopt* the Regional Plan on Urban Wastewater Treatment in the framework of Article 15 of the Land-based Sources Protocol, set out in Annex I to this decision;

2. *Adopt* the Regional Plan on Sewage Sludge Management in the framework of Article15 of the Land-based Sources Protocol, set out in Annex III to this decision;

3. *Adopt* the work plans with timetables for the implementation of articles of the Regional Plan on Urban Wastewater Treatment and the Regional Plan on Sewage Sludge Management, set out in Annexes II and IV to this decision, respectively;

4. *Call upon* the Contracting Parties to effectively implement the Regional Plans on Urban Wastewater Treatment and Sewage Sludge Management and to report to the Secretariat, accordingly, as provided for in its Article 19;

5. *Request* the Secretariat (MED POL) to provide, upon request and subject to availability of funds, the necessary assistance to the Contracting Parties for the implementation of the measures provided for in the Regional Plans on Urban Wastewater Treatment and on Sewage Sludge Management;

6. *Urge* the Contracting Parties, intergovernmental organizations, donor agencies, industry, non-governmental organizations and academic institutions to support the implementation of the different measures of the Regional Plans on Urban Wastewater Treatment and on Sewage Sludge Management by providing sufficient financial, technical and scientific contribution.

ANNEX I

Regional Plan on Urban Wastewater Treatment

Regional Plan on Urban Wastewater Treatment

ARTICLE I
Definition of Terms

For the purpose of this Regional Plan for Urban Wastewater Treatment; hereinafter referred to as the "Regional Plan":

a) "Agglomeration" means an area where the population and/or economic activities are sufficiently concentrated for urban wastewater to be collected and conducted to an urban wastewater treatment plant or to a final discharge point;
b) "Appropriate treatment" means treatment of urban wastewater by any process and/or disposal system which after discharge allows the receiving waters to meet the relevant quality objectives;
c) "Aquifer" is an underground rock formation or sedimentary deposit porous enough to hold water that can be used to supply wells;
d) "Aquifer recharge" is the process of water infiltration by rainfall or other surface water into the ground. Groundwater recharge or deep percolation is a hydrologic process, whereby water moves downward from surface water to groundwater;
e) "Best Available Techniques (BAT)" as defined in Annex IV for the Land-Based Source and Activities (LBS) Protocol;
f) "Best Environmental Practice (BEP)" as defined in Annex IV for the Land-Based Source and Activities (LBS) Protocol;
g) "Biochemical Oxygen Demand (BOD5)" Amount of oxygen needed for the biochemical oxidation of the organic matter to carbon dioxide in 5 days;
h) "Collecting system" means a system of conduits which collects and conducts urban wastewater;
i) "Contaminants of Emerging Concern (CEC)" include several types of chemicals: persistent organic pollutants (POPs), pharmaceuticals and personal care products (PPCPs), including a wide suite of human prescribed drugs, veterinary medicines such as antimicrobials, antibiotics, anti-fungal, growth promoters and hormones; endocrine-disrupting chemicals (EDCs), including synthetic estrogens and androgens, nanomaterials such as carbon nanotubes or nano-scale particulate titanium dioxide, of which little is known about either their environmental fate or effects;
j) "Domestic wastewater" means wastewater from residential settlements and services which originates predominantly from the human metabolism and from household activities;
k) "Emission Limit Value (ELV)" means the maximum allowable concentration of a pollutant in an effluent discharged to the environment;
l) "Good Environmental Status": Concentrations of nutrients in the euphotic layer are in line with prevailing physiographic, geographic and climate conditions;
m) "Industrial wastewater" means any wastewater which is discharged from premises used for carrying on any trade or industry, other than domestic wastewater and run-off rainwater;
n) "Managed aquifer recharge (MAR)" is defined as the intentional recharge of water to aquifers for subsequent recovery or environmental benefit;
o) "One (1) population equivalent (p.e.)" means the organic biodegradable load having a five-day biochemical oxygen demand (BOD5) of 60 grams of oxygen per day. For the purpose of this regional plan, the load expressed in p.e. shall be calculated on the basis of the maximum

average weekly load entering the treatment plant during the year, excluding unusual situations such as those due to heavy rain;

p) "Primary treatment" means treatment of urban wastewater by a physical and/or chemical process involving settlement of suspended solids, or other processes in which the BOD5 of the incoming wastewater is reduced by at least 20 percent before discharge and the total suspended solids of the incoming wastewater are reduced by at least 50 percent;

q) "Reclaimed water" urban wastewater that has been treated to meet specific water quality criteria with the intent of being used for a range of beneficial purposes;

r) "Secondary treatment" means treatment of urban wastewater by a process generally involving biological treatment with a secondary settlement or other process so that the treatment results in a minimum reduction of the initial load of 70 to 90 percent of BOD5;

s) "Tertiary treatment" means treatment of urban wastewater by processes generally involving physical, chemical, biological and other procedures including disinfection when required depending on downstream uses, so that the treatment results in reduction of phosphorus and nitrogen;

t) "Urban wastewater" means the domestic wastewater or the mixture of domestic wastewater with industrial wastewater and/or run-off rainwater;

u) "WEFE" means Water – Energy – Food – Ecosystem Nexus;

v) "Wastewater Treatment Plant (WWTP)" means systems used to treat urban wastewater using physical, chemical and/or biological techniques.

ARTICLE II
Scope and Objective

1. The area to which the Regional Plan applies is the area defined in accordance with Article 3 and Article 4 of the LBS Protocol, consisting of the Mediterranean Sea Area as defined in Article 1 of the Convention; the hydrologic basin of the Mediterranean Sea Area; waters on the landward side of the baselines from which the breadth of the territorial sea is measured and extending, in the case of watercourses, up to the freshwater limit; brackish waters, coastal salt waters including marshes and coastal lagoons; and ground waters communicating with the Mediterranean Sea.

