



New EU Regulation on Water Reuse

Isaac Fernández, CETIM

LIFE PHOENIX
LIFE19 ENV/ES/000278

Innovative cost-effective
multibarrier treatments for
reusing water for agricultural
irrigation



LIFE PHOENIX is a project co-funded by the European Union under the LIFE Programme Grant Agreement no. LIFE19 ENV/ES/000278

MOTIVATION

WHY?

Increased pressure on water resources.

World water crisis:
Scarcity, environmental impact,
draughts

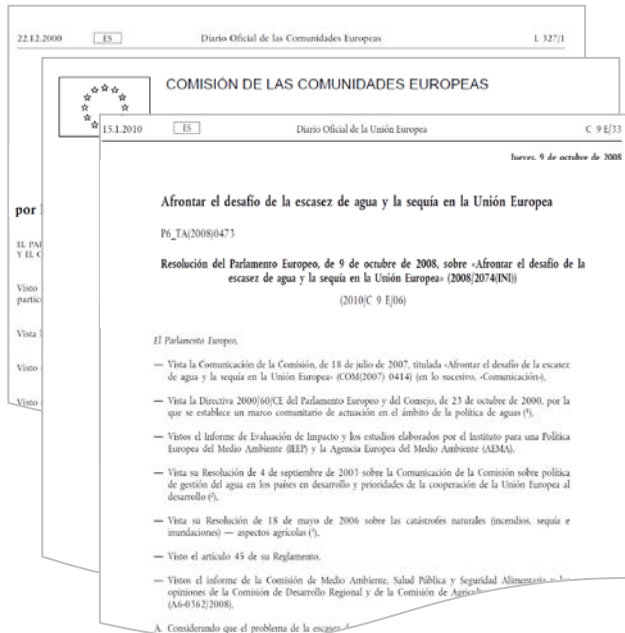


MOTIVATION

- Improve the EU's capacity to respond to pressures on water resources.



Water regeneration for reuse



Directive 2000/60/CE

- Reuse of water to achieve the objectives of good status of water bodies.

Communication from the Commission of 18 July 2007

- Additional water supply infrastructure.

EU Parliament Resolution of 9 October 2008

- Global approach to water resources management, optimising resources and creating new ones.

MOTIVATION

- Improve the EU's capacity to respond to pressures on water resources.



Water regeneration for reuse



Commission Communication of 14 November 2012

- Regulation and harmonisation of EU states standards for water re-use.

Communication from the Commission of 2 December 2015

- Adopting measures to promote the reuse of treated water.

WATER REUSE



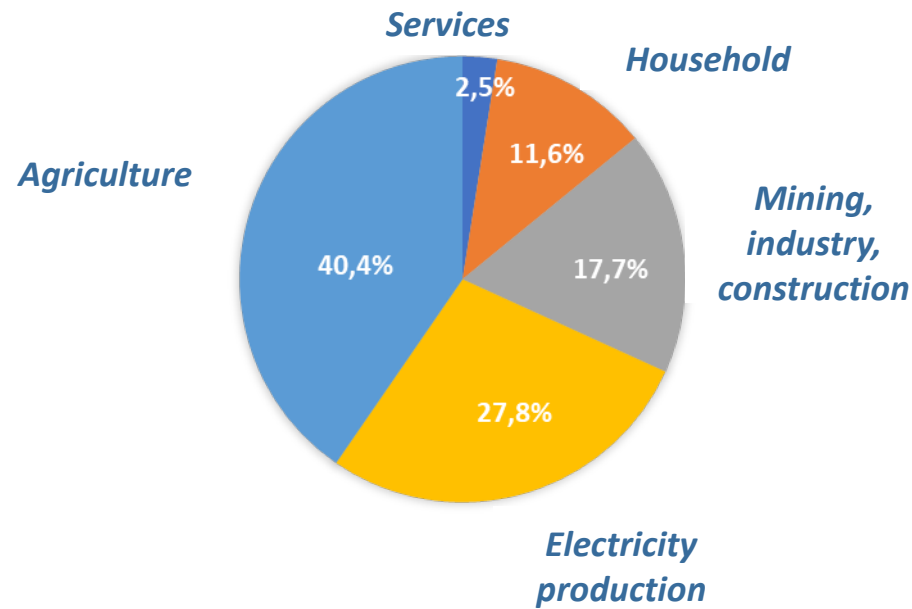
Reuse of treated water has a lower environmental impact than alternative methods of water supply: water transfer or desalination.

