

# Optimisation of sewerage systems for the protection of receiving water bodies

Bordeaux, France, 19-20 March 2014

Treating wastewater before it reaches the receiving environment is a regulatory requirement across Europe since 1991 (**Council Directive 91/271/EEC, concerning urban wastewater treatment, Water Framework Directive 2000/60/EC**). This requirement was driven by both public health and environmental protection concerns that needed to be resolved.

This action is performed by centralized treatment plants, towards which are routed most of the effluents collected in an area which very often covers an entire city. Nevertheless, the global performance of a sewerage system does not only depend on the treatment plants but relies on the sewer collection systems themselves as well as on the individual septic systems if any. Therefore these systems must be designed, built, rehabilitated, and operated as technical components participating to the overall treatment performance.

The majority of the sewer collection systems in Europe are combined for a large part, which means that they were designed to collect and route both wastewater and stormwater to the wastewater treatment plant in order to be treated. Sometimes, the capacity of the sewers is exceeded during a rainfall event. Therefore, to preserve the efficiency of the treatment as well as to protect the population from flooding, untreated wastewater may be discharged into the environment at different locations before it reaches the treatment plant (combined sewer overflows). In order to manage the priorities between maximizing the efficiency of the overall treatment and preventing the cities from flooding, the European Standard EN 752 « Drain and sewer systems outside buildings » sets different levels of service depending on the location of the sewer system as well as on the occurrence and intensity of rainfall events.

We propose during this conference to review the different techniques and methods that have been developed to optimize the use of the existing collection systems, possibly along with the construction of new facilities or systems to maximize the overall performance of the sewerage system for situations where the reduction of the combined sewer overflows is a priority. It therefore targets any event going from dry weather to moderate rainfalls. Nevertheless, the proposed solutions must not jeopardize the safety of people and properties during the most intense rainfall events.

The solutions developed may consist in implementing local (at the scale of a facility) or global (at the scale of the sewer system) real time control strategies. It may also consist of static strategies to optimize the inputs and outputs of the sewer system.

A particular attention will be given to the models and optimization methods implemented, to the explanation of the evaluation and optimization criteria, to the prioritization of the objectives. The reliability of the proposed or implemented solutions may be subject to specific developments, and address topics such as forecasting rainfall events, probabilistic modeling, identification of scenarios, the reliability of sensors and actuators, fall-back strategies, etc.



## The main topics covered will be:

### Evaluation and optimization criteria

- technical
- economic
- regulatory

### Control of the inputs

- Sustainable Urban Drainage Systems (SUDS) / Green Infrastructure
- infiltration and inflow (I/I) reduction
- quality control of the discharges into the sewer networks



### Local optimization of transport/transfer

- Sewer networks and pumping stations
- Combined sewers and Combined Sewer Overflow structures
- Management of storage and restitution capacities

### Decentralized treatments (more or less sophisticated)

- Extensive
- Intensive

### SCADA systems, global and predictive management

- Rainfall forecast
- Off-line simulations, scenarios
- Real-time optimization
- Risk management/robustness



### Actuators and sensors

- Technological innovations
- feedback studies

## deadlines:

- ✓ Abstract submission: **June 17<sup>th</sup>, 2013**
- ✓ Abstract acceptance: September 13<sup>th</sup>, 2013
- ✓ Full paper submission: **october 31st, 2013**
- ✓ Referee comments for full papers returned to authors : december 13th, 2013
  - ✓ Final “camera ready” paper: **January 30th, 2014 (Impérative)**

### Scientific Committee

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