2. The Regional Plan shall apply to the collection, treatment, reuse and discharge of urban wastewaters and the pre-treatment and discharge of industrial wastewater entering collecting systems from certain industrial sectors.

3. The objective of the Regional Plan on Urban Wastewater Treatment is to protect the coastal and marine environment and human health from the adverse effects of the above-mentioned wastewater direct and or indirect discharges, in particular regarding adverse effects on the oxygen content of the coastal and marine environment and eutrophication phenomena as well as promote resource water and energy efficiency.

ARTICLE III
Preservation of Rights

4. The provisions of this Regional Plan shall be without prejudice to stricter provisions respecting the management of urban wastewater treatment plants contained in other existing or future national, regional or international instruments or programs.

ARTICLE IV
Guiding Principles

5. The Regional Plan measures are formulated to ensure the application of the following principles:
   i. Effective reclamation and reuse of treated wastewater is promoted as a means for water resource conservation and efficiency to effectively address regional water scarcity;
   ii. Wastewater collection and treatment systems incorporate aspects related to climate change impacts in the design and operation phases, including extreme hydrological patterns and their impact on influent wastewater;
   iii. Wastewater treatment processes promote energy efficiency and water savings, and integrate renewable energy alternatives to the extent possible in accordance with BAT and BEP;
   iv. Industrial wastewater is treated to the extent possible on site. Industrial wastewater entering collecting systems and WWTPs are subject to pre-treatment, if necessary, in order to (a) protect the collecting systems and the treatment plant; (b) ensure that the operation of the WWTP and the treatment of the sludge are not impeded; and (c) ensure that discharge effluents do not adversely affect the Mediterranean marine environment, particularly for priority substances, contaminants of emerging concern which are harmful to the receiving waters and cannot be treated in urban WWTPs;
   v. For the purpose of this Regional Plan, WEFE nexus is incorporated into the design phase of WWTPs with the aim to promote energy efficiency and reuse of reclaimed wastewater;
   vi. Selection of treatment technologies takes into consideration investment and operational costs of the treatment technology and the ability to pay by beneficiaries in order to ensure sustainable and reliable quality-treated wastewater.

ARTICLE V
Measures

I. Collection and treatment of urban wastewater

6. The Contracting Parties shall ensure that all agglomerations are provided with collecting systems for urban wastewater as follows:
   i. At the latest by 2025, [to the extent possible,] for those with a population equivalent (p.e.) of more than 15,000;
   ii. At the latest by 2030, [to the extent possible,] for those with a population equivalent (p.e.) between 2000 and 15,000.

7. The Contracting Parties shall set emission limit values for discharge of treated effluents from WWTPs upon implementation of necessary measures. To this aim, the Contracting Parties shall

adopt at the latest by 2025 the emission limit values as provided for in Appendix I for the following categories:

i. Discharge of effluents from urban wastewater treatment plants to the environment (Appendix I.A).
ii. Reuse of reclaimed wastewater for agriculture irrigation Appendix I.B).
iii. Discharge of industrial wastewater into collecting systems and urban wastewater treatment plants (Appendix I.C).

8. The Contracting Parties may approve stricter emission limit values than those provided in Appendix I considering the characteristics of receiving/recipient environment.

9. The Contracting Parties shall ensure that prior to discharge, treated wastewater from urban WWTPs meets the following requirements by 2030 at the latest, [to the extent possible]:
   i. All discharges from agglomerations of more than 15,000 p.e. are subject to the extent possible to tertiary treatment provided that the Good Environmental Status (GES) of the recipient environment is maintained.
   ii All discharges from agglomerations between 2000 and 15,000 p.e. are subject to the extent possible to secondary treatment provided that the Good Environmental Status (GES) of the recipient environment is maintained.

10. The Contracting Parties shall promote to the extent possible nature-based solutions for small agglomerations of less than 2000 p.e. with a focus on constructed wetlands where applicable and individual or other appropriate system in accordance with best available technology.

11. The Contracting Parties shall ensure that urban wastewater treatment plants, built to comply with the requirements of Articles 7 and 8, are designed, constructed, operated and maintained to ensure sufficient performance under normal local climatic conditions.

12. The Contracting Parties shall ensure that WWTPs are designed to account for:
   i. Seasonal variations of loads including from touristic activities;
   ii. Volume and characteristics of the local municipal wastewater; and
   iii. Limitation of pollution of receiving water (taking into consideration, inter alia, Contaminants of Emerging Concern).

13. The Contracting Parties shall implement measures for:
   i. Segregating collecting systems for storm water and municipal wastewater, if technically and economically feasible;
   ii. Preventing or if not possible minimizing sewage and wastewater treatment plants' overflow due to rainwater penetration and flooding;
   iii. Addressing impacts of points of discharge of treated wastewater so as to minimize effects on receiving waters;
   iv. Adopting tools for conservation of surface water runoff in built environment; and
   v. Reducing pollutant loads and litter in storm water runoff from municipal and industrial sources.

II. <u>Reclamation and reuse of wastewater</u>

14. The Contracting Parties shall promote the reuse of reclaimed wastewater. To this aim, the Contracting Parties shall:

i. Ensure that treatment technologies and additional treatments for reclaimed wastewater meet the emission limit values for reuse of reclaimed wastewater as provided for in Appendix I.B.

ii. Implement wastewater reuse systems that include, inter alia:

a) Storage and distribution systems for reuse of reclaimed wastewater effluents in agriculture;

b) Recharge methods in case of managed aquifer recharge strictly complying with Appendix II Guiding Principles.

