

# The European Commission's science and knowledge service

Joint Research Centre

## Water Safety and Security Brussels, 11<sup>th</sup>-12<sup>th</sup> December 2016

**"SYNTHESIS OF EXISTING LEGISLATION AND CURRENT ACTIVITIES RELATED TO DRINKING WATER SAFETY AND MONITORING"**

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## International, European and National standards

### ☐ International standard ISO/TC 147

- ✓ Dedicated to water quality
- ✓ Includes definition of terms, sampling of waters, measurement ...
- ✓ Divided into 6 parts including:
  - ISO/TC 147/SC 2: Physical, chemical and biochemical methods
  - ISO/TC 147/SC 3: Radioactivity measurements
  - ISO/TC 147/SC 4: Microbiological methods
  - ISO/TC 147/SC 5: Biological methods (mainly focusing on toxicity)



### ☐ European standard CEN/TC 164

- ✓ Dedicated to water supply (installation and performance requirements of systems used for the water supply from the production facility to the tap)
- ✓ 11 working groups, including the CEN/TC 164/WG 15 which is in charge of the security of the drinking water supply
  - Guidelines for crisis management (part 1)
  - Risk management (part 2)



### ☐ French standard NF X52-120

- ✓ Voluntary standard is an assessment methodology of detection techniques for identifying biological pathogens



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## European Directives



### ❑ Drinking Water Directive 98/83/EC (DWD)

This Directive indicates that Member States shall take all measures necessary to ensure :

- ✓ regular monitoring of the quality of water
  - ✓ only 3 categories of microorganisms: *E. coli*, *Enterococci* and *Pseudomonas aeruginosa*
  - ✓ counting is recommended (which is time-consuming)
- *Revision of the DWD: risk assessment/management approach + no recommendation for routine analysis for pathogens*

### ❑ Water Framework Directive 2000/60/EC (WFD)

- ✓ protection of inland surface waters (rivers, lakes, transitional water and coastal waters) and groundwater → not drinking water
- ✓ Neither nominative nor quantitative information related to pathogenic microorganisms

### ❑ Groundwater Directive 2006/118/EC (GWD)

- ✓ Annex II (part B): list of pollutants and their indicators with threshold values (arsenic, cadmium, lead, mercury, ammonium chloride, ... → **No pathogens**)

### ❑ Environmental Quality Standards Directive 2008/105/EC (EQS)

- ✓ Annex I: limits on concentrations of 33 priority substances + 8 other pollutants (chemicals, plant protection products, biocides, metals) → no biological pathogens

### ❑ Bathing Water Directive 2006/7/EC (WBD)



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## European organisations



**WISE** : Water Information System for Europe provides a web-portal entry to water related information

- DG Environment / JRC / Eurostat

→ biological contamination in drinking water doesn't seem to be a concern handled by WISE



**EurEau** : National associations from 26 EU countries

- promotes the common interests of drinking water and waste water service operators

→ to advise the major European institutions, member state governments, and regulators

**EIP Water** : European Innovation Partnership



- facilitates the development of innovative solutions
- supports the creation of market opportunities for these innovations via the establishment of Action groups: **RTWQM** - Real Time Water Quality Monitoring
- AugMent** - Water Monitoring for Decision Support



**WssTP** : Water Supply and Sanitation Technology Platform

- Research and Technology Development in the water industry
- European Technology Platform (ETP)



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## Links with European programmes

### Water-JPI (Joint Programming Initiatives)

- ✓ 19 partner countries + European Commission + 5 observer countries
  - Strategic Research and Innovation Agenda to point out the priorities
  - Implementation Plan (2014-2016)
- ✓ suggested 10 topics for inclusion in H2020 (Work Programme 2016-2017) and initiated:
  - 1<sup>st</sup> joint call on "Emerging water contaminants - anthropogenic pollutants and pathogens"
  - 2<sup>nd</sup> joint call on the topic "Research and Innovation for Developing Technological Solutions and Services"



### European projects

- ✓ FP7: SAFEWATER, AQUAVALENS, SecurEau ...
- ✓ H2020: Aqua SHIELD, ANSWER, BEEP-WATER, BIWAS, FREEWAT ...



### Bilateral projects

- ✓ ResiWater: Franco-German (2015) → aims at improving the Water Distribution Systems security and resilience
- ✓ SWAN: Sustainable Water ActioN, 4 year cooperation project between EU and US granted by the European Commission (FP7)



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## International régulations: WHO



### Guidelines for Drinking-water Quality (WHO)

- 1- Biological contaminations** provide general information on pathogens that are of relevance for drinking-water supply management
  - the indicator organism of choice for faecal pollution is *E. coli* (detection methods are reported)
  - other microbial hazards may be of public health importance under specific circumstances (protozoa and some enteroviruses, enterococci, (spores of) *Clostridium perfringens* and bacteriophages, ...)
- 2- Risk Assessment approach**
  - QMRA (Quantitative Microbial Risk Assessment): mathematical modelling to estimate the effects of low doses of pathogens in drinking-water on populations (problems related to QMRA are reported)
- 3- Water Safety Plan (WSP)**
  - development of management plans to describe actions taken under both normal and incident conditions  
→ WSP manual available: "Step-by-step risk management for drinking-water suppliers"



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## International regulations: US (SDWA)



### SDWA: Safe Drinking Water Act

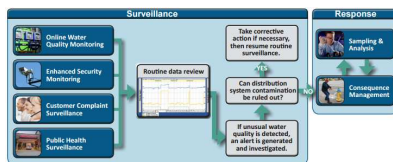
EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers for implementation

#### ✓ Analytical method procedures

#### ✓ Science and technology

- **Contaminants of Emerging Concern**
- **Monitoring and Assessing Water Quality:** Water quality data are stored and used to characterize waters in US
- **Research** (Microbial (and chemical) risk research) → Newsletter
- **Risk assessment:** development of a software to assist utilities owners and operators in understanding and assessing potential climate change (CREAT, Climate Resilience Evaluation and Awareness Tool)

#### ✓ Homeland Security: water and wastewater



- to conduct a risk assessment
- to develop emergency response plans → Water and Wastewater Agency Response Network (WARN)
- to develop a Water Utility Training and Exercise Plan
- to implement a Surveillance and Response Systems (SRS) for Distribution System Monitoring and Management

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## International regulations: Australia



### Australian Drinking Water Guidelines (ADWG)

✓ very complete guidelines and fact sheets (more than 1300 pages) based on:

- 12 elements such as operational procedures and process control, management of incidents and emergencies, research and development ...
- risk assessment and preventive measures
- a National Plan For Water Security (modernising irrigation, upgrading water information)

Waterborne pathogens reported - example for bacteria:

- excreted pathogens: *Salmonella spp.*, *Shigella spp.*, enterovirulent *E. coli*, *Vibrio cholera*, *Yersinia enterocolitica*, *Campylobacter jejuni* and *E. coli*.
- pathogens growing in water supplies: *Pseudomonas aeruginosa*, species of *Klebsiella* and *Aeromonas*, and certain slow-growing *mycobacteria*
- *Legionella pneumophila* (inducing serious illness resulting from inhalation of water)

→ Very detailed fact sheets are available (one per microorganism) BUT only the monitoring for *E. coli* within the distribution system is indicated (no *E. coli* in a minimum of 100 mL)

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## Conclusion

- ★ There are EU and International Standards/directives/guidelines
- ★ There are key EU organisations
- ★ There are scientific EU projects



Thank you for your attention !

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