Limited practice in the EU due to:

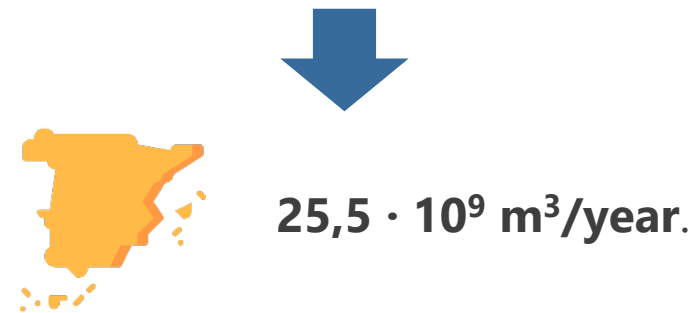
- Cost of water reclamation systems.
- Lack of environmental and health standards & regulations.



BENEFITS IN AGRICULTURE



In Europe, agriculture consumes more than 40% of water¹.



¹ Water use in Europe- EEA 2018

AIM & PURPOSE

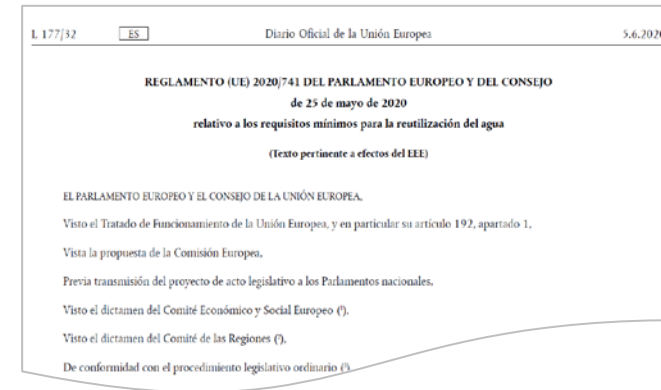
Aim

Establishes minimum water quality and monitoring requirements and risk management provisions for the safe use of reclaimed water in the context of integrated water management.

Purpose

Ensure that reclaimed water is safe for agricultural irrigation, ensuring a high level of protection of the environment, human and animal health.

- Promote the circular water economy.
- Support climate change adaptation.
- Contribute to the objectives of the Directive 2000/60/CE.



DEFINITIONS



Urban Wastewater:

Domestic waste water or the mixing of domestic waste water with industrial waste water and/or storm water run-off.



Reclaimed water:

Urban waste water which has been treated in compliance with the requirements of Directive 91/271/EEC and which results from further treatment in a water reclamation plant.



Water reclamation plant:

A WWTP or other installation for the further treatment of urban waste water meeting the requirements of Directive 91/271/EEC to produce water suitable for reuse.

SCOPE OF APPLICATION



European Union.

- Entry into force: **june 2020**
- Implemented: **june 2023**

Re-use of treated water for agricultural irrigation.



Crops to be consumed raw



Crops to be consumed processed



Non-food crops

OBLIGATIONS



Operator

To warrantee:

- **Minimum quality.**
- Any other condition established by the regulators.



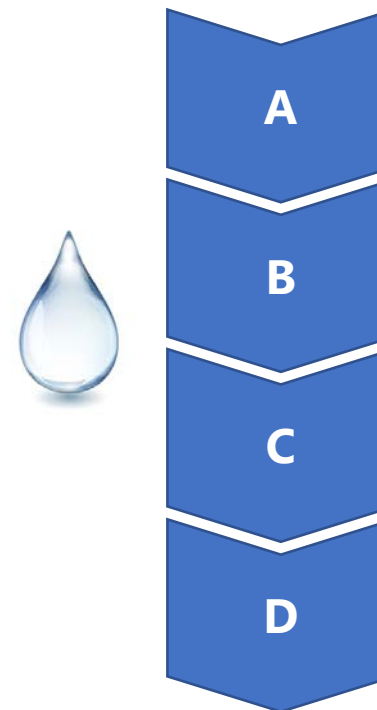
Permission

- Based on reclaimed water **risk management**:
 - Quality class(es).
 - Place of use.
 - Estimated annual volume.
 - Conditions relating to minimum and additional requirements.
 - Period of validity.
 - Point of compliance.

MINIMUM REQUIREMENTS

- Definition of **minimum requirements** according to water quality class.
- Minimum **frequency** of routine **monitoring**
- **Validation control** characteristics.

Quality class



MINIMUM REQUIREMENTS

A Class

- **Food crops consumed raw** where the **edible part is in contact** with reclaimed water.
- **Raw consumed tubers.**

Once per week		
<i>E. coli</i> (CFU/100 mL)	BOD ₅ (mg/L)	TSS (mg/L)
≤ 10	≤ 10	≤ 10
Turbidity (NTU)	<i>Legionella</i> <i>spp.</i> (CFU/L)	Nematodes (egg/L)
≤ 5	≤ 1000	≤ 1
Continuous		Twice per week

MINIMUM REQUIREMENTS

B Class

- **Food crops consumed raw** where the **edible part** is produced **above ground** level and is **not in direct contact with reclaimed water**.
- **Processed food crops**.
- **Non-food crops**, including crops used to feed dairy and meat producing animals.