III. Industrial wastewater discharge

15. By 2025 at the latest, the Contracting Parties shall ensure that the competent authority or appropriate body adopt emission limit values appropriate to the nature of industry discharging industrial effluents to collecting systems connected to urban WWTPs.

16. By 2035 at the latest, the Contracting Parties shall ensure that industrial wastewater discharged into collecting systems and urban WWTPs shall meet, as a minimum, the emission limit values set in Appendix I.C.

IV. Monitoring

17. The Contracting Parties shall take measures to ensure regular monitoring in accordance with general elements, monitoring frequencies and compliance criteria requirements as provided in Appendix III of the Regional Plan:

i. Discharges from urban wastewater treatment plants to verify compliance with the requirements.

ii. Receiving waters subject to discharges from urban wastewater treatment plants.

iii. Quality of reclaimed wastewater discharged from treatment plants for beneficial use.

iv. Discharged industrial effluents to collecting systems including substances harmful to receiving waters, sewerage networks and urban wastewater treatment plants.

ARTICLE VI
Technical Assistance, Transfer of Technology and Capacity Building

18. For the purpose of facilitating the effective implementation of Article V of this Regional Plan, the Contracting Parties collaborate to implement, exchange and share best practices directly or with the support of the Secretariat including BAT, BEP, sustainable consumption and production, circular economy, resource efficiency, WEFE Nexus in the design, construction, operation and maintenance of the urban wastewater treatment plants in the context of Integrated Water Resources Management. To this aim, the Contracting Parties also collaborate in preparing and implementing common technical guidelines.

ARTICLE VII
Timetable for Implementation

19. The Contracting Parties shall implement the measures included in this Regional Plan as per the timelines associated with these measures.

ARTICLE VIII
Reporting

20. The Contracting Parties shall report on implementation of measures stipulated in this Regional Plan in line with the reporting requirement and timelines provided in Article 26 of the Convention and Article 13, paragraph 2(d) of the LBS Protocol.

ARTICLE IX
Entry into Force

21. The present Regional Plan shall enter into force and become binding on the 180th day following the day of notification by the Secretariat in accordance with Article 15, paragraphs 3 and 4, of the LBS Protocol.

APPENDIX I.A

Emission Limit Values for discharge of effluents from urban wastewater treatment plants to the environment

The competent authority shall set emission limit values for wastewater treatment in accordance with a combined approach taking into account best available techniques and compliance with quality standards enabling the good environmental status of the receiving environment to be achieved.

*Table 1: Emission limit values for discharge of urban wastewater effluents to the environment **

Parameter	Unit	Emission limit values
BOD_5	mg/L	25
Total phosphorous	mg/L	2
Total Nitrogen	mg/L	40
Total phosphorus	%	Minimum percentage of reduction of overall load entering WWTP is at least 75%
Total nitrogen	%	
Arsenic (As)	mg/L	0.5
Cadmium (Cd)	mg/L	0.025
Chlorine residual	mg/L	0.3
Chromium (Cr)	mg/L	0.25
COD	mg/L	125
Copper (Cu)	mg/L	0.5
Cyanide	mg/L	0.01
Lead (Pb)	mg/L	0.04
Mercury (Hg)	mg/L	0.0025
Mineral Oil	mg/L	1.5
Nickel	mg/L	0.25
pH	pH unit	6 to 9
Phenol	mg/L	0.15
Total Suspended Solids (TSS)	mg/L	30
Zinc	mg/L	1
Total Hydrocarbons	mg/L	10

** Different emission limit values, including for other parameters, may be adopted further to a risk-based assessment provided that there is no negative impact on the recipient environment*

Emission limit values (ELVs) for other emerging pollutants may be set considering the following factors:

- Setting thresholds for toxicity of effluent streams discharged to the environment to prevent toxicity to aquatic organisms;
- Determination of the minimum percentage of biodegradability of the effluent streams (at least 80%) to achieve minimum accumulation in the ecosystem and losses of habitats and biodiversity; and
- Identification of potential microplastic sources and adoption of related policy and methodology further to state of the art on related research on this topic.
- Emission limit values for microbiological parameters shall be established through a risk assessment to ensure that post-discharge uses, such as bathing, supply or irrigation, where appropriate, and in accordance with WHO guidelines for bathing areas, are not compromised by the effect of discharge.

APPENDIX I.B

Emission limit values for reuse of reclaimed wastewater for agriculture irrigation

Classes definitions for reclaimed wastewater for reuse in agriculture irrigation:

Class A – **All food crops**, including crops eaten raw when reclaimed wastewater comes into direct contact with edible parts of the crop, and irrigation of root crops.

Class B - **Processed food crops**: crops which are intended for human consumption not to be eaten raw but after a treatment process; food crops consumed raw where the edible part is produced above ground and is not in direct contact with reclaimed water or food, which are not irrigated with drip irrigation or other irrigation method that avoids direct contact with the edible part of the crop. **Non-food crops**: crops which are not intended for human consumption.

