



# ERNCIP THEMATIC GROUP: CHEMICAL & BIOLOGICAL RISKS TO DRINKING WATER

**Workshop: Protecting Critical Infrastructures and addressing  
Disaster Resilience in Horizon 2020**

**Vienna  
February 22<sup>nd</sup>, 2016**





# The TG Water (active since April 2012)

Current participants of the group

- **Environment Agency Austria** (co-ordination)
- Austrian Agency for Health and Food Safety **AGES (AT)**
- **S:CAN (AT)**
- **CEA SBTN** Marcoule, Bagnols-sur-Cèze (**FR**)
- **University de Lorraine** - Nancy (**FR**)
- **Lyonnaise des Eaux (FR)**
- **Fraunhofer-IOSB and IGB (DE)**
- **Robert Koch Institute (DE)**
- **ICRA Catalunya (ES)**
- **CETAQUA (ES)**
- **Aigües de Barcelona (ES)**
- **Water Research Centre plc (UK)**
  
- **Voluntary membership – signed commitment**

# Incidents

## Nokia (Finland, 2007)

- Accidental waste water discharge into drinking water network
- Stealth contamination
- Human factor? Recognition of problem?

Human  
factor

## Baia Mare (Romania, 2000)

- Tons of cyanide spilled into Tisza River and Danube
- High and immediate impact
- Availability of huge amounts of toxic materials?

Extreme  
weather,  
Availability  
toxic material

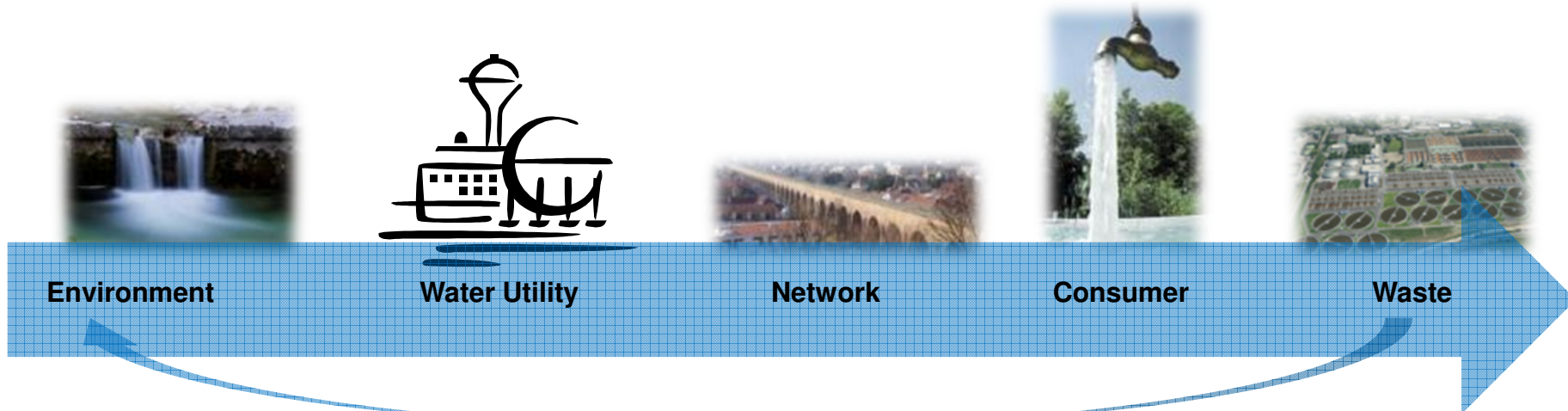
## Hochsauerland (Germany, 2006)

- Contaminated agricultural area
- PFOS in drinking water

Control  
?

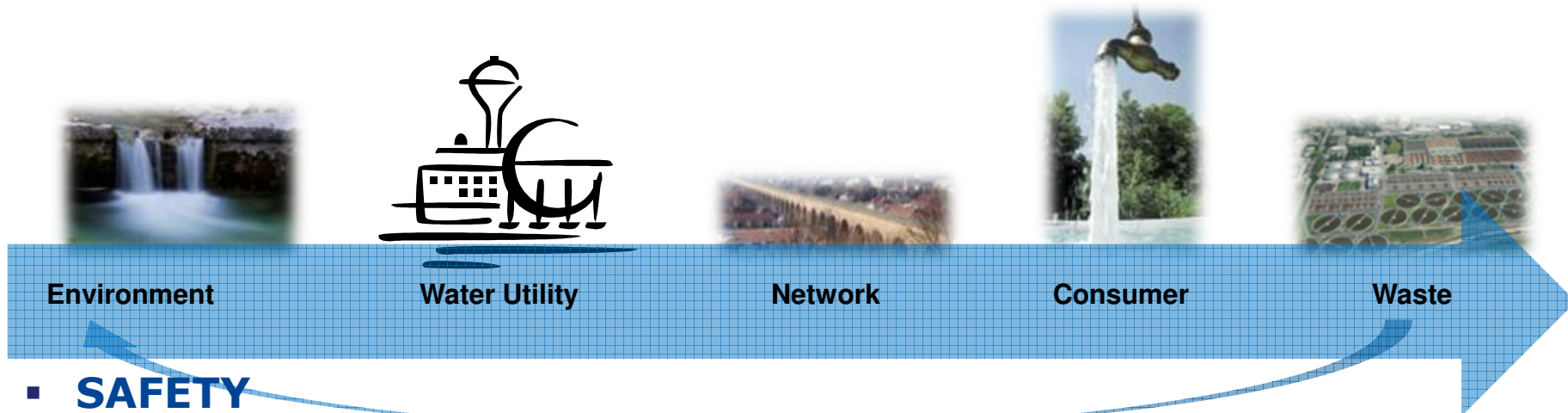


## Line of Action



- **Different legal frameworks (Drinking Water Directive, Water Framework Directive,...)**
  - Different degrees of protection
  - Guidelines - risk levels, scenarios
- **Utility has an individual degree of vulnerability**
  - Environment – ground water, surface water, industry, infrastructure...
  - Distribution network
- **Recognition of a contamination?**