C Class

↓
All irrigation methods

↓
Drip irrigation

MINIMUM REQUIREMENTS

	<i>E. coli</i> (CFU/100 mL)	BOD ₅ (mg/L)	TSS (mg/L)	Turbidity (NTU)	<i>Legionella spp.</i> (CFU/L)	Nematodes (egg/L)
B	≤ 100	≤ 25	≤ 35 (> 10000 e-h)	-	≤ 1000	≤ 1
C	≤ 1000		≤ 60 (2000-10000 e-h)			

Once per week (applies to *E. coli* and *Legionella spp.*)
Twice per month (applies to *E. coli*)
Once per month (applies to BOD₅, TSS, and Nematodes)
Twice per month (applies to *Legionella spp.* and Nematodes)

MINIMUM REQUIREMENTS

D Class

- Crops for industry, energy and seed production.

Twice per month		Once per month
<i>E. coli</i> (CFU/100 mL)	BOD ₅ (mg/L)	TSS (mg/L)
≤ 10000	≤ 25	≤ 35 (> 10000 e-h) ≤ 60 (2000-10000 e-h)
Turbidity (NTU)	<i>Legionella</i> <i>spp.</i> (CFU/L)	Nematodes (egg/L)
-	≤ 1000	≤ 1
		Twice per month

VALIDATION

- To be done before a new reclamation facility is put into operation.
- **Class A.**

Reclaimed water quality class	Indicator microorganisms (*)	Performance targets for the treatment chain (log ₁₀ reduction)
A	<i>E. coli</i>	≥ 5,0
	Total coliphages/F-specific coliphages/somatic coliphages/coliphages (**)	≥ 6,0
	<i>Clostridium perfringens</i> spores/spore-forming sulfate-reducing bacteria (***)	≥ 4,0 (in case of <i>Clostridium perfringens</i> spores) ≥ 5,0 (in case of spore-forming sulfate-reducing bacteria)

(*) The reference pathogens *Campylobacter*, Rotavirus and *Cryptosporidium* may also be used for validation monitoring purposes instead of the proposed indicator microorganisms. The following log₁₀ reduction performance targets shall then apply: *Campylobacter* (≥ 5,0), Rotavirus (≥ 6,0) and *Cryptosporidium* (≥ 5,0).

(**) Total coliphages is selected as the most appropriate viral indicator. However, if analysis of total coliphages is not feasible, at least one of them (F-specific or somatic coliphages) shall be analysed.

(***) *Clostridium perfringens* spores is selected as the most appropriate protozoa indicator. However, spore-forming sulfate-reducing bacteria are an alternative if the concentration of *Clostridium perfringens* spores does not make it possible to validate the requested log₁₀ removal.

RISK MANAGEMENT

Risk management includes proactive risk identification and management, ensuring that reclaimed water is used and managed safely and that there is no risk to the environment, human or animal health..

- Description of the overall system.
- Identification of the parties involved in the system.
- Identification of potential hazardous agents.
- Assessment of the risks to the environment, human and animal health.
- Conditions relating to additional requirements.
- Preventive measures.

EU REGULATION 2020/741 vs. R. D. 1620/2007

Regulation EU 2020/741



R.D. (ES) 1620/2007

- Reuse in agricultural irrigation.
- Stricter minimum requirements.
- More comprehensive turbidity monitoring frequency.

- Reuse in agricultural irrigation, urban uses, industrial uses, recreational and environmental uses.
- Takes into account environmental quality standards for hazardous substances.

	<i>E. coli</i> (CFU/100 mL)	BOD ₅ (mg/L)	TSS (mg/L)	Turbidity (NTU)	<i>Legionella spp.</i> (CFU/L)	Nematode (egg/L)
EU Regulation 2020/741 A Class	≤ 10	≤ 10	≤ 10	≤ 5	≤ 1000	≤ 1
R.D. 1620/2007 Quality 2.1	≤ 100	-	≤ 20	≤ 10	≤ 1000	≤ 0.1

CONCLUSIONS AND PERSPECTIVES

- Establishes a common legal framework for Member States encouraging the agricultural reuse of water.
- Ensures the protection of the environment, human and animal health, including risk management.
- Promotes the sustainable use of water.
- Increases technical and scientific knowledge for a future extension of the scope of reclaimed water.
- Non-agricultural uses not covered.
- May increase cost of water regeneration.
- Some existing regeneration plants may need refurbishment to fulfill the more stringent requirements.



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