Table 2: Emission limit values for reclaimed wastewater use in agricultural irrigation according to Class definition

Parameter	Limit values for reclaimed water quality class for effluent reuse in agricultural irrigation *	
	Class A	Class B
BOD5	≤10 mg/L	25 mg/L or reduction of the influent load of 70% to 90%.
COD**	100 mg/L	125 mg/L
Escherichia coli	≤10 cfu/100 ml	≤100 cfu/100 ml
Fecal Coli	≤10 cfu/100ml or below detection limit	≤100 cfu/100ml
Intestinal nematodes (helminth eggs)	≤1 egg/l	≤1 egg/l
Legionella spp	≤1,000 cfu/l	≤1,000 cfu/l
Total Suspended Solids (TSS)	≤10 mg/L	35 mg/L or reduction of influent load of 90%.
Turbidity	≤5 NTU	None
Parameters applicable to both Classes (A and B)		
Total Nitrogen	25	
Total phosphorous	5	
Sodium - Na	150	
Chlorides - Cl	250	
Boron - B	0.5	
Heavy metals		
Cadmium - Cd	0.01	
Chromium - Cr	0.1	
Copper - Cu	0.2	
Mercury - Hg	0.002	
Nickel - Ni	0.2	
Lead - Pb	0.1	

Parameter	Limit values for reclaimed water quality class for effluent reuse in agricultural irrigation *	
	Class A	Class B
Zinc - Zn	0.5	
pH	6.5-8.5	
Additional heavy metals		
Aluminium - Al	1 to 5	
Arsenic - As	0.1	
Beryllium - Be	0.1	
Cobalt - Co	0.05	
Iron - Fe	2	
Lithium - Li	2.5	
Manganese - Mn	0.2	
Molibdenum - Mo	0.01	
Selenium - Se	0.02	
Vanadium - V	0.1	

* *Different emission limit values, including for different parameters, may be adopted further to a risk-based assessment provided that the total loads do not affect the recipient environment and human health*

APPENDIX I.C

Emission limit values for discharge of industrial wastewater into collecting systems and urban wastewater treatment plants

Industrial wastewater entering collecting systems and urban wastewater treatment plants shall be subject to pre-treatment as required in order to:

- Protect the health of staff working in collecting systems and treatment plants.
- Ensure that collecting systems, WWTP and associated equipment are not damaged.
- Ensure that the operation of the WWTP and the treatment of sludge are not impeded.
- Ensure that discharges from the treatment plants do not adversely affect the environment or prevent receiving water from complying with other regulatory requirements.
- Ensure that sludge can be treated and disposed of safely in an environmentally acceptable manner.

Table 3: Emission limit values (ELV) for industries to discharge their effluents to collecting systems and Urban WWTPs which will not damage wastewater treatment processes and does not affect the recipient environment

Parameter	Unit	Limit values for effluent discharge *
Aluminium - Al	mg/L	25
BOD5	mg/L	COD concentration not to exceed four times BOD concentration
Fluoride – F	mg/L	6
Sodium - Na	mg/L	230
Phenols	mg/L	3
Total O&G	mg/L	250
Arsenic - As	mg/L	0.1
Benzene	mg/L	0.05
Beryllium - Be	mg/L	0.5
Cadmium - Cd	mg/L	0.1
Chloride - Cl	mg/L	430
Chlorine	mg/L	0.5
Chromium - Cr	mg/L	0.5
Cobalt - Co	mg/L	1
COD	mg/L	2000
Copper - Cu	mg/L	0.5 to 1
Cyanide	mg/L	0.2 to 0.5
AOX	mg/L	1
Lead - Pb	mg/L	0.5
Lithium - Li	mg/L	0.3
Manganese - Mn	mg/L	1
Mercury - Hg	mg/L	0.05
Mineral Oil	mg/L	20
Molybdenum - Mo	mg/L	0.15
Nickel - Ni	mg/L	0.5
Total phosphorous - (TP)	mg/L	30
pH	units	6.0-10.0
Polyphenols	mg/L	100
Selenium - Se	mg/L	0.05
Total Dissolved Solids (TDS)	mg/L	3,500
Temp	C°	40° Celsius
Tin - Sn	mg/L	2

Parameter	Unit	Limit values for effluent discharge *
Total Nitrogen - (TN)**	mg/L	15-30
Total Hydrocarbons	mg/L	20
Toxicity to fish eggs (Tegg)		2
Total Suspended Solids (TSS)	mg/L	1000
Vanadium - V	mg/L	0.5
Volatile halogenated hydrocarbons (VHHC)	mg/L	0.1***
Zinc - Zn	mg/L	3

** The adoption and implementation of the ELVs shall respond to the respective industries. Different emission limit values, including for different parameters, may be adopted further to a risk-based assessment also in line with national regulations and procedures in collaboration with the operators of treatment plants. ELVs may be increased for small industries discharging to the collecting system when (i) the plant uses BAT and (ii) the effects of the discharged effluent on the collecting system and the WWTP are negligible.*

*** Total nitrogen as the sum of ammonia nitrogen, nitrite nitrogen and nitrate nitrogen*

**** Volatile halogenated hydrocarbons - sum of trichloroethene, tetrachloroethene, 1,1,1-trichloroethane, dichloromethane - calculated as chlorine*

APPENDIX II

Guiding principles on reuse of reclaimed wastewater for aquifer recharge

Managed aquifer recharge (MAR) is defined as the intentional recharge of water to aquifers for subsequent recovery or environmental benefit. The purposes for undertaking managed aquifer recharge are as follows:

- Establish saltwater intrusion barriers in coastal aquifers.
- Provide storage for the recharged water for subsequent retrieval and reuse.
- Maintain groundwater dependent terrestrial and aquatic ecosystems.
- Dilute saline or polluted aquifers.
- Control or prevent ground subsidence.

Recharge methods:

1. **Surface spreading** – a method of recharge whereby the water moves from the land surface to the aquifer by infiltration and percolation through the vadose zone. When used as a recharge method, adverse effects to the soil and related dependent ecosystems should be avoided.
2. **Direct injection** – a method of directly pumping/ injecting water into the groundwater zone. Direct discharges of pollutants into groundwater is not allowed.

Risk assessment:

Health and environmental risk assessment is needed to define minimum quality requirements. The assessment will address appropriate health protection; provision of public confidence in reuse practices; avoiding adverse effects on groundwater, soils and related dependent ecosystems. The overall levels of health protection should be comparable for different water-related exposures (i.e. drinking water, and reclaimed water for irrigation of food crops).