# Safety and Security Methods



- **SAFETY**

- Monitoring as requested by legislation
  - Weak measure to identify quickly changing compositions or contamination with hazards not being monitored

- **SECURITY**

- Online monitoring
  - Event detection
  - Early warning
  - Limitation of non compliance with legal frameworks (DWD etc)
- Rapid response analytical screening
  - targeted/non targeted laboratory analysis

## Resilience

- **Early warning systems** – alert the operator upon change of water quality
- Highly sophisticated **analytical procedures** and collaboration  
**AQUASEC-AUT**, Austrian KIRAS security research fund, crisis intervention laboratory

In most cases, a combination of these two lines will be needed

Detection of a contamination

Identification by accelerated analytical procedures

## TG outputs - State of the art reports

State-of-the-art of screening methods for the rapid identification of chemicals in drinking water Deliverable D1 (Llorca, M., Rodriguez, S., JRC 83768)

Review of sensors to monitor water quality. ERNCIP thematic area Chemical & Biological Risks in the Water Sector. Deliverable 1 - Task 1 (Raich, J., JRC 85442)

Review of **methods for the rapid identification of pathogens** in water samples - ERNCIP thematic area Chemical & Biological Risks in the Water Sector - Task 7, deliverable 1 (Tanchou, V., JRC 92395)

Review of **monitoring techniques for biological contaminants**. ERNCIP thematic area Chemical & Biological Risks in the Water Sector Deliverable 2 – Task 2 (Hufnagl, P., JRC 88228)

Workshop on Early Warning Systems - ERNCIP thematic area Chemical & Biological Risks in the Water Sector - Task 5, deliverable 1 (Hohenblum, P., JRC 94436)



# Early Warning Systems Workshop

Workshop on 26 June 2014

## Aim:

- Present results of three reports and get feedback
- What are needs of operators in terms of security monitoring?
- What would facilitate applying early warning systems (EWS) in the future?
- How would a certain degree of standardization of EWS help?
- Bring together operators, manufacturers, research – balance needs and capabilities

22 participants





## Early warning systems Workshop

Workshop supported by questionnaire

- Addressed to drinking water utilities

Driving questions

- To which extent are sensors/early warning systems established at water utilities?
- Which are the reasons for installing early warning systems?
- Which are the reasons for NOT installing early warning systems?
- Do installed systems fulfil expectations?
- To which extent are security aspects covered in water utilities management?

Provision of the questionnaire online in the following official languages:

- English, German, French, Spanish, Italian, Romanian

## Workshop Conclusions

- Benefit to the operator – powerful tool
- Most sensors and EWS components have not been tested/verified by third party – utilities will require verification and demonstration studies to sort through manufacturer's claims
- Poor links between available sensor technologies and water quality regulations
- Event detection systems need to be easy to use
  - software assistance – large data amounts
- Low cost applications
  - Costs are reported as major reason for not installing systems
  - Price vs. Market – size of utility

## Early Warning Systems

Building on the results of state-of-the-art-reports and the EWS Workshop in June 2014

Further focus is laid on

- Early Warning Systems
- Event Detection Systems
- Real Time Monitoring



Ref.: S:CAN



## Proposed Work Programme 2016

Identification of requirements for harmonization of real time monitoring systems

Scoping basic elements of real time monitoring systems as part of water security plan

Technical parameters (reproducibility, repeatability), thresholds etc. to take into account

- Natural variations of blended water
- Chemical parameters as surrogate for biological contamination
- Software requirements (huge amount of data to be processed)
- Maintenance
- Validation of systems

## Water Security Plan

A new term in the landscape

- existing water safety plans concern product safety
- Several fragmented guidelines and protocols on water security issues focus on vulnerabilities
- A logical sequence of actions shall raise awareness towards water security and shall help to structure a coherent approach to control security by means of water safety

## Proposed output 2016

- Survey report
  - criteria for sensors
  - Data which need to be provided to the analysis system
- Draft proposal for the harmonization or standardization of real-time monitoring systems to CB threat to drinking water
  - Bases on the consultation and questionnaire results
- Workshop to validate results
  - Need for harmonization or standardization for real time monitoring systems
  - Identification of the elements needed to prepare the appropriate process in subsequent work

## Networking

- Information platform – to take stock of other relevant EU-level projects
- Bring together and exchange with relevant research groups - “fight fragmentation”
  - E.g. SLAM, EQuATOX, Smart Water for Europe, Safewater, ISIS and Tawara
- EU projects represented in group:
  - SECUREAU
  - SAFEWATER
  - AQUAVALENS
- Organization of Workshops
  - Seeking collaboration, finding new team members
  - EIP AG RTWQM @ meeting on February 24<sup>th</sup> and 25<sup>th</sup>





# Thank you!

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