APPENDIX III

Monitoring frequencies of pollutants discharged directly to the environment; or destined for reuse in agriculture; or discharged from industrial facilities to collecting systems

Monitoring the treated effluents discharge from urban WWTPs is used to determine compliance with emission limit values for discharge to the environment; to reuse in agriculture irrigation; or for aquifer recharge (Appendix I.A, Appendix I.B, Appendix I.C).

Monitoring frequencies need to be sufficient to characterize the effluent quality and to detect events of noncompliance, considering the need for data and, as appropriate, the potential cost. Monitoring frequency should be determined on a case-by-case basis, consider the variability of the concentration of various parameters. A highly variable discharge should require more frequent monitoring than a discharge that is relatively consistent over time (particularly in terms of flow and pollutant concentration).

Frequency requirements may be reduced based on a demonstration of excellent performance. Facilities can demonstrate good performance by meeting a set of compliance and enforcement criteria and demonstrating their ability to discharge pollutants below the necessary levels consistently.

The sampling frequency for monitoring of the discharge effluents may be defined to the extent possible as per the tables below:

Table 4: Recommended sampling frequency for treated effluents at the point of discharge

Parameter	Monitoring Frequency		Grab / Composite sample
	Large UWWTP (more than 5,000 p.e.)	Small UWWTP (less than 5,000 p.e.)	
Heavy metals	Once a quarter	Once a year	Composite sample
EC + pH	Continuous monitoring	Once a month	Grab samples
BOD, COD	Once a week	Once a month	Composite sample
Turbidity	Once a week	Once a month	Grab samples
TSS	Every two weeks	Once a month	Composite sample
Nutrients (N, P, K)	Once a week	Once a month	Composite sample
Pathogens	Every two weeks	Once a month	Grab samples
Mineral Oil, Phenol, Total Hydrocarbons	Once a month	Once a month	Grab samples

Table 5: Recommended Minimum frequency for reclaimed wastewater monitoring for agricultural irrigation

Parameter	Monitoring Frequency for reclaimed wastewater quality classes	
	Class A	Class B
BOD	Once a week	Once a month
TSS	Once a week	Once a month
Turbidity	Continuous	Once a month
Escherichia coli	Once a week	Twice a month
Legionella spp *(when applicable)*	Once a week	Once a week
Intestinal nematodes *(when applicable)*	Twice a month or frequency determined according to the number of eggs in wastewater	
Heavy metals	Once a quarter	Once a year
EC and pH	Continuous monitoring	Once a month
Nutrients (N, P, K)	Once a week	Once a month

Table 6: Recommended sampling frequency per year for industrial wastewater at the point of discharge to the collecting systems and urban WWTP

No.	Industrial Activities	Sampling frequency (*)
1	Wastewater containing mineral oil	4 Once every three months
2	Domestic and communal wastewater (function halls, restaurants, shopping malls, hotels etc.)	4 Once every three months
3	Food Sector - Animal and vegetable products	4 Once every three months
4	Food Sector - Meat industry & Fish processing	4 Once every three months
5	Textile sector - manufacturing and finishing	4 Once every three months
6	Metals production and processing	6 Once every two months
7	Laundry Facilities	4 Once every three months
8	Gas stations	4 Once every three months
9	Agriculture: chicken farms, pig farms, fish farms, etc.	4 Once every three months
10	Leather production, fur processing, leather fiber board manufacturing	4 Once every three months
11	Waste and wastewater management	Waste – 4 Once every three months Hazardous waste – 6 Once every two months
12	Production of printing blocks, publications and graphic-arts products	4 Once every three months
13	Chemical industry including chemicals, pharmaceuticals, fertilizers, pesticides, detergents, solvents, petrochemicals, Cosmetic, plastic etc.	Water consumption: - less than 5,000 m^3/year – 6 once every two months - higher than 5,000 m^3/year – 12; once per a year
14	Hospitals	4 Once every three months

* *The sampling rate should reflect the fluctuation of the effluent*

Annex II

Work plan with timetable for the implementation of Articles of the Regional Plan on Urban Wastewater Treatment

Related Article (Paragraph)	Key pollution prevention measures for implementation in the Regional Plan for Urban Wastewater Treatment	Proposed target year for implementation of measures *(* Alternative deadline under consideration)*														
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Art. V (6)	All agglomerations are provided with collecting systems for urban wastewater for those with a population equivalent (p.e.) of more than 15,000															
Art. V (6)	All agglomerations are provided with collecting systems for urban wastewater for those with a population equivalent (p.e.) between 2000 and 15,000											*	*	*	*	*
Art. V (7)	Adopt emission limit values as provided for in Appendix I of the Regional Plan for: (i) discharge of effluents from urban wastewater treatment plants to the environment; (ii) reuse of reclaimed wastewater for agriculture irrigation; and (iii) discharge of industrial wastewater into collecting systems and urban wastewater treatment plants															
Art. V (9)	All discharges from agglomerations over than 15,000 p.e. are subject to the extent possible to tertiary treatment provided that the Good Environmental Status (GES) of the recipient environment is maintained											*	*	*	*	*
Art. V (9)	All discharges from agglomerations of size of between 2000 and 15,000 p.e. are subject to the extent possible to secondary treatment provided that the Good Environmental Status (GES) of the recipient environment is maintained											*	*	*	*	*
Art. V (15)	Competent authority or appropriate body adopt emission limit values appropriate to the nature of industry discharging industrial effluents to collecting systems connected to urban WWTPs															
Art. V (16)	Industrial wastewater discharged into collecting systems and urban WWTPs shall meet, as a minimum, the emission limit values set in Appendix I.C															

Related Article (Paragraph)	Other measures that the Contracting Parties legally commit to undertake as per the Regional Plan with no specific deadlines
Art. V (10)	Promote nature-based solutions to the extent possible for small agglomerations of less than 2000 p.e.
Art. V (11)	Ensure that urban wastewater treatment plants, built to comply with the requirements of Articles 7 and 8, are designed, constructed, operated and maintained to ensure sufficient performance under normal local climatic conditions
Art. V (12)	Ensure that WWTPs are designed to account for seasonal variations of loads; volume and characteristics of the local municipal wastewater; and limitation of pollution of receiving water.
Art. V (13.i)	Implement measures for segregating collecting systems for storm water and municipal wastewater, if technically and economically feasible;
Art. V (13.ii)	Prevent or if not possible minimize sewage and wastewater treatment plants' overflow due to rainwater penetration and flooding;
Art. V (13.iii)	Address impacts of points of discharge of treated wastewater;
Art. V (13.iv)	Adopt tools for conservation of surface water runoff in built environment;
Art. V (13.v)	Reduce pollutant loads and litter in storm water runoff from municipal and industrial sources.
Art. V (14.i)	Promote the reuse of reclaimed wastewater.
Art. V (14.ii)	Implement wastewater reuse systems
Art. V (17)	Take measures to ensure regular monitoring of discharged effluent wastewater, receiving water, reclaimed wastewater and industrial effluents
Art. VI (18)	Collaborate to implement, exchange and share best practices directly or with the support of the Secretariat
Art. VIII (18)	Report on implementation of measures stipulated in this Regional Plan in line with the reporting requirement and timelines provided in Article 26 of the Convention and Article 13, paragraph 2(d) of the LBS Protocol

Annex III

Regional Plan on Sewage Sludge Management

Regional Plan on Sewage Sludge Management

ARTICLE I
Definition of Terms

For the purpose of this Regional Plan for the Sewage Sludge Management; hereinafter referred to as the "Regional Plan":

(a) "Anaerobic digestion" is the biological conversion of organic matter to biogas and residual solids at temperatures between 20°C and about 40°C, typically 37°C with a mean residence time of 15 to 30 days (Mesophilic) or that takes place between 49°C and 57°C (thermophilic);
(b) "Best Available Techniques (BAT)" as defined in Annex IV for the Land-Based Source and Activities (LBS) Protocol;
(c) "Best Environmental Practice (BEP)" as defined in Annex IV for the Land-Based Source and Activities (LBS) Protocol;
(d) "Biosolids" are organic-based materials from industrial or municipal wastewater sludge and their derived products, in the form of solids, semisolids, semi–liquids (pasty), and liquids which have been treated to meet specific standards, guidelines or requirements;
(e) "Collecting system" means a system of conduits which collects and conducts urban wastewater;
(f) "Composting" is the natural aerobic biological process, carried out under controlled conditions, which converts organic material into a stable humus-like product;
(g) "Domestic wastewater" means wastewater from residential settlements and services which originates predominantly from the human metabolism and from household activities;
(h) "Industrial wastewater" means any wastewater which is discharged from premises used for carrying on any trade or industry, other than domestic wastewater and run-off rainwater;
(i) "Primary sludge" is sludge from primary settling tanks, typically grayish and slimy in nature, and, in most of the cases, has an extremely offensive odor. Primary sludge can be readily digested under suitable conditions of operation;
(j) "Primary treatment" means treatment of urban wastewater by a physical and/or chemical process involving settlement of suspended solids, or other processes in which the BOD5 of the incoming wastewater is reduced by at least 20 percent before discharge and the total suspended solids of the incoming wastewater are reduced by at least 50 percent;
(k) "Secondary sludge (activated sludge)" is the sludge particles produced in raw or settled wastewater by the growth of organisms in aeration tanks in the presence of dissolved oxygen. The term activated comes from the fact that the particles are teeming with bacteria, fungi, and protozoa. Activated sludge is different from primary sludge in that the sludge particles contain many living organisms which can feed on the incoming wastewater;
(l) "Secondary treatment" means treatment of urban wastewater by a process generally involving biological treatment with a secondary settlement or other process so that the treatment results in a minimum reduction of the initial load of 70 to 90 percent of BOD5;
(m) "Sludge incineration (waste to energy)" is a two-step process involving drying and combustion after a preceding dewatering process, such as filters, drying beds, or centrifuges;
(n) "Tertiary treatment" means treatment of urban wastewater by processes generally involving physical, chemical, biological and other procedures including disinfection when required depending on downstream uses, so that the treatment results in reduction of phosphorus and nitrogen;
(o) "Urban wastewater" means the domestic wastewater or the mixture of domestic wastewater with industrial wastewater and/or run-off rainwater;
(p) "Wastewater Treatment Plant (WWTP)" means systems used to treat urban wastewater using physical, chemical and/or biological techniques.

ARTICLE II
Scope and Objective

1. The area to which the Regional Plan applies is the area defined in accordance with Article 3 and Article 4 of the LBS Protocol, consisting of the Mediterranean Sea Area as defined in Article 1 of the Convention; the hydrologic basin of the Mediterranean Sea Area; waters on the landward side of the baselines from which the breadth of the territorial sea is measured and extending, in the case of watercourses, up to the freshwater limit; brackish waters, coastal salt waters including marshes and coastal lagoons; and ground waters communicating with the Mediterranean Sea.
2. The Regional Plan shall apply to the treatment, disposal and use of sewage sludge from Urban Wastewater Treatment Plants.
3. The objective of the Regional Plan is to ensure effective reuse of beneficial substances and exploitation of energy potential of sewage sludge, while preventing harmful effects on human health and the environment.

ARTICLE III
Preservation of Rights

4. The provisions of this Regional Plan shall be without prejudice to stricter provisions respecting the management of sewage sludge from urban wastewater treatment plants contained in other existing or future national, regional or international instruments or programs.

ARTICLE IV
Guiding Principles

5. The Regional Plan measures are formulated to ensure the application of the following principles:
   i. Sewage sludge shall meet the required quality criteria suitable for its intended use or disposal;
   ii. Management alternatives are prioritized for beneficial use of sewage sludge in agricultural land applications in order to minimize landfilling and adverse environmental effects;
   iii. Since sewage sludge can have valuable agronomic properties reducing dependence on fertilizers, its application is encouraged in agriculture subject to adequate treatment and quality standards for human health and environment protection.
   iv. Sewage sludge can be used in other applications such as forests, mine reclamation sites, and other disturbed lands, parks, and golf courses, subject to adequate treatment and quality standards for human health and environment protection;
   v. Use of sewage sludge does not impair the quality of the soil and of agricultural products;
   vi. Use of sewage sludge in agriculture is regulated in such a way as to prevent harmful effects on soil, water bodies, vegetation, animals and humans;
   vii. Sewage sludge may be used as an alternative fuel; energy production; and for incineration and co-incineration and other proven applications.

ARTICLE V
Measures

I. Treatment of sewage sludge

6. The Contracting Parties shall ensure that all required sludge treatment processes are carried out in line with common agreed guidelines, in order to obtain treated sludge of quality suitable for their specific use in, inter alia:
   i. Agricultural land application as a fertilizer or for land reclamation;
   ii. Energy recovery; and
   iii. Cement industry.

II. Agricultural use

7. Where specific conditions as provided for in point 9 are used for the spreading of sludge, the Contracting Parties shall apply appropriate treatment to limit the pathogen content in the sludge in order to obtain biosolids for agricultural applications. To this aim, the Contacting Parties shall set classes for sludge with limit values for pathogen contents for biosolids to ensure that use would not affect human health and the environment. The following two "biosolids classes" and corresponding limit values for pathogen content for biosolids are considered. By 2025 at the latest, the Contracting Parties shall adopt Class A. Class B may be adopted where appropriate:
   i. Class 'A' biosolids suitable for use as fertilizer for agricultural crops having met the pathogen reduction requirements set in Table 1 by treatment processes that include a suitable combination of composting, heat drying, heat treatment, thermophilic anaerobic digestion, beta or gamma ray irradiation and pasteurization, or any other equivalent treatment technologies.
   ii. Class 'B' biosolids suitable for use as fertilizer for non-food crops having met the pathogen reduction requirements set in Table 1 by treatment processes that include a suitable combination of aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying, or any other equivalent treatment technologies.

Table 1: Limit values for pathogen content for biosolids classes

Class	Faecal Coliforms *(Escherichia coli)*	Salmonella sp.	Enterovirus*	Helminths ova*
Class A	< 1000 MPN/g DM *(< 1000 MPN/g DM)*	< 3 MPN/4 g DM	1 PFU/4 g DM**	1 viable/4 g DM
Class B	< 2,000,000 MPN/g DM*** *(< 200,000 MPN/g DM)*			

** These parameters may be included based on specific local conditions, and if monitored, lower frequencies may apply.*
*** PFU: Plaque Forming Unit*
*** MPN: Most Probable Number; DM: Dry Matter*
**** Geometric mean of seven samples*

8. The Contracting Parties shall apply adequate treatment to limit concentrations of heavy metals in biosolids destined for agricultural applications. To this aim, the Contacting Parties shall adopt limit values for heavy metals to ensure that use would not affect human health and the environment. The following limit values for heavy metals in biosolids (Table 2) and heavy metals in soil (Table 3) shall be adopted at the latest by 2025.

Table 2: Limit values for concentration of heavy metals in biosolids (mg.kg^{-1} DS) *							
Range**	Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Zinc
Lower	20	1000	1000	16	300	750	2500
Upper	40	1500	1750	25	400	1200	4000

** Different emission limit values, including for other parameters, may be adopted further to a risk-based assessment if there is no negative impact on the recipient environment.*

*** To be defined based on local conditions including soil pH.*

Table 3: Limit values for concentrations of heavy metals in soil to which biosolids is applied (mg.kg^{-1} DS) *							
Range**	Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Zinc
Lower	1	100	50	1	30	50	150
Upper	3	150	140	1.5	75	300	300

** Different emission limit values, including for other parameters, may be adopted further to a risk-based assessment if there is no negative impact on the recipient environment*

*** To be defined based on local conditions including soil pH*

9. The Contracting Parties shall specify the conditions for use of sludge in its different states (stabilized, treated, untreated) taking into consideration the proximity of sludge application to various types of human activities and civil structure facilities/natural features. To this aim, the Contracting Parties agree to formulate a common guideline.

10. In the event that limit values set in Tables 1 to 3 cannot be met, the Contracting Parties shall apply alternative means to agricultural use including incineration and regulated landfilling ensuring in both cases, that there is no negative impact on the environment (particularly for water sources) and human health, and that disposal of sewage sludge in coastal areas is prohibited.

11. The Contracting Parties shall apply adequate treatment processes to reduce volatile organic compounds and diminish possible odor emissions in the different stages of sludge treatment, transport and application in agriculture and other suitable uses.

III. Sewage sludge use and energy/nutrient recovery

12. The Contracting Parties shall establish the required infrastructure for the implementation of the requirements of the applicable measures of this Regional Plan with regards to the use for agricultural land applications and/or for energy/nutrient recovery at the latest by 2035.

IV. Considerations for reducing impacts of climate change

13. The Contracting Parties shall reduce energy costs and increase water savings during treatment by using BAT and applying BEP including the use of alternative and renewable energy sources based on advanced technologies such as anaerobic digestion, pyrolysis/gasification, mass burning and other technologies.

14. The Contracting Parties shall implement technologies targeting energy efficient treatment of sludge such as pretreatment of sludge, solar drying, bio-drying, composting, etc.

15. The Contracting Parties shall promote implementation of adaptation measures for climate change protection including:
    i. Taking advantage of the biosolids as an important source of nutrients and organic matter;
    ii. Using biosolids as soil amendment to combat desertification; improve infiltration of water (precipitation or irrigation water); ensure better drainage in high rainfall areas; and decrease surface water runoff;
    iii. Increasing on-site carbon sequestration potential.

V. Monitoring

16. The Contracting Parties shall take measures to ensure monitoring of the quality of sewage sludge in the WWTP or after treatment outside the WWTP, whichever constitutes the last treatment process before use, with the aim of determining sludge class as provided for in Article V of this Regional Plan, and accordingly, to select the adequate monitoring programmes to the extent possible as indicated in Table 4 on the frequency of monitoring for pollutants, pathogen densities, and vector attraction reduction in sewage sludge. To this aim, the Contracting Parties collaborate to formulate common agreed technical guidelines on routine monitoring of treated sewage sludge.

Table 4: Frequency of monitoring for pollutants, pathogen densities, and vector attraction reduction in Sewage Sludge

Amount of biosolids (dry matter) **Tons per 365-day period**	**Tons per day**	**Frequency**
> 0 to < 290	> 0 to < 0.80	Once per year
≥ 290 to < 1,500	≥ 0.80 to < 4.10	Once per quarter (4 times per year)
≥ 1,500 to < 15,000	≥ 4.10 to < 41	Once per 60 days (6 times per year)
≥ 15,000	≥ 41	Once per month (12 times per year)

ARTICLE VI
Technical Assistance, Transfer of Technology and Capacity Building

17. For the purpose of facilitating the effective implementation of the measures and monitoring obligations under Article V of this Regional Plan, the Contracting Parties are urged to consider the techniques provided for in this Plan and to exchange and share best practices directly or with the support of the Secretariat including BAT, BEP, sustainable consumption and production, circular economy, resource efficiency, WEFE Nexus in the design, construction, operation and maintenance of the urban wastewater treatment plants.

ARTICLE VII
Timetable for Implementation

18. The Contracting Parties shall implement the measures included in this Regional Plan as per the timelines associated with these measures.

ARTICLE VIII
Reporting

19. The Contracting Parties shall report on implementation of measures stipulated in this Regional Plan in line with the reporting requirement and timelines provided in Article 26 of the Convention and Article 13, paragraph 2(d) of the LBS Protocol.

ARTICLE IX
Entry into Force

20. The present Regional Plan shall enter into force and become binding on the 180th day following the day of notification by the Secretariat in accordance with Article 15, paragraphs 3 and 4, of the LBS Protocol.

Annex IV

Work plan with timetable for the implementation of Articles of the Regional Plan on Sewage Sludge Management

Related Article (Paragraph)	Key pollution prevention measures for implementation in the Regional Plan for Sewage Sludge Management	Proposed target year for implementation of measures														
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Art. V (7)	Contracting Parties shall adopt Class A biosolids suitable for use as fertilizer for agricultural crops having met the pathogen reduction requirements set in Table 1 by treatment processes															
Art. V (8)	Contacting Parties shall adopt limit values for heavy metals to ensure that use would not affect human health and the environment as provided for in Table 2 (heavy metals in biosolids) and Table 3 (heavy metals in soil)															
Art. V (12)	Contracting Parties shall establish the required infrastructure for the implementation of the requirements of the applicable measures of this Regional Plan with regards to the use for agricultural land applications and/or for energy/nutrient recovery															

Related Article (Paragraph)	Other measures that the Contracting Parties legally commit to undertake as per the Regional Plan with no specific deadlines
Art. V (7)	Set classes for sludge with limit values for pathogen contents for biosolids to ensure that use would not affect human health and the environment
Art. V (7)	Consider adopting Class B biosolids suitable for use as fertilizer for non-food crops having met the pathogen reduction requirements set in Table 1 by treatment processes
Art. V (9)	Specify the conditions for use of sludge in its different states (stabilized, treated, untreated) taking into consideration the proximity of sludge application to various types of human activities and civil structure facilities/natural features
Art. V (10)	In the event that limit values set in Tables 1 to 3 (pathogens and heavy metals in biosolids and soil) cannot be met, the Contracting Parties shall apply alternative means to agricultural use including incineration and regulated landfilling
Art. V (11)	Apply adequate treatment processes to reduce volatile organic compounds and diminish possible odor emissions in the different stages of sludge treatment, transport and application in agriculture and other suitable uses
Art. V (13)	Reduce energy costs and increase water savings during treatment by using BAT and applying BEP
Art. V (14)	Implement technologies targeting energy efficient treatment of sludge such as pretreatment of sludge, solar drying, bio-drying, composting, etc.
Art. V (15)	Promote implementation of adaptation measures for climate change protection
Art. V (16)	Take measures to ensure monitoring of the quality of sewage sludge in the WWTP or after treatment outside the WWTP
Art. VI (17)	Exchange and share best practices directly or with the support of the Secretariat including BAT, BEP, sustainable consumption and production, circular economy, resource efficiency, WEFE Nexus in the design, construction, operation and maintenance of the urban wastewater treatment plants
Art. VIII (19)	Report on implementation of measures stipulated in this Regional Plan in line with the reporting requirement and timelines provided in Article 26 of the Convention and Article 13, paragraph 2(d) of the LBS